THE FIRST 50 YEARS

1969-2019
Land Acknowledgement. The University of Waterloo acknowledges that we are on the traditional territory of the Neutral, Anishnawbe and Haudenosaunee peoples. The University of Waterloo is situated on the Haldimand Tract, the land promised to the Six Nations that includes six miles on each side of the Grand River.

The Faculty of Environment is very excited to celebrate 50 years at the University of Waterloo. We look to the future …
I first visited University of Waterloo campus as a Grade 13 student in the early 1970s. What I most remember was the mainframe computer in the Math and Computer building, and I don’t recall that our structured day brought me anywhere near the Faculty of Environment. I chose to study elsewhere – for my undergrad and Masters – but then returned to Waterloo’s campus in 1983 for an interview with Professor Len Guelke, Graduate Officer in Geography, with regards to my application for doctoral studies in Geography. At the end of the meeting, I learned that I had been accepted; and I left the second floor of EV1 in such a state of excitement that I sprinted around the ring road for sheer joy. I have experienced joy in every role that I have played on campus since, and I am so proud of the sense of purpose and record of achievement that our family of Environment alumni, students, staff, faculty, retirees, and friends share.

But the world needs us more than ever. So, as we celebrate our first 50 years, let us not be bound by our past. As others have said, “What got us here, won’t take us there.” So let’s continue to be bold in our vision, open in our approach, and willing to change ourselves and our world.

Sincerely,

Jean André
Dean, Faculty of Environment
When Dean Jean Andrey first asked me if I would take on writing the history of the Faculty of Environment, I scrunched up my face and thought, no way. I was two years retired and if I was going to write anything it would be fiction. Of course I had been writing fiction for years in the form of grant applications but I meant I wanted to write stories. The history of the Faculty seemed too much like the kind of work from which I had superannuated.

Then I got to thinking about what my old mentor at Western University, the great playwright and poet Jamie Reaney, once told me: “the university,” he said, “is a great patron.” We are coming up on the 50th anniversary of the Faculty and I have been part of it for over half of those years. The University and Faculty have been wonderful patrons, supporting me in my calling, providing the freedom and access to funds that have allowed me to make what I hope has been a significant contribution in my fields of study. I realized what an honour it was to be asked to do this sort of project and I understand how much trust my colleagues are willing to place in me given that I could say anything I want about them. In the end, I responded positively to Dean Andrey’s invitation and patience.

We decided that an editorial committee, a body to guide and review the results of the editor’s work, would be a good idea. I specifically requested the involvement of people with long experience, high academic and grammatical standards and unshakable integrity. Jean approached Gordon Nelson, Barbara Yeaman and Bob Gibson and all agreed to participate. The first order of business was to craft an outline and in that regard the committee opted for a thematic rather than a strictly chronological approach. Six themes emerged and the final product has six chapters. Because themes tend to overlap there may be instances where certain details are repeated. For that, I apologize.

Second, the group generated an ambitious list of current and past faculty, students, staff and alumni to be interviewed. The list ended up including 33 respondents. Most of those interviews along with copious other research was undertaken by a capable and enthusiastic research assistant, Jespal Panesar, a PhD student intern hired by the Deans’ Office. We decided to summarize rather than transcribe the interviews and those summaries were returned to the interviewees for verification. The project team was rounded out by contributions from Maryam Latifpoor-Keparoutis and Sam Toman.

From the beginning, I was hopeful that unlike many similar projects the research material collected here would not end up in a box on a shelf or worse, thrown out. I wanted to make sure that the summaries of our interviews, related documents such as meeting minutes, brochures, reports and so on, would be as readily available as the main text in some form or other.

When you set out to write something you have to decide what approach to adopt. You also have to decide on the voice, how it will sound. In the case of this project, I have called myself the “editor” because the idea was always to collect the stories of many people and to weave those stories into a single fabric. In that sense I have acted as editor. In terms
of voice, however, I found it impossible, because of my long, personal and passionate involvement in the Faculty, to speak any other way than in the first person. For that I am unapologetic. The master narrative, therefore, is the story of the Faculty as told by me and including the recollections of many others and my interpretation of historical material. There are few references to written sources and while I indicated that we have tried to include the original texts as appendices along with the summaries of interviews, this work has no scholarly pretensions. Citations are not the order of the day.

I have played fast and loose with the terms Faculty of Environment, Geography, Architecture and with all the acronyms FES, ERS, GEM, ENV and so on. Except when the reference was to a specific name change or where the name reference had specific importance, I used the terms interchangeably for stylistic variation. To ameliorate this issue I have provided a List of Acronyms. I don’t believe there are any cases where the use of terms is misleading.

With regard to names, I have tried to use the person’s proper title when they are first introduced so that Professor Bruce Mitchell gets to be Distinguished Emeritus at least once. After that it is either the title or degree or just last name unless I know the person in which case I may lapse into affectionately using their first name.

At some point in this sort of document it is considered proper form to acknowledge the First Nations whose land, through their generosity, we settlers share. Since the Faculty operates over the entire country of Canada and beyond that list would be preventatively long. Besides, I have begun to think that there is certain disingenuousness about the land acknowledgement by settlers. As one of my Indigenous friends points out, it is a bit like stealing someone’s car then driving by their house occasionally to tell them that the car is still running well. Instead, I will wish that the Faculty of Environment will grow in being one of those places where respect for Indigenous rights and interests thrives, and where a genuine Indigenous Peoples inspired respect and reverence for the environment lives and learns.

I have followed the APA Style Guide as closely as possible and have used Canadian Spelling.
# List of Acronyms:

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<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>ARCH</td>
<td>Architecture</td>
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<tr>
<td>BES</td>
<td>Bachelor of Environmental Studies</td>
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<td>CAFCE</td>
<td>Canadian Association for Co-operative Education</td>
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<td>CIGI</td>
<td>Centre for International Governance Innovation</td>
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<td>ENBUS</td>
<td>Environment and Business</td>
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<td>ENV</td>
<td>Faculty of Environment</td>
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<td>ERS</td>
<td>Environment and Resources Studies</td>
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<td>ES</td>
<td>Environmental Studies as in Faculty of Environmental Studies</td>
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<td>EV</td>
<td>Environment when referring to building as in EV1, EV2 and EV3</td>
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<td>FES</td>
<td>Faculty of Environmental Studies</td>
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<td>GEM</td>
<td>Geography and Environment Management</td>
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<td>GEOG</td>
<td>Geography</td>
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<td>IDRC</td>
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<td>KI</td>
<td>Knowledge Integration</td>
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<td>Kitchener-Waterloo</td>
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<td>LED</td>
<td>Local Economic Development</td>
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<td>MAD</td>
<td>Mapping Analysis and Design</td>
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<td>MAES</td>
<td>Master of Applied Environmental Studies</td>
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<td>MEDI</td>
<td>Master of Economic Development and Innovation</td>
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<td>MES</td>
<td>Master of Environmental Studies</td>
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<td>NSERC</td>
<td>Natural Science and Engineering Research Council</td>
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<td>PLAN</td>
<td>Planning, also School of Planning</td>
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<td>SEED</td>
<td>School of Environment, Enterprise and Development</td>
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<td>SERS</td>
<td>School of Environment, Resources and Sustainability</td>
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<td>SSHRC</td>
<td>Social Science and Humanities Research Council</td>
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<td>SURP</td>
<td>School of Urban and Regional Planning</td>
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<td>UNDP</td>
<td>United Nations Development Programs</td>
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<td>U of T</td>
<td>University of Toronto</td>
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<td>UWaterloo</td>
<td>University of Waterloo</td>
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<td>WLUI</td>
<td>Wilfrid Laurier University</td>
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<td>WICI</td>
<td>Waterloo Institute for Complexity and Innovation</td>
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<td>WISIR</td>
<td>Waterloo Institute for Social Innovation and Resilience</td>
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Chapter 1

Founding
The College of Environmental Studies

The sky over Waterloo, Ontario was a cloudless blue on February 20, 1969 and the temperature outside hovered around freezing. It was considerably hotter in Room E-1301. Now a student lounge in Engineering 2, E-1301 was the University’s Senate Chamber in the days before Needles Hall.

As will be explained in due course I was nowhere near Waterloo at the time. I didn’t arrive as a mature grad student until 1990. But I stayed, became a professor and now I am looking back over the years at the history of the Faculty that became my academic and professional home.

Some of the items on the agenda of that 1969 Senate meeting sound surprisingly, even alarmingly familiar to us. There was concern over the changing high school curriculum and how it might affect university admissions. It seems that many in the university didn’t really understand the changes. Another matter had to do with standardizing academic practices. For example, defining what exactly constituted a credit across the three non-professional faculties, Arts, Science and Math.

However, the main order of business that day was a motion to create the College of Environmental Studies. It is somewhat ironic, considering what happened over the following decades, that the first appearance of the term, “environmental studies,” at Waterloo was applied to the study of architecture, where graduates were to receive a Bachelor of Environmental Studies (BES).

The birth of Environmental Studies was not without the pain associated with the birth metaphor. There were concerns about whether it should be a College, Faculty or something else. There was debate about what components should be included: Architecture, Planning and a new unit called Man-Environment (a name that would be changed twice in the following years). Then there was the question of Geography, a natural for a College of Environmental Studies in many people’s minds but guarded by factions in the Arts Faculty who did not want a popular program moving out and taking its financial assets with it. As well, some voices were just plain against the recognition of the environment as a distinct field of inquiry.

The Senate meeting began at 2:10 p.m. and went until after 5 p.m. As I read the minutes I can feel the tension in the room and the strength of the emotions, dedication to ideals and understandable fears and apprehensions. Motions were countered by amendments that failed to win support; delicate matters were left unresolved and gaps in the minutes testify to the delicacy of questions about which we can only speculate. As the Duke of Wellington said after another Battle of Waterloo, it was a close-run thing.

The motion finally carried in time for the Senators to catch a late supper. There were refinements, further compromises and financial settlements before the Board of Governors accepted the Senate resolution at its June meeting.

In a way, therefore, one could count February 20, 1969 as the beginning of what is today known world wide as the Waterloo Faculty of Environment but that would be to over-simplify a much more complicated and colourful history. It was not just an exercise in organizational tinkering with a re-jigging of disciplinary alignments. It was not just the report of an ad hoc committee, a report we will examine later in this chapter. The creation of the Faculty of Environment was dendritic in its scope and form, a series of streams of inevitable consequences, intellectual ferment and revolution, flowing together into a single river.
Inevitable Consequences

When Ralph Krueger, the first head of Geography at Waterloo, set out to write the history of the Department, he remembered the words of the Waterloo’s first President, Gerry Hagey. Hagey said that timing is everything in the world of public affairs and universities. In order to understand the origins of the Faculty of Environment it is necessary to consider the times from which it sprang. The 1950s and 60s were tumultuous. Two horrendous wars and a shattering economic depression had dominated the first half of the twentieth century. A surge of visible economic prosperity ran through the 1950s but underlying the outward appearance was a human time bomb, the so called Baby Boom. The birth rate in western countries, and Canada more than any, soared. I was a charter member of the boom, which began in my birth year, 1948, and didn’t abate until about 1965. In his 1996 book, *Boom Bust & Echo*, U of T Professor David Foot argued that population changes are the real drivers of history.

Like many popular books written by academics it was hotly criticized but the thesis he presented did seem to explain much of what had happened in the 50s and 60s. Faced with large cohorts of children marching toward their birthright of education, governments scrambled to provide elementary and then secondary schools. The high school I went to, one of hundreds of new ones that sprang up like mushrooms across the country, wasn’t completed on time. We doubled up with another school, their student body starting classes in the dark at 7 a.m. and my school arriving at noon and going home in the gloom of early evening. Universities that didn’t even exist yet had hoards approaching.
The established, ivy encrusted halls at U of T, Western and Queen’s prepared to expand but not necessarily to change. In Waterloo County something different was taking shape. Here there would be something “of” the time and not in spite of it. Every great institution has its creation myth and Waterloo’s was unconventional, as Ken McLaughlin’s books describe, but also full of drama and heroes (Waterloo: The Unconventional Founding of an Unconventional University 1997 and Out of the Shadow of Orthodoxy: Waterloo@50 2007). The monikers of some of the protagonists are incised in the names of campus buildings – Gerry Hagey, Ira Needles, Carl Pollock – but to introduce the entire cast would be like trying to explain the plot-lines of Downton Abbey. I’ll spare the reader that but touch on the parts that were forerunners to the founding of Environmental Studies.

Students in front of the newly constructed Arts Lecture Building spell the name of one of Waterloo’s legendary founders, Gerald Hagey.

Two post secondary educational institutions existed in Waterloo County prior to World War Two: St Jerome's and Waterloo College. They were seminaries, originally concerned with the training of clergy, Catholic priests at St. Jerome’s and Lutheran pastors at Waterloo College. For Waterloo College there were two defining factors at work in the mid 1950s. One was a desire to grow and to begin offering broader education in the arts, and sciences. The second embodied the foresight of the community leaders who formed the Board of Governors of the College. These men, and I’m afraid they were all men then, realised that there would soon be a huge influx of young people hungry for learning. As the owners and managers of rubber, shoe and electrical appliance factories, they also knew that engineering and technical education was going to be vital.

This august group of community builders pursued the expansion of Waterloo College to include more science as well as arts and social science. They appointed one of their own as President of the College. Gerald Hagey had enjoyed a successful career with B.F. Goodrich Tire Company and moved smoothly into the College Presidency. But moving into the new office was the only easy part.

A cadre of new, young scholars, many from the United States, were hired and experienced practitioners from industry engaged to teach technical skills. However, as a church-affiliated institution Waterloo College was not eligible for operational or capital grants from the Provincial government. The solution was the creation of what they rather mysteriously called the “Waterloo College Associate Faculties.” Gerry Hagey became President of both and from that moment the tension began to build.
It soon became obvious that physical expansion was the only option if
the rapid increase in the student population was to be accommodated.
But the College had only limited access to land near what is now King
and University. In the matter of expansion two factions emerged, those
who favoured limited growth on or near the existing campus and those
who felt that additional and less expensive land should be acquired.
The expansion camp also had a not very well hidden agenda, the dream
of a large and non-denominational university free of all religious
influence. At the time Waterloo College had a policy of hiring only
Protestants. Jews, Catholics and anyone else need not apply.
The explosion was inevitable. In 1957 Waterloo College and the Associate
Faculties parted ways and charters were eventually obtained for two new
universities. Waterloo Lutheran University (WLU) and the University
of Waterloo came into existence. In the early 1970s, Waterloo Lutheran
University became Wilfrid Laurier University, both WLU so they didn't
have to change the monogram. St Jerome's federated with the University
of Waterloo but retained its own degree granting authority as St. Jerome's
University College. Under the guidance of the A.R. Kaufman, probably
the wealthiest man in the community, UWaterloo acquired farm land
on the west side of the City of Waterloo.
Within five years, in 1962, the core members of what would become the
UWaterloo Geography Department resigned their posts at Waterloo
College, again over academic freedom issues, and moved down the road.
In his 1990 reflection on the beginnings of Geography at UWaterloo,
Department Chair, Ralph Krueger, recalled the day he resigned from
Waterloo College. The following Saturday he received a call from the
University of Waterloo Dean of Arts asking him if he could come to a
meeting immediately. He was also asked to think about a departmental
budget on his way over. When the meeting ended he was offered the
job of Head of Geography. Things happened fast in those days,
Krueger recalled.
There is a hint, however, that teaching geography had already started.
“I heard a story,” says Professor Ron Bullock who came later to the
department, “that the first geography lectures were given here by
an Anglican priest, but I cannot say at what date. The lecturer was
Reverend Allan Barker. He was first Rector of All Saints Anglican
Church, of which I am a member.”
In 1966, the Geography Department began offering courses in planning
and by 1968 expanded to include what became the School of Urban and
Regional Planning. In 1967 architecture studies had started as a kind of
sibling of systems design in the Engineering Faculty. By 1969 the often
peripatetic School of Architecture seemed ready to attach itself to a
new environmental entity. The initial building blocks of the Faculty
of Environmental Studies had moved into place.

**Intellectual Ferment**

While the period following the Second World War was largely shaped by
the needs of the Baby Boom in terms of housing, education, entertainment,
retail and just about everything else, the intellectual changes underway
were no less earth shaking. From the time of the Enlightenment beginning
in the 17th century, science had been on a steady march towards dominating


human consciousness. Newton’s mathematics and other pure scientific advances made possible James Watts’ steam engine, Henry Bessemer’s steel process, Marie Curie’s radiation, Alexander Fleming’s penicillin and Banting and Best’s insulin. This inexorable “progress” led people to believe that all problems, great and small, could be solved by science. Even when scientific discoveries themselves became problems, there was overwhelming faith that some pill or powder or chemical not yet invented would come to the rescue.

By the 1960s, however, the scales of the scientific magic dragon were beginning to fall off. It became harder for observant people to ignore the twisted beaks of cormorants in the Great Lakes. Then the birds disappeared altogether. Rivers were polluted, fish were dying, insects became rarer and then absent and people got sick. Many scientists and ordinary citizens saw these changes and began to write about what they were experiencing. It isn’t possible now to know what geographers and others at the University of Waterloo were reading but one book stands out in retrospect as being perhaps the most eloquent commentary on what was happening. The American science writer Rachel Carson published *Silent Spring* in 1962. It was a scathing condemnation of modern society’s failure to recognize the damage our technology and science were doing to the planet. The indiscriminant use of pesticides, and DDT in particular, was a prime example used to illustrate her point.

As a result of her exposition Carson was viciously attacked by many mainstream scientists. She also became a target of derision for the wealthy establishment whose members were the beneficiaries of the dominant economic system. That establishment was heavily invested in the cult of science. For the same reason Carson was embraced as a hero by the new and generally younger generation of scholars, scientists and lay people who could clearly see that something was terribly wrong in their world.

Environmentalism as a social movement had arrived and within universities it had the power to fundamentally change the approach to science and scholarship in general. As David Suzuki would say in his 1972 Hagey Lecture, the economy is a wholly-owned subsidiary of the environment. The idea that there was a distinct field of study called “the environment” suddenly made perfect sense and organizationally it called for a devoted academic entity. Relatively new universities such as York, Trent and Waterloo were able to respond to this need in ways not possible at U of T, Western, Queen’s, McGill and UBC where the traditional forms of organization were as hard as the stone under their ivy. York initiated the first graduate program in environmental studies in Canada less than a year before ours but Waterloo can always boast about being the first with the full suite of graduate, undergrad and co-op programs in the field.

**Revolution**

Along with the inevitable consequences of the country’s mid-twentieth century population explosion and the intellectual foment that permeated the times, the third factor underpinning the emergence of Environmental Studies was revolution. It is hard to emphasize enough the chaos that was the 1960s as we perceived it in our Western European and North American corner of the world.

Let me give you a couple of examples. This chapter began with a description of the February 20, 1969 meeting of the UWaterloo Senate. That same week, on my 21st birthday, I was 7,000 km away in Rome, Italy, caught up in a full scale riot. In those years, all over the western world, riots, demonstrations and sit-ins were the order of the day. The situation in Rome was this, an unpopular American President – imagine – arrived in Italy.
The US State Department reported that President Nixon had “received a warm welcome from the people of Rome.” United Press International (UPI) reported that:

President Nixon flew today to Rome from embattled Berlin and pledged to consult his allies before talking with Russia. Across the city thousands of rebel students protesting the Nixon visit fought a running battle with police. Students from Rome University hurled rocks, iron bars and bricks at police and smashed several cars parked near the university. At the height of the battle police brought in a water truck and sprayed students with a bright red dye, driving them back into University buildings they have occupied for weeks.

I was on those streets and I can tell you what were “alternate facts” and what actually happened. George Francis, who would become the second head of Man-Environment Studies, recalls that:

In France, student unrest was also directed to long established university curricula, especially in the old high status upper-class institutions. Many students deemed these to be completely irrelevant to the world they were in. I encountered modest examples of this the day (and weeks after) I arrived in FES.

It was not just Europe that was experiencing running battles in the streets. South of our border civil rights protests and anti-Vietnam War demonstrations culminated in the 1968 Chicago Democratic National Convention riots. In the same year Larry Martin, who would later serve as Director of the School of Planning, also recalled being caught in a riot in Syracuse, New York, “with me under siege for forty-eight hours in a Red Cross Blood distribution centre.” Larry also remembered that “I actually considered the possibility that I could die during the weekend turmoil.”

Much of the rest of the world was coming apart at the seams. People were not just worried about the possibility of a rogue bomb from some outcast country or terrorist cell but the likelihood of an all-out nuclear war. Unlike today, the majority of Canadians in the 1960s remembered real war.

Protests at Waterloo in the 1960s were small and relatively peaceful by global standards. On one occasion, the story goes, when students confronted the President he said he agreed with them and joined the march. This does not mean students and faculty were not concerned. On the contrary, they were determined to do something about the state of the world.
Waterloo, as always, was peaceful by comparison to the rest of the globe but the flavour of revolution was wafting in the air. The deteriorating state of world affairs was beyond our control but there was a feeling that salvaging the environment was not. A new holistic way of approaching the study and analysis of the world around us was possible.

We may not know exactly how much writers such as Rachel Carson influenced the thinking of people at the time about the environment and new applications of geographical research. However, we do know that when Peter Nash, the first Dean of Environmental Studies, arrived in Waterloo, *Silent Spring* was in one of the boxes of books he unpacked. We have a clearer notion of the impact of another book on planners. In 1960, Jane Jacob's *Death and Life of Great American Cities* burst onto the urban planning scene. Planning, civil society, municipal governance and democracy itself would never be quite the same.

In 2006, Pierre Filion and I, with grad student Zaralynne Te, conducted a survey of what books had most influenced Canadian planners (Filion, P., Shipley, R and Te, Z. Works Planners Read: Findings from a Canadian Survey. Canadian Journal of Urban Research, 16(1): Supplement 59-91, 2007). Hundreds of professional planners responded. *Silent Spring* was on the list as was *Zen and the Art of Motorcycle Maintenance* (R. Pirsig). Also represented were well known thinkers like Lewis Mumford, Leonie Sandercock and Kevin Lynch but Jane Jacobs was by far the most influential scoring more than double her next nearest rival. Her move from New York to Canada in the 1968 to avoid having her sons drafted for service in the Vietnam War, served to increase the impact of her ideas in this country.

Jacobs was roundly critical of past and current planning practices but she was not despairing. She proposed solutions to both urban planning and broader environmental issues. She urged people to look at what has worked in the past and has stood the test of time, to analyze what you see in front of you and not base actions on theories alone. She said planners should consult the people who will be directly affected by decisions. This positive approach could be applied to environmental studies in response to the call for change that resonated at Waterloo. Amid a world in chaos this can be seen as part of the motivation for a new Faculty at Waterloo.

There is a building at the University of Victoria in BC named for Professor Howard Petch. He was the President there from 1975 until 1990. As far as I know, nothing is named for him at Waterloo. Professor Petch doesn’t even show up in the list of proper Presidents of UWaterloo because for less than two years, 1968, 1969, he was called President pro-tem. My Latin is woeful but I think that would translate “President for the time being” but he merits more than a nod from the Faculty of Environment. He was instrumental in its creation.

In late 1968, when he was Waterloo’s President pro-tem, Petch was approached by the fledgling Geography Department and School of Architecture about establishing a Faculty-level unit at the University. In response, he struck a committee, “to explore the possibility of a new grouping of disciplines and programs around the theme of environmental studies.” (Preston R. & Mitchell B. Reflections and Visions: 25 Years of Geography at Waterloo, Department of Geography Publication Series, number 33, 1990). The members of the committee were Tore Bjornstad,
Head of Architecture, which at the time was not attached to any Faculty, Jack Ellis from Systems Design Engineering, and Len Gertler, Head of the Planning program then part of Geography. The Head of the Geography Department, Ralph Krueger, was soon added to the committee.

"A man outstanding in his field." It is in fact Professor Len Gertler, who is widely credited with being the principal author of the Faculty of Environment founding document.

The Ad Hoc Committee on Environmental Studies, November 1968

The result of the committee’s deliberations was an extraordinary document entitled simply “College of Environmental Studies.” Reading through the necessarily dull and emotionless minutes of a university Senate one is suddenly struck by the dynamic language of this report, the passionate assertions and ringing challenges that jump off the page even after half a century. Those who knew the individuals involved generally agree that the stirring prose came primarily from the pen of Len Gertler. I suggest the report should be required reading for all constituents of the Faculty of Environment and should serve as the standard against which we can measure the success or failure of our collective efforts over the last 50 years.

I’m going to let part of the report speak for itself by quoting passages, but I have taken the liberty of summarizing what I consider to be the main aspirations that the authors set out. There is a spoiler alert regarding language; the following are quotes but the text was written 51 years ago and I have taken a second liberty of translating it into a gender neutral idiom. It begins:

A new area of moral concern and public responsibility is now taking form across this continent. This is the quality of the human environment. Although many of the components of this area of responsibility are not new, management of the environment as an integrated function is new. Specific elements of the human environment have long been modified and controlled by collective human action, but the concept of our total environment, as perceived through soundly-based understanding of human interaction with our environment, is a phenomenon of modern time.
Terms like “moral concern” and “public responsibility” had, in the opinion of the committee, not been heard enough in the halls of academia. The report continued:

The question must now be put as to what the universities of this nation, and this university in particular, are prepared to do to meet the challenge in this area of the environment. It may seem strange that impetus towards increased understanding and more effective problem solutions to environmental issues was not first raised in the universities.

The committee didn’t mince their words when it came to their opinion of why the human-environment relationship was under-studied. While acknowledging that individual environmental aspects were being explored they confronted the knowledge gap.

The most obvious factor to explain this reluctance may be that the configuration of knowledge as manifested in the structure of the university has not encouraged a focus on the environment as a system – to be first to synthesize an enzyme may merit the highest awards of science. But to synthesize a systems concept of human-environment relationships may bring neither reward nor respectability in the present academic framework.

The analysis of the situation offered by the committee was incisive but their prognosis was optimistic and in keeping with the growing culture and identity of the 12 year-old University:

It is the contention of this brief that the University of Waterloo has, at this point in time and with its presently-available resources, a unique opportunity to structure the academic framework for the emerging evolution of integrated environmental studies.

The Seven Aspirations

After describing the gap in scholarship and identifying the opportunity for Waterloo to take leadership, the committee laid out the goals and direction the new College or Faculty should take. These guides can be stated in the following seven declarations:

1. The new College/Faculty should be the locus for a body of knowledge and understanding of the human environment.

2. In this setting, professionals will be trained in an educational atmosphere where they can develop a degree of mutual understanding, which will foster a team approach to problems in their professional life.

3. The environmental professions should develop in vigorous contact with the mainstream of academic thought and life environment.
It is a kind of manifesto, a call to arms and a road map toward a vision. At the February 20, 1969 Senate meeting, having introduced the motion to create Environmental Studies, President for-the-time-being Howard Petch, relinquished the chairmanship of the meeting to an associate and made the pitch to the Senate himself. He explained that the Report of the Ad Hoc Committee on Environmental Studies (quoted above) had received wide circulation since its release three months before. He produced a page and half long list of individuals from many departments in the University who had been personally contacted for their opinions. He pointed to letters of support from both undergraduate and graduate student organizations and the faculty members in Architecture, Geography and Planning.

Dr. H.E. Petch, a Professor of Physics and stand-in President, clearly put himself and his reputation on the line in order to see that a College or Faculty of Environmental Studies would become a reality at Waterloo. He has been, until now I think, the forgotten person in our history. In the end his motion was to create what they decided to call the Division of Environmental Studies, neither the fish called College nor the fowl called Faculty. However, it was to have the “status of a Faculty” and within a few years the name was changed to reflect that reality.

The motion passed. As of July 1, 1969, Environmental Studies was in business at Waterloo. Looking back over 50 years we can fairly ask, has the Faculty of Environment met its seven aspirations?

Looking ahead to the next 50 years we can ask what beacons will guide our course?

4. Within the College/Faculty there should be a totally new undergraduate program of human-environment studies which will produce an important educational product of its own – a student of humans and their environment per se.

5. Graduates of the College/Faculty should take their role in the ranks of decision-makers in industry and government and direct other professionals in the shaping of the environment.

6. A College-wide Council for Graduate Studies should be created and would permit an interdisciplinary enrichment of graduate programs.

7. Such a Council would be a focus for graduate students who may be registered in other Faculties, but whose research concerns some aspect of human environment relationships.
Chapter 2
Growth and Development
Once Environmental Studies was officially constituted as an academic entity within the University of Waterloo, it quickly became evident that making it work was going to be a challenge. There would be headwinds, rough terrain, choppy water, call it what you like it was not going to be easy.

Peter Nash had been attracted from the United States to be the first Dean. A decorated World War II veteran he was no light-weight when it came to leadership and his academic and professional qualifications were first rate. He had graduated from UCLA and Harvard and had worked as an urban planner, municipal official and teacher in such places as Boston, Worchester, Chapel Hill, Cincinnati and Rhode Island. He was a member of the Association of American Geographers, the American Planning Association and in Canada he was eventually honoured as one of the top ten geographers in the previous 100 years. One of Dean Nash’s most significant connections was with the World Society of Ekistics. Ekistics was defined by its guru, Konstantinos Doxiadis as, “the science of human settlements, including regional, city, community planning and dwelling design” and which “involves every kind of human settlement, with particular attention to geography, ecology, human psychology, anthropology, culture, politics, and occasionally aesthetics.”

There is a story that Peter Nash, along with Buckminster Fuller and Margaret Mead, attended a conference on ekistics one summer on a ship in the Greek islands with Doxiadis.

Nash saw it as his mandate to establish that kind of integrated approach to the human environment. In spite of the initial enthusiasm, however, the devil was in the details. Geoff McBoyle, who occupied the Dean’s chair some years later, said that Nash was constantly “running up against” the unit heads as each tried to create their own identity.
A seemingly trivial but a telling example occurred when Professor Nash set out to design a common recruiting brochure for the Faculty. Some units didn’t want to participate. He had to threaten to put in a space for them but leave it blank when the brochure was printed. He tried to get agreement to have a common first-year program. Geography and Architecture couldn’t agree. He tried to encourage other departments such as Biology and Sociology to offer courses for Environment students. For the most part they weren’t interested. Instead he had to begin hiring people with various disciplinary backgrounds and to develop the range of courses needed in-house. Sally Lerner recalls enjoying some success engaging in projects with other ENV people and even beyond the Faculty but for the most part in the early days, it was hard breaking through the “impregnable silos.”

In spite of the growing pains, there was a positive energy from early on. Joanne Holzinger started as Professor Nash’s Secretary and she remembers that:

… it was a much smaller group with fewer departments back then since it was a new Faculty. I remember it being a very friendly group with everyone getting along. We were all in one building, Environment 1 (EV1) and our offices were in the basement for many years. In the early years it was a fun Faculty to work in – there was never a dull moment.

At this point it may be better to revert to telling the stories of how the four original units, Geography, Planning, Man-Environment and Architecture evolved and how they grew together or apart as the case may be. Later we will return to describe the newer units, the School of Environment, Enterprise and Development; Knowledge Integration, and their various programs.
Geography

Let’s turn the clock back then, to the 1960s. I’ve heard that if someone
says they remember the 60s – they weren’t there. The fact is that amid
the smoke and protest that was obscuring much of the western world
this University was taking shape in remarkable and creative ways. By the
mid 1960s there was a Geography Department within the University of
Waterloo Faculty of Arts.

In 1961 John Horton, who would later play a key role in the School of
Planning, was the first geographer hired. In 1962 Ralph Krueger became
the Chair of Geography when he and three other professors defected from
Waterloo Lutheran. Professor Krueger had studied at the University of
Western Ontario (BA, MA) and the University of Indiana (PhD). A group
of students also transferred to UWaterloo so that from the beginning
Geography had students in all four years. Together, Horton and Krueger
shaped a course of study for the new department which was broad in scope
and required students to take courses in physical, human and regional
geography as well as methods.

But from the beginning Geography was pulled in three directions.
The notion of a College or Faculty devoted to the study of environmental
challenges was strong and it was clear that if such an entity came into
existence Geography should be at its core. At the same time Geography
was an important part of the Arts Faculty where the education of future
secondary school geography teachers was a prime concern. Many in Arts
didn’t want Geography to leave. The third pull concerned Planning.
By the late 1960s the name, Department of Geography and Planning,
reflected the fact that Planning was one of the main programs within the
department. There was a strong argument that Planning education would
be better served if it took place within a separate School where the term
School indicated a pathway to professional status. These dilemmas were
each solved in different ways.

In spite of the existential tugs and pulls, throughout the 1960s the
Department grew rapidly. It grew, as Sandy McLellan, one of those hired says,
“with new faculty appointments respecting the acknowledgement of the then
current ‘environmental revolution’.” While the Department grew in numbers of
faculty it also expanded in breadth and depth. Lorne Russwurm had a very
practical background in agriculture (he had been a farmer) and he developed
and taught some of the basic courses in the department. In research he
emerged as the leading authority in the country on matters related to the
urban-rural fringe and the special patterns of growth. Bruce Mitchell,
now a Fellow of the Royal Society of Canada, came as an expert in water
management and watershed planning. Dieter Steiner arrived in 1968 and was
later succeeded by Doug Dudycha as one of the leaders in the development
Her teaching and research concerned issues of urban sprawl, the health of
downtowns and the environmental behaviour especially of pedestrians and
children. She was a pioneer in the analysis of safety in urban spaces.

Other new faculty members brought skills and knowledge representing
an ever-widening spectrum of study. A regional focus, however, was
to be retained. Gordon Nelson came with his involvement in parks
and natural heritage, Ellsworth LeDrew, later made a Fellow of the
Canadian Aeronautics and Space Institute, brought his interest in remote
sensing and Bala Hyma with her studies in international development.
Throughout the 1960s, the list of talented scholars grew to include Jim
Bater, Ron Bullock, Aubrey Diem, Dave Erb, Bob Irving, Geoff McBoyle,
Roy Officer, Richard Preston, and David Walker; and others who launched careers at Waterloo and then went on to other institutions.

None of these appointments were random. Under Krueger’s leadership there was a clear strategy. The program would fit into the various niches not already represented in other Canadian universities. At the same time, the Department would have a strong undergraduate program taught by the best possible lecturers, such as Professor Jean Andrey, who has won four prestigious teaching awards. Professor Andrey accomplished something almost unheard of by making statistics popular with students.

The emphasis on the undergraduate program persisted for some years and the numbers of Masters and PhD students remained constant even as the contingent of Bachelors students increased. In order to attract the best students a solid partnership was forged with secondary school teachers and their association.

The 1970s and 80s were exciting times for the maturing Geography Department. Geoff Wall, who joined the Department in 1974 remembers that:

We were all young and were given administrative positions so we needed to meet with other sections of the University. We were empowered and sometimes we felt able to represent the University. There seemed to be great freedom and latitude to do things.

Geography also had its personalities. Professor Ian McKenzie recalls that his colleague Geoff McBoyle would show up to teach the large introductory class and kick off his rubber boots at the door and take to the lecture podium in his workman’s socks. Professor McBoyle’s lectures were legendary for being both informative and entertaining.

Your writer finds it a bit hard to imagine these young, swashbucklers since I met them when they were senior academics, knowledgeable, venerable, confident and perhaps even wise. Dr. McBoyle when he was Dean always wore a dark suit and brogues, never gum-boots. But I think the Geography faculty members are no less dynamic now than they were back in the first quarter century of the Department. Dynamism was certainly needed in the fast moving times when the Environment Faculty was being formed and in the midst of those times Geography had to sort out its three dilemmas: its potential role in a new Faculty, its relationship to the Faculty of Arts and what to do about Planning.

During the latter years of 1960s decade, the Dean of Arts, Norman High, had allowed Geography a great deal of latitude to grow and evolve. When a new Arts Dean took over that freedom began to erode. The more talk there was about forming an Environment division, the more the geographers saw it as the better option for their ambitions. In the fall of 1968 almost as an after thought, Ralph Krueger, Head of Geography, was added to the committee discussing the new College of the Environment. The committee’s report included Geography as a founding member.
Professor Ian McKenzie (left), Commander Chris Hadfield (centre) and Former Governor General David Johnston (right) inaugurate the Geography and Aviation Program. At the time Professor Johnston was President of the University of Waterloo.
Leaving the Arts Faculty was not a simple separation but more like a divorce with some custody issues. There was considerable discussion but in the end it was decided that a general arts degree in Geography would remain as part of the Arts Faculty while the rest of the department’s assets would become part of the new Division of Environmental Studies. Regular Geography faculty taught all the courses in the general Geography program but one of the anomalies of the set up was that geographers were required to sit on some Arts Faculty committees and to perform other academic duties. The arrangement persisted for years.

A couple of new initiatives undertaken by the Department of Geography, in more recent years, are the degree in Geomatics and the Geography and Aviation program. In the former students can specialize in the more technical aspects of spatial analysis. Professor Richard Kelly says:

GEM has the strongest geomatics program in the country for a department that is not an engineering department where geomatics is typically taught. We focus more on the geographic information science, how GIS and remote sensing can help to answer pressing real world questions about the environment.

In the Geography and Aviation program students earn their pilots licenses concurrent with their academic degree requirements. Professor Ian McKenzie has been the driving force in these areas while Former Astronaut, Commander Chris Hadfield, has taken a central role in the Aviation program.

Although the Faculty’s first advertised position related to the Human Dimensions of Climate change resulted in the 1989 hiring of Jean Andrey whose work is at the interface of climate and transportation, over the ensuring two decades, the Faculty has emerged as a Canadian leader on climate change. In fact, the first Master’s in Climate change (MCC) for North America was developed here, with its first intake in 2013. Program offerings have expanded again, with the approval of a Graduate Diploma in Climate Risk Management in 2018.

Planning

Geography’s relationship to Planning, by way of contrast, was more straightforward and parental although saying that Planning was hatched rather than born, might be a better metaphor. Planning is in many ways applied geography. Starting in 1966 there were some embryonic planning courses offered in the Waterloo Geography Department. By 1968, a Planning Program within Geography was established. However, it was felt that the needs of the Planning Program might be best met through a separately administered academic unit within the fledgling Faculty of Environmental Studies and so on July 1, 1969, the same day as the ENV Faculty emerged, the School of Urban and Regional Planning, SURP for short, took flight.

However, that didn’t happen in isolation. It is common in planning texts to give a quick acknowledgement to the ancient Romans for building straight roads and the Babylonians for having sewers but such books usually say that actual planning only started about 1900. That, of course, is nonsense. There has always been planning. When Haudenosaunee or Wendat people constructed longhouses in their villages over thousands of years, somebody decided where things would go. They may have been more collective decisions but I doubt if they were random.
What was different by 1900 was the recognition of a cluster of activities that were becoming a specific profession. In Canada, an association of professional planners similar to those in the UK and the US had existed since the 1920s. By the 1960s the Canadian Institute of Planners (CIP) was empowered to accredit university planning programs if they met a strict set of requirements. Accreditation meant that graduates enjoyed a fast track to professional standing. This fact provided an additional reason for creating a stand-alone Planning School and not long after its founding, the School’s undergraduate and graduate programs were recognized by the CIP.

Educating prospective planners who could work effectively in an increasingly complex world presented specific challenges. Unlike other professions, planning has a meager cannon of classic literature. Disciplines such as history are studied against the vast backdrop of previous writing. Planning is slowly building a body of subject specific literature but compared to other disciplines it is relatively recent.

Similarly planning has no profession specific core methods. The natural sciences have variants of the experimental method and social sciences rely heavily on statistical analysis. Students of all these disciplines can be educated in the use of those methods. In order to acquire data and information to inform planning policy, as well as specific land use decisions, planners have to borrow knowledge and methods from other areas, demographics, engineering and market research, to name a few. All of these vital yet often conflicting factors were in play when the idea of a distinct and separate planning school emerged from the dynamic and innovative cauldron of 1960s Waterloo. As well as borrowing knowledge and methods from other disciplines, Planning borrowed almost all of its founding people from the Geography Department, including the late Professor John Horton.

The first Director of the School was Len Gertler. Having been educated at Queen’s, McGill and U of T, Gertler came to Waterloo in 1966 from the trenches of practicality. He had served as Deputy Planning Director in Toronto, Planning Commissioner in Edmonton, and had worked in the private sector with the engineering firm Acres. As we shall see, he had also done important work abroad. He is perhaps best known for his foundational contribution to the Niagara Escarpment Plan. He was involved in the Escarpment Study in 1968, the drafting of the Act in 1973, the Plan of 1985 and World Biosphere nomination in 1990. In 2011, On Nature magazine said Gertler was, “Canada’s guru of environment-first planning for broad geographic regions. He wanted our cities to be cities and the countryside – the farmlands, woodlands and wetlands – to stay countryside.”

The second founder was Bob Dorney. Dorney was from Milwaukee and had received his PhD from the University of Wisconsin in Veterinary Science and Wildlife Management. As an ecologist, he pioneered the study of environmental management. In addition to his experience in the United States, he had also lived and worked in Latin America. In 1967, he became a professor at Waterloo in the area of applied ecology, environmental and resource management.

The name chosen for the new department, after what I’m sure were long and spirited discussions, was very much in keeping with Gertler and Dorney’s philosophy and ideals. They called it the School of Urban and Regional Planning (SURP). The moniker was apt for a generation that defined and established the concept of sustainability. It wasn’t until 1998 and after equally prolonged and genuine debate, that the name was simplified to School of Planning. I was present for that discussion and can attest that there was no less commitment to broad regional planning...
ideals. However, the world had changed and planning in the popular understanding now included regional concepts.

An equally important decision that was made early in the life of the School concerned the level at which planning should be taught. In the UK there were already planning programs at the bachelor’s level. In the United States, by comparison, planning was introduced at the Master’s level in the tradition of professions such as law. PhD programs were fewer and further between and are preparation mainly for research and teaching careers. By the 1960s in Canada, there were undergraduate programs at Manitoba and Ryerson in the British mode and graduate programs in the US style at Queen’s and UBC. In true Canadian fashion, Waterloo decided to go both ways at once and offer all three levels of study. In doing so Waterloo followed Laval but remains the only comprehensive English language program in Canada.

The degrees offered also reflected the emphasis on the environment. In 1968, both levels of graduate programs were launched with the degrees being called an MA or PhD in Regional Planning and Resource Development. During the first few years, graduates could choose a BA but after 1973, the undergraduate degree was a Bachelor of Environmental Studies (BES). In 1996, the School received approval to re-title the graduate degrees to simply Planning. That more accurately reflected the broad context of studies possible in the School. Since 1998, students have also been able to obtain a Master of Environmental Studies (MES) in Planning. Since 2003, the course-based Master of Applied Environmental Studies (MAES) Degree has been offered.

Once the School’s originators had laid the foundations, they began to add to the structure. New hires expanded the School’s capacity to teach young planners. George Rich had been educated in the UK at the Oxford
Polytechnic (now Oxford Brookes University) and came to Waterloo from being the Planning Director in Winnipeg. One of Rich's lasting contributions was establishing the Oxford Field Course.

Helen Abel, a sociologist, introduced rural planning to the mix. George Mulamoottil came to teach hydrology and infrastructure planning. Karen Hammond, brought her skills as a landscape architect to teach urban design. To lead the School into the dawning age of computers, Ross Newkirk came to Waterloo from Western. From McMaster, Brent Hall came to bolster studies in Geographical Information Systems (GIS).

Not all of the hires were conventional. Saul Herzog was an architect practicing in St. Catharines in the late 1960s. Len Gertler wanted a new house built when he came to Waterloo. Saul came to design the home and started helping George Rich teaching design and soon Gertler found the money to hire Saul full-time.

Many of these contributors were colourful characters. One early faculty member, Kiyo Izumi is said to have taken mind-altering drugs, under medical care of course, as part of designing a mental hospital. Norman Pressman was an architect from Montreal whose specialty was designing for winter cities. Many of us remember the day a crashing sound came from his office and we rushed to find his book shelves had collapsed and buried him on the floor. Mike Stone studied rivers and storm water management but moonlighted as the drummer in a local band that played at the Heuther Hotel. One of the leaders who solidified the academic reputation of the School with her research on gender issues in planning was Dr. Beth Moore-Milroy. She was also known as a fierce marker. One day she asked me if it was true that the students called her Dr. Death instead of Dr. Beth. I admitted that I had heard that but assured her that the students meant it in the best possible way. Parks planning was a long standing theme in SURP and one of the champions was John Theberge,
aka Wolf Man because of his interest in Algonquin Park wolves. John kept road killed wolf carcasses and bags of wolf scat in a freezer in the ecology lab for analysis. That is until there was a power failure one day and everything melted.

**Man-Environment Studies**

In the 1968 Report of the Ad Hoc Committee on Environmental Studies, the founding document of the Faculty, the authors had specifically recommended that, “there should be a totally new undergraduate program of human-environment studies which will produce an important educational product of its own – a student of humans and their environment per se.” In forming a Geography Department, a School of Planning and a School of Architecture, no matter how innovative and original you wanted to be, there were existing models. Man-Environment was something completely new. Initially led by Professor Jack Ellis from Electrical Engineering, the new unit’s first full-fledged director was George Francis, now Distinguished Professor Emeritus. Dr. Francis said the Faculty, “was faced with questions, how does one teach about environment?”

There were only six very dedicated students enrolled in the program in the first year except there was no program. George relates that:

> When I first met with the students to discuss curriculum, I remember one very vocal female student who said they did not want to be sitting in rows of desks and being “lectured at” and instead wanted to sit on the floor. I then also sat on the floor with them and got them talking.

This simple gesture was nevertheless symbolic of what the department would be like. Sally Lerner who joined in 1970, said that they, “were given complete freedom to develop the department in terms of teaching.”

Man-Environment eventually changed its name – first to Environment and Resource Studies, (ERS) to respect the movement towards gender neutral language, and then to the School of Environment, Resources and Sustainability, to recognize the interdependence of biophysical and social factors for long term wellbeing. The evolution of the name also reflected wider discussion about how we talk about and conceptualise things. For example, was the experiment in the study and education going on in ERS disciplinary, inter-disciplinary, multi-disciplinary, cross-disciplinary, trans-disciplinary or was it something different again. The debate was both external and internal.

George Francis recalls that some people in the sciences such as biology and ecology felt that their colleagues in ERS did not have the requisite education to be undertaking environmental research and teaching. The social scientists from other departments had similar misgivings about those ERS people engaged in surveys and other social science methods. Professor Francis had a huge job explaining the enterprise to sceptics across the campus.

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**Professor George Francis** of the Department of Environment and Resource Studies.
While this existential discussion continued within the Environment and Resource Studies Department, the unit continued to build a faculty complement that was diverse in its disciplinary background while focused on the unique experiment underway at Waterloo. Francis reminded the university community that it was, “not just about the sciences but also about human-environment interactions.” Soon ERS had faculty members with academic qualifications in Arts and Design, Biology, Economics, Geology, Geography, Political Science and Psychology. Some of these people, such as George Priddle, were enticed over from Geography. Others, such as Jim Robinson, James Kay and Bob Gibson, were recruited from outside. Geoff McBoyle, who served as the fifth Dean of Environment, once called the ERS faculty a “motley collection of people,” but I think he meant it as a compliment. Similarly, Steve Murphy, the current Director of what is now the School of Environment, Resources and Sustainability (SERS), recalled that people thought of the department as the “flower children” of the Faculty. Through the evolution of ideas, cross pollination of methods and genuine new thought, the term Sally Lerner thinks ERS was best described as “holistic.” Eventually, faculty like Dan McCarthy were home-grown having themselves graduated from the program. And still more remarkable scholars were attracted. Jennifer Clapp is a Canada Research Chair in Global Food Security and Sustainability (Tier I), holder of a Trudeau Fellowship, and fellow of the Royal Society of Canada. She is probably our most decorated faculty member.

The name change from ERS to SERS occurred in 2016 following several years of sometimes rancorous debate over the word sustainability. For a time in the 1990s, Steve Murphy says, “sustainability was a ‘dirty word’ because people thought it was too overused, too much of a ‘motherhood’ term. It was out of fashion.” Then sustainability started gaining more popularity again, especially because of the popularity globally of the United Nations Sustainable Development Goals.

The openness led to many instances of co-operation and collaboration. James Kay was serving on a board that was developing an environmental education park. Along with some private sector colleagues, I bid on the job of creating a long term vision and plan for the park. We won the tender and completed the work. In the meantime, James, knowing that I was also studying planning processes, saved copies of all the competing bids to give to me for analysis and comparison purposes. This would probably violate privacy regulations today, but it was the kind of thing we got away with in those days.

**School of Architecture**

The relationship between the School of Architecture and the rest of the Faculty of Environment was fraught. When I considered how to tell this part of the story, I remembered something that had been told to me not by one but by two different informants. In the early 1970s, people in the Faculty were convinced that a certain Architecture prof was a CIA agent, the CIA being the United States Central Intelligence Agency. He was a spy, they said, keeping an eye on Canadian revolutionaries not to mention American war resisting refugees. I have absolutely no idea if the story was true but I rather doubt it. The point is that it was an example of the underlying tension that existed during many of the 35 years that Architecture was a sibling in the Environment family.
That was particularly unfortunate because the original intention of joining the four units was good and the theory behind the amalgamation was sound. The School of Architecture began life in 1967 as a branch of Systems Design Engineering where the emphasis was on structure and materials but that was not where the Architects wanted to be. In the late 1960s, there was a report on teaching architecture in the US, which, for the first time, stressed the importance of the environment. At the same time there was a feeling that architectural education should be more conditioned by exposure to non-technical subject matter. One of the reports to the University Senate in 1969 expressed this idea:

It is clear that the educational program for an architect must draw heavily on the humanities, the social sciences, the natural sciences and the applied sciences. It is also clear that in practice, an architect must be able to work as a team member with other specialists such as planners, civil engineers, designers, landscape architects, transportation engineers, etc. One way of achieving these objectives would be to educate architects, in at least the non-professional parts of their program, with students studying in closely related disciplines. This suggests that the organizational identity incorporating architecture should be part of a larger structure, which would also contain cognate programs.

That sounds very supportive of the Environmental Studies concept and indeed when the ES Division (later Faculty) was formed, Architecture was a charter member. At the same time there was a faction within Architecture whose vision was of an autonomous entity similar to the Architectural Association School in London, England. They must have had some power of persuasion because the UWaterloo Senate, in an act of great flexibility also passed the following motion:

That the University, at this time, make the commitment to establish, by September 1968, an independent organizational identity for architectural studies separate from Engineering.

That doesn’t sound like the integrated model proposed by Professors Krueger and Gertler and managed at the time by Professor Nash. From the get-go then, there were, what I would call, centrifugal and centripetal forces at play. Some policies and practices were pulling Architecture into closer relations with the other units. Sally Lerner remembers working successfully with faculty members in Architecture and says that going into the architecture studios was, “like going from Kansas to Oz, they were always doing amazing and interesting things.” I also worked well with several people in Architecture and enjoyed having the Director, Rick Haldenby, on my MA thesis committee in the early 1990s. But there were other dynamics causing Architecture to pull away.

One of the problems with nurturing co-operation was location. For 13 of the 35 years that Architecture was part of Environmental Studies they were located in different buildings on Phillip Street before their move to campus and to Cambridge. Another corrosive factor in the Architecture-FES relationship was student attitude. Rick Haldenby admits that all too often Architecture students tended to look down on their peers in other units but especially those in Planning. I wonder how that has played out in terms of the team work required for city building referred to in the Senate Report quoted above. In the end, however, it was more administrative and practical matters that caused the most serious cleavages.

The way the Architecture program was organized, for the first 30 years, students went on co-op starting in first year. They were awarded a Bachelor
Educated as a landscape architect, Karen Hammond is the longest serving instructor in the School of Planning. Here, with characteristic enthusiasm, she is guiding students in an urban design challenge.
“LIKE GOING FROM KANSAS TO OZ” WAS HOW PROFESSOR SALLY LERNER DESCRIBED VISITING THE SCHOOL OF ARCHITECTURE.

of Environmental Studies (BES) after three years and then a Bachelor of Architecture (BArch) after an additional two years. There were three problems with the 3+2 co-op model: 1) it was felt that Architecture students could not participate in common, first year, introductory environmental courses because they needed the time for skills courses that made them immediately useful in architect’s offices; 2) other schools gave a Masters degree after five years and 3) many Waterloo students left after their three years to either work or seek Masters degrees elsewhere in Canada or in the US or Europe.

The first problem, as we shall see, was never solved. The second problem was eventually solved by the adoption of the 4+2 model where students received a BArch after four years and a Master of Architecture (MArch) after an additional two years and a formal thesis. Let me digress for a moment to mention that the latter change, while good for the Architecture program, had two immediate consequences for the Faculty. The moment the change took effect more than a hundred former undergrads in architecture suddenly became grad students, upsetting the overall dynamics, funding and administration of the graduate program. Many Environment Faculty members felt that few of the Architecture professors had the experience to supervise grads. Finally, there was concern about what an Architecture thesis would look like, would it be a design or would there be a written research component?

All of that lay in the future but there would have been little future back in the late 1970s unless a solution was found to stop the bleeding away of students after they got their three year BES. The world out there was just too rich to spend two more years getting another Baccalaureate. The solution was the School of Rome, which was conceived by Rick Haldenby.
The work of Waterloo Architecture graduate **Alison Brooks** (1988), Exeter College, Cohen Quad, Oxford graces one of the world’s great skylines, Matthew Arnold’s “dreaming spires.”

*Used with permission – Allison Brookes Architects, London UK*
and began in 1979. He had forged connections in Rome that enabled Waterloo Architecture students to begin their fourth year with a term in Rome. That meant studying the classics of their trade up close. The drain of senior students to practice and to other schools stopped with almost all now returning to complete their studies at Waterloo.

Over the years since its founding in 1967, the Waterloo School of Architecture has risen to be arguably the leading Architecture School in Canada. It was the first School in the world to adopt an environmental focus. There are courses in literature, film, social science and history but they are all taught in-house. The graduate theses now deal with concrete, technical research topics of vital interest to the building community. In the annual publication of drawings submitted by students from the ten Canadian schools of architecture, the contributions from Waterloo always out-class the rest.

What was probably the most momentous chapter in the School’s history to date was the move to Cambridge. While Waterloo had two universities and Kitchener, Brantford and Stratford eventually got some pieces of those institutions, Cambridge for many years was left out. In the early 2000s, an energetic group of civic, academic, and corporate leaders in Cambridge envisioned a new building for Architecture. Money was raised, a building was purchased, deals were made, grants applied for and in 2003 the old silk factory in Galt became Architecture’s new and dazzling home.

About the same time, the School of Architecture came to its final catharsis with the Faculty of Environment. They opted to rejoin Engineering. My own feeling is that Architecture had always been a large fish in a small pond when they made up one quarter of the Environment Faculty.

That meant they had to participate in administration and formalities that chafed. Becoming a small fish in the big pond of Engineering, physically removed and administratively minute, allowed them to achieve their long time goal of virtual, if not actual autonomy. Unfortunately the change was made without consulting the Environment Faculty and it would be pollyannaish of me not to acknowledge that feelings were hurt.

Many long-time members of ES felt that a myriad of accommodations and compromises were made in order to include the School of Architecture and the architects themselves in the academic milieu. For example what constituted creative work and academic contributions for annual performance review purposes was expanded to include design and other work accomplished by architecture professors.

Still and all, the School of Architecture is a nationally recognized leader in its field and for 35 years we were family. As Barbara Yeaman, long-time Senior Administrator in the Dean’s Office points out, “there is no doubt that they have brought credit to the University of Waterloo. Award winning practitioners such as Brigitte Shim and Howard Sutcliffe, and Alison Brooks were all graduates of Waterloo.” We can celebrate our many good times. We can applaud their successes, enjoy their fame and we can ponder the aptness of Sally Lerner’s nicknaming the School Oz.
Maturity and Cohesion

I have walked us separately through the establishment and growth of the four founding units of Environmental Studies. In doing so I’ve intimated that to some extent they were on different paths but I think that for the most part those paths converged.

Through the efforts of Professor Nash and his successors as Dean, Gordon Nelson and James Bater, several basic, common, undergrad courses evolved. These included introduction to environmental studies, professional communication, field ecology, data management and statistics. One of the most important areas for common courses was environmental law, which was taught over the years by various adjunct professors such as Scott Snyder, who were themselves lawyers. In the last ten years, environmental sustainability and ethics was added with the encouragement of St. Paul’s College. Today different combinations of these common courses are mandatory for different programs and are taught by members of different ENV units.

Nevertheless, over the years a genuinely integrated and interdisciplinary ethos did evolve in the Faculty of Environment. Mary Louise McAllister says:

I appreciate the trajectory that Faculty of Environment has taken since I started with its growing focus on experiential education and focus on questions of sustainability. When I started, the Faculty seemed less integrated. Now there seems to be more inter-departmental linkages.

As Gordon Nelson comments, “as a work space, ES1 (now EV1) was certainly designed for disciplines rather than cross disciplinarity and mutual learning.” To overcome that disadvantage and other communication gaps, regular weekly meetings were held by the Dean, Associate Deans, Department Heads and School Directors. In this respect, it is important to recognize the commitment and role of strong Associate Deans in the Faculty, notably Sandy McLellan (Geography), Jim Bater (Geography), David Walker (Geography), George Mulamootil (Planning) and Don MacIntyre (Architecture). But it was dry hot work for which Peter Nash had laid the foundation.
As the calendar moved into the 1980s, the tapestry that was Environmental Studies began to take a more distinct shape not just in common courses but in many other aspects. The warp and weft of major and minor degrees and research and graduate advising brought people more and more into contact across departmental divides. For example, by completing certain combinations of courses, students could be awarded a major in ERS with a minor in Geography. There were also specialties that could be reflected on graduating transcripts. Many of these required course credits were from other departments. The walls between units became more permeable. Steve Murphy learned from his predecessors that areas which, in early years were seen as places where departments were competing for grants, were now seen as opportunities to co-operate. It was better when there were “more links in the chain.”

In the opinion of Geoff McBoyle, it was the advent of international initiatives beginning with Indonesia and subsequently in Pakistan and China that were very significant in the integrative growth of the Faculty. The initiative in Indonesia depended largely on the leadership of Jim Bater and Bruce Mitchell, and was done along with York University. What many do not realize is that Len Gertler had established a strong bridgehead in Indonesia where he had been largely responsible for drafting the planning legislation. “Working in Indonesia opened many people’s eyes,” McBoyle says and people wanted in on the action. There were three main outcomes for the Faculty: it provided money and experience for grad students, it gave international exposure and a place in the world to the Faculty and faculty members from different units started working together in earnest. Departmental walls that had first become permeable became porous. It was not uncommon for a grad student to be admitted to Planning but with an advisor from Geography or admitted to ERS with a committee member from Planning, who brought specific skills to the student’s research topic. Up until that point, however, the numbers of grad students in the Faculty as a whole had remained relatively small and static. The main issue was money. Grad students were guaranteed some financial support through Teaching Assistantships but seldom anything more. It was hard to compete for good students with the older, established...
universities that could offer more. Students, we told ourselves, came to Waterloo for quality education, not for the money. That couldn’t last.

Up to the early 1980s there was not much emphasis on publishing and grantsmanship. Pierre Filion of the School of Planning says that when he was hired in 1985 he was told that teaching was important and that research was a hobby, to be done after hours. Many faculty members had done a lot of research over the preceding years but the results ended up in government documents, position papers for NGOs and public presentations. For example, Ralph Krueger was very active in the Preservation of Agricultural Lands Society (PALS) who were fighting to save the Niagara fruit belt. The data he provided found its way into PALS’ papers that sometimes, but not always, bore his name. Len Gertler and Bob Dorney were instrumental in the establishment of the Niagara Escarpment Commission and Escarpment Plan. George Francis was a scientific advisor to the International Joint Commission of the Great Lakes. Greg Michalenko helped establish Areas of Scientific Interest in Waterloo Region and Gordon Nelson pioneered planning for national parks and cultural landscapes with Parks Canada and the International Union for the Conservation of Nature (IUCN). These are just a few of the Faculty’s wonderful contributions that will be discussed in more detail in the next chapter but what they were not was peer-reviewed publications. FES professors “paid the price” as one informant put it, for being unconventional academics. They were given lower scores in the annual performance reviews due to low publication rates.

That university “publish or perish” dictum was catching up with Environmental Studies. Without more peer reviewed articles it was difficult for FES members to apply for grants from the Social Science and Humanities Research Council (SSHRC) or Natural Science and Engineering Research Council (NSERC). The University increasingly leaned on Environment to win its share of government money. The research work that had been and continued to be done was good, even vital to the health of the environment, but the emphasis shifted. Stephen Murphy, Director of what is now the School of Environment, Resources and Sustainability (SERS), says the days of boutique teaching came to an end. Pierre Filion has reflected that while the change was inevitable and the Faculty has more than risen to the challenge, it is true that professors today have less time to chat with students.

The numbers tell the story. In 1974 to 1975 the Faculty’s total income from grants and contracts was $223,794. In 1978 to 1979 it was still only $354,475. Two years later in 1982 to 1983 the figure had begun to grow more rapidly and stood at $892,551. By 2017 to 2018, it was $9.4M. Virtually all new hires from the late 1980s onward were people who could produce journal articles, books and book chapters and who could consistently bring home Tri-Council grants. Tri-Council refers to SSHRC, NSERC as well as the Canadian Institutes of Health Research (CIHR).

As well there are now six funded Canada Research Chairs including three of the seven SSHRC chairs awarded to the University of Waterloo.

Computing

“When I arrived at Waterloo in 1976,” said former Associate Dean for Computing, Ross Newkirk, “computing in the Environment Faculty was in the Stone Age.” Western at the time was far ahead in applying computers to Geography.
### The Numbers Tell the Story

**The Faculty's Total Income from Grants and Contracts**

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When your writer arrived at Waterloo 14 years later in 1990, there were neat rows of chubby little Mac 2s in the computer lab. It was up to the Bronze Age but still had a long way to go. I was a mature grad student who had been out of university for 20 years and had to ask an undergrad how to open a spreadsheet.

Gordon Nelson had moved from the University of Western Ontario (now just Western University) to become Dean in 1975. He invited Newkirk, a colleague at Western, to provide a report on the future computing needs of the Faculty. Math and Engineering at Waterloo had powerful computers (powerful for the time) and they were taking the world by storm with their WatFor magic. Marko Dumancic, later the manager of computing remembers that, “while it was considered normal for those Faculties to have this kind of computing power, some questioned why the Faculty of Environment, the ‘tree huggers,’ would need this kind of technology.”

“I had to show them what kinds of applications we were branching into,” recalls Newkirk. Tore Bjornstadt, then Head of Architecture, had hooked up a powerful computer to a drafting table and was at the cutting edge of computer-assisted design. Other people in the Faculty were only beginning to dream of the kinds of analysis computers might allow.

It may be difficult for people under 50 to imagine but in the 1970s, there was no such thing as a personal computer or a mouse. A computer was a whizzing, buzzing, lights flashing contraption that occupied an entire room. At the time, Environmental Studies had four terminals that were connected to the computing machine over in the Math building.
You used it on a time-share basis. Ross Newkirk remembers that, “there was one terminal for students and one was located in an ERS faculty member’s office but no one was sure what he was doing.”

Newkirk submitted his report to Dean Nelson who promptly offered him an Associate Professor position teaching methods in the School of Planning half time and attached to the Dean’s office the rest of the time co-ordinating computing services. Through this approach, computing became a Faculty level function and stopped the four unit heads from the temptation to develop their own in-house capacity. This was another step in the integration of departments within the Faculty.

How exactly to introduce computing into the Faculty presented a challenge but a break came when then University President Burt Matthews offered to rent a building at Philip and Columbia. The FES Dean’s office moved there along with computing.

By the late 1970s and early 1980s, each Faculty had established computing capacity. The hiring of new faculty including Brent Hall, Phillip Howorth and Ellsworth LeDrew marked the addition of new areas of research, study and teaching such as Geographic Information Systems (GIS) and Remote Sensing. Ellsworth LeDrew brought the requisite skills for the use of Landsat satellite imagery, which was relevant for research on urban expansion, on agriculture and crop health, on monitoring coral reefs and many other areas. Bob Ryerson graduated in 1975 with a PhD in remote sensing, probably the first person in Canada to do so. One of the first instances where we used computing resources for research was in the 1980s. Ross Newkirk undertook research on power corridors and the installation of transmission lines to examine the impact they would have on farms, towns, and roads.

During the late 1980s, one of the Faculty’s milestone events in computing occurred. Professor Brent Hall had nurtured a good relationship with Esri, the private sector firm that supplies GIS mapping software and spatial analytics technology. In 1988, Professor Hall brokered a license agreement that was renewed a decade later and which allowed the Waterloo Faculty of Environment and the University special access to the Esri data. Waterloo was the first university in Canada to have such a site license and only...
the second in the world. Professor Hall and others were able to develop a whole curriculum based on utilizing this platform and to offer a GIS diploma. “It was and is a very big deal that has helped to differentiate GIS at Waterloo,” says Brent Hall who served as Associate Dean for Computing after Professor Ross Newkirk. Professor Hall went on to work for Esri after his retirement from the university and so the close relationship between university and industry continues and is a mutual benefit to both parties.

The introduction of computers also affected staff. Joanne Holzinger says:

There was a new expectation to produce more reports and increase our administrative roles. As technology increased, administration within Faculties took on more of the burden of administration, HR, and financial tasks. However, we welcomed a lot of these technologies because some of the tedious work became easier. For instance, with the introduction of email, it was much easier to keep connected and meant less time on the phone.

Another advance came when the School of Planning obtained a design system software from Public Works Canada, which allowed them to design streets and buildings. This software was state-of-the-art because it allowed planners to visualize design and make changes quickly in comparison to creating and re-creating blueprints by paper.

When the FES computing department was formed it was called Methods and Design. But it was much more and so the name Mapping, Analysis and Design (MAD) was coined. It is a funny name since in my experience the technical support staff lead by Marko Dumancic and Mary Burden have never been “mad” at anyone and office is usually calm.

FES advanced fast and generated more and more research uses such as spatial/mapping and data analysis using software such as ArcInfo, ArcGis and SPSS. Until the Faculty got its own main-frame we were charged by the Math Faculty for usage at what seemed like exorbitant rates. In the late 1980s MAD applied to a provincial government program for a more powerful design/mapping capable main frame to be housed in the Faculty. At the same time a large computer company, Digital Equipment of Canada (DEC) began to make machines available to the university. For DEC it was
a kind of loss leader to get students used to their products so that when they graduated they would influence their employers to buy DEC products. We are still talking about main frame/time share machines with terminals but slowly desktops with enough local power to make them useful appeared. The little Mac 2s came first but eventually Microsoft PCs took over in the labs while Macintosh remained in use for design functions.

What was happening at the University of Waterloo and in Environment Faculty in particular was in lock step with global trends and at the forefront of the history of computing.

Generations of Strategic Planning

In 1983, about the time James Bater was taking over as Dean of Environment from Professor Nelson, there was an extensive strategic planning effort. I don’t intend to go into the details of the plan now but only to note that by the time it should have come to the end of its cycle the Faculty was blindsided by events. A change in government at Queen’s Park that occurred in 1995 brought first a freeze in university budgets followed by successive years of decreased funding. Professor Paul Parker mentions that the government cut $400 M from tertiary education.

As in most sectors, salaries and benefits make up the greater part of budgets and the direct and immediate impact on the University was the reduction in personnel, both staff and academic. The reduction was accomplished in large part by offering early retirement packages to tenured faculty members and by leaving empty staff positions vacant.

That meant losing some of the senior people who had helped shape FES. Bill Shalinsky, Harry Coblentz, George Francis, Sally Learner, Andrzej Kesik, Aubrey Diem, Richard Preston, Ron Bullock, and Sandy McLellan were among those who took what they called the “golden handshake.” Environment and Resource Studies was reduced to five faculty members. Given the collective wisdom and knowledge of the people who retired, it was somewhat daunting. However, Mary Louise McAllister remembers one saving grace for ERS. She and Steve Murphy were hired but despite their retirement in the mid-1990s the founding faculty, George Priddle, Robbie Keith, Sally Learner, and George Francis did stay on as mentors. Geography lost five faculty and was only allowed to replace one. The programs, however, didn’t change. There were still courses that had to be taught. That meant bringing in adjunct professors to cover off the teaching load.

Fortuitously, in Planning the situation provided a training ground for some graduates who were then working in the private and public sectors. People like Brenton Toderian, who later became Planning Director in Vancouver came to teach professional practice. Nina Marie Lister, who was like me, a doctoral student at the time, was recruited to teach Field Ecology. She went on to become a prominent faculty member at Ryerson. Nina Marie reflects on that time:

I would say unequivocally that the path to my eventual position at Harvard (2009-2014) was directly related to the early opportunity to learn and teach alongside the likes of James Kay, George Francis, Beth Milroy etc. who were all part of the “systems thinkers” at the University of Waterloo and network which extended to Henry Regier at U of T. Without question, they gave me an inspired head start!
At the same time Garry Davidson, Planning Director in Huron County and an experienced practitioner was able to share his knowledge teaching a regular course over several years. Before a regular, tenure track position became available the situation also provided me with a total of six years of contract work. It is an ill wind, they say, that blows no good.

Some people recall the time as being in survival mode. Steve Murphy had just arrived in ERS and had the sense they were just holding on. Others recall a kind of satisfaction at how the challenge was met. At the same time, Professor Ian Rowlands recalls that the impact of the freeze and cuts ultimately prompted a new way of thinking about attracting students by establishing new and more relevant programs. But the leadership in FES had in fact not been completely blindsided and through some judicious moves, only a few staff positions were lost.

Unfortunately for her, these consequences came early in the tenure of Professor Jeanne Kay Guelke as the Environment Faculty’s first female Dean. Professor Kay Guelke also faced the challenge of adjusting to the Canadian style of university governance. Having come from the US where I am told deans wield a great deal power, she had to cope with our more consensus seeking leadership. Among Professor Kay Guelke’s accomplishments as Dean was the development of a comprehensive Teaching Assistants’ Manual.

Geoff McBoyle took over as Dean in 1997 and served until 2004. During his term a better level of funding was gradually restored. Not only were vacancies in the Faculty filled but good cases were made for additions. He was able to add eight positions while his successors, Professors LeDrew and Saini were able to appoint 16 new faculty. One of these was Dan Scott, the Faculty’s first Canada Research Chair. At a time when university departments and Faculties all over the province and country were contracting, Waterloo’s Environmental Studies expanded. In 2006 an entirely new program called Environment and Business (ENBUS) was launched with Professor McBoyle as its champion. ENBUS was available to domestic students but it was also international having students in China taking two years there before coming to Canada for an additional two years. This was dubbed a 2+2 style program.

LEADERSHIP WAS ALWAYS IMPORTANT.

Professor Richard Kelly states that:

Our Faculty has always had strong leadership, which has been key to nurturing and managing our success. Since I’ve been here we have had three very strong Deans who understand the challenges of growing our Faculty. They have made good decisions and have known when to push for our growth and how to increase the awareness of our Faculty within UWaterloo.

When Professor Deep Saini became Dean in 2006, the Faculty was stabilizing and had enough potential to grow that both a new strategic plan and an organizational shake-up were in order. Professor Mark Seasons puts it this way:

At that time, our Faculty had low student numbers and if we didn’t do something about it, we were at the risk of being amalgamated with another faculty. Dean Saini’s interventions were resisted by some in the Faculty who still wanted to keep things less formal and more organic. At that time, I was the Associate Dean working with him. During that time we were able to double our numbers, build a new building (Environment 3), and create several new undergraduate and graduate programs.
Much of the change was driven by the adoption of *Smart Green Solutions: Strategic Plan for the Faculty of Environment 2007-2014*. That document set out to affirm the original goals of the Faculty and to align our efforts with the University’s Sixth Decade Plan. It acknowledged the Faculty’s core values of innovation and quality with an outward looking perspective. The strategy was clearly the biggest change in the history of the Faculty to date and embraced two new academic centres, four new undergraduate programs, six proposed graduate programs, four new research centres and an increase in enrolment, especially at the graduate level. Climate change was to be a new area of specialization and the Faculty was to assume university-wide leadership in many aspects of environmentally focused research. Peter Deadman, the Head of Geography, characterized the plan as, “a shift in outlook amongst the Faculty in Environment towards more of an entrepreneurial and growth focused culture.”

Accompanying all of this were some name changes and some administrative reorganization. Most notably was that the Faculty of Environmental Studies (FES) became the Faculty of Environment (ENV). Geography became Department of Geography and Environmental Management or GEM for short. Changes continued during the tenure of Dean André Roy and his successor Jean Andrey. Environment and Resource Studies became the School of Environment, Resources and Sustainability or SERS. The School of Planning, having changed names in the late 1990s resisted new titling this time around. The original notion that the term “School” in a department title indicated education toward joining a professional association, e.g. Engineering, Architecture, Planning or Optometry, appears to have disappeared somewhere along the way. A new entity, the School of Environment, Enterprise and Development (SEED) was formed and included the Environment and Business (ENBUS), Local Economic Development (formerly LED, now Master of Economic Development and Innovation, MEDI) and International Development Programs. LED had existed previously but the other programs were relatively new, with International Development being developed in partnership with St. Paul’s.
Knowledge Integration

The last component of the Faculty of Environment was The Department of Knowledge Integration “KI.” KI was the brainchild of Dr. Ed Jernigan, a graduate of the Massachusetts Institute of Technology (1975) in Electrical Engineering. Professor Jernigan had joined Waterloo in the Department of Systems Design Engineering and in 1984 started working with the Shad Valley high school enrichment summer school. The Shad Valley program continues but it also spawned an even more ambitious program called Waterloo Unlimited and eventually it was decided to create a unique four-year Bachelor of Knowledge Integration undergraduate degree.

Professor Jernigan says:

In the spirit of the innovative history of the University of Waterloo, the Department of Knowledge Integration provides a home and a context for a distinctive undergraduate degree, with a commitment to integrating knowledge across disciplines. Innovative solutions and ground-breaking research happen where disciplines – and researchers – cross boundaries.

Jernigan continues, “after speaking with every Dean on campus we decided that the Faculty of Environment would be the best place to house this degree.” Since Architecture was just leaving ENV there was some concern about the Faculty losing critical mass. Deep Saini was very interested in the program Dr. Jernigan proposed and thought it would fit in well with the Faculty’s shared interdisciplinary ethos if not necessarily the subject matter. As time has passed, KI has increasingly integrated sustainability into its programming.

Dr. Robert Gorbet came to the Department of Electrical & Computer Engineering at Waterloo in 2000 and moved to KI in 2010. He became Chair after Ed Jernigan. Professor Gorbet says, “KI is about interdisciplinarity and the Faculty of Environment is probably the most interdisciplinary Faculty on campus so it made sense for KI to be housed here.” He continues, “a lot has changed in terms of how the world views environmental problems. They are no longer disciplinary. There isn’t a technological problem or solution that doesn’t have economic, environmental, and social consequences.” Placing the Department of Knowledge Integration within ENV was not just an organizational expedient but very much in the spirit of the place.
Peter Deadman, long-time Head of GEM, is quite clear in his appraisal of the current nature of the Faculty. He credits Dean Deep Saini with setting the direction. Saini was an external hire which may have been what FES needed at the time. “In some respects I have to give Deep credit for turning things around,” says Deadman.

Others also worked with Deep to help with this including Jean Andrey but I credit Deep for changing our Faculty. Before he came, I think we were somewhat stuck in our ways. He fostered a mindset of expansion, growth and innovation.

Location, Location, Location

For an academic institution, is it important where you are and what the place looks like? It is a good question to ask a 50-year old Faculty that has had several homes. At its very beginning Geography was located in rented digs on Phillip Street. Some parts of the Faculty remained there for some time, the Dean’s Office and Architecture for example. Perhaps the Phillip Street site was a fitting place for an experiment that was all speculation and practicality and part of a university that prided itself from the beginning on its “seat-of-the-pants” style.

Knowledge Integration 2017 eXhibition. KI students present their work to their Chair Rob Gorbet.

Artist rendering of Environment 2. It never quite looked like this and drew some very negative comments. However, it has and continues to serve well.
The next stop was in what is now Modern Languages and then in what was Arts 2 at the time but is now Environment 1. Bruce Mitchell recalls with fond memories when most of the FES faculty members were in one big office where they were beginning to co-operate and share. Other people say they don’t remember the one big office but everyone who was there remembers the day the ground floor of EV 1 was flooded, water pouring in through the windows high up on the outside walls.

The Social Sciences Building, named for Isaiah Bowman, was built in 1966. The Faculty of Environmental Studies moved-in in 1970. Isaiah Bowman and who he was brings us face-to-face with an issue of the 2019 era. In the 1930s, if what we can read is correct, Bowman was one of the most famous and influential geographers in the United States, an advisor to F.D. Roosevelt and President of Johns Hopkins University. However, many assert that his views were profoundly anti-Semitic. He instituted a quota limiting how many Jews could be hired at his University because he said there were already too many. Not exactly Waterloo values. So what are we to do? What was the connection between Bowman and Waterloo? There virtually is none. He was born near Linwood in Woolwich Township but the family moved to Michigan when he was eight weeks old. The name Isaiah Bowman never caught on in common use. Perhaps it is best left that way. The building became EV1.

In 1981, the building of EV2 almost doubled the floor space available to the Faculty. It also established a modest but distinct presence on the campus. Environmental Studies had reached the status of bus stop on the ring road. No one ever accused either EV1 or EV2 of being beautiful. However, over the years the adjacent Dorney Garden for native species evolved under the care of Larry Lamb, Roger Suffling, Anne Grant, and others and our little corner of the campus gained its own pleasant atmosphere.

Now may be a moment to consider the campus design and architecture. It is our immediate environment after all and to some extent it has been planned. For those two reasons FES people are surely allowed an opinion.

Those of you who know me know that I played a vocal and strident role over many years in saving the Grad House. To me, it is the most significant building on the campus. The Grad House is the one place that physically and emotionally links us to the past. It says, this was once a farm, remember where you come from. Without it, there is no “place” here. A place is a space with meaning.
The Faculty of Environment, an architectural as well as intellectual presence on the Waterloo Campus.
In my opinion, the rest of the campus is a “dog’s-breakfast” without reasoned or explicable design, made up of random, style resistant structures. However, my prediction is that 50 years in the future, the place will have acquired a patina that will be cherished by the people of that time. They will see the century old conglomeration the way we admire the haphazard but perhaps intuitive layout of English or Newfoundland villages. Furthermore, when they see LEED Platinum EV3 they will feel very much that Environment Studies has an architectural as well as an intellectual presence at Waterloo. They will feel that in the two thousand and teens, Environment people strove to create a measurably environmentally sound place to work and study. It was truly a medium is the message moment.
Chapter 3

Key Contributions of the Faculty to Environmental Research and Practice
UNDERSTANDING THE ENVIRONMENT

In the first chapter, I talked about the state of the world that Canada found itself in during the late 1960s. It was volatile and uncertain yet resiliently optimistic, especially about the possibilities of saving the environment. While there were obvious outside forces at work politically and intellectually, the Waterloo response was unique, locally led, firmly founded in strong values and characteristically Canadian. Gordon Nelson reflects that, “it is very important to recognize that much of the thought and impetus leading to the Faculty came from the experience and knowledge of a key group of people who were in the right place at the right time.” He refers to Ralph Krueger, Len Gertler, Bob Dorney and George Francis as being somewhere between the four wise men and the four troubadours.

We will see that in the 1970s and 1980s a second wave of innovators arrived to carry on the work of the founders.

Phrases such as “saving the environment” are relatively easy to throw around but nailing down precisely what that sentiment means is a more complex matter. A great deal happened to a large cast of people over the last half century and to appreciate the scale of it, we might focus on some themes or sub-themes.

I have identified five:

1) Applied Research
2) Interdisciplinary Inquiry
3) Advocacy
4) Community Focus
5) Evolving Healthy Communities

By examining each of these ideas in turn we can get at least a notion of how the Faculty of Environment contributed to what amounted to the invention of Environmental Studies as a subject and the practice of Environmental Planning and Management. We will be able to comprehend how the product became something much more than the summation of its parts.

Phrases such as “saving the environment” are relatively easy to throw around but nailing down precisely what that sentiment means is a more complex matter.
1. Applied Research

Applied research “aims at finding a solution for an immediate problem facing a society, or an industrial/business organization, whereas fundamental research is mainly concerned with generalisations and with the formulation of a theory.” (Kothari, C.R. 2008 Research Methodology: Methods and Techniques, New Age International). For many in the new Environment Faculty the prime focus of inquiry was going to be problem driven. Another way of stating the approach is this: when a decision has to be made in the real world, e.g., a municipal council, government department or industry, then research results should be able to shed light on the issue at hand. Several informants, including Professors Bruce Mitchell and Dr. Sandy McLellan, say categorically that it was the opportunity to do applied research that attracted them to Waterloo in the first place. Reinforcing the applied approach was no doubt the intent of Arts Dean, Norman High while he was responsible for Geography even before the formation of FES. Professor Sandy McLellan suggests High had probably been influenced by Rachel Carson’s, Silent Spring.

The question remains, however, what does applied research actually look like. For one of ERS’s early students, Tony McQuail, it was most direct. His ambition was to farm and he had acquired a property even before he graduated from Waterloo. He relates that, “during my degree I was actually able to do field research on my farm (e.g., woodlot analysis and water analysis). So I was able to incorporate my own farm into my academic studies.” For most people it was not quite so immediate. Sandy McLellan’s doctoral thesis concerned pure research on glacial geomorphology but you don’t have to be an expert to see that a glaciated valley looks a lot like an abandoned gravel quarry. A big wall of ice does pretty much the same to the landscape as a tribe of bulldozers. “I very quickly discovered the connection to deglaciation and the aggregate mining industry,” says McLellan. What he learned about glaciation could be put to use remediating the landscapes of played out-gravel pits.

The impact on students of these ideas of applying research results, is well expressed by Jamie Bastedo who went on to have stellar career in the North. He recalls arriving at Waterloo when the Faculty was just 10 years old.

I had a conventional undergraduate in Biology that didn’t steer me in any particular direction and I basically parachuted into this program. And there I was, learning from great minds like Bob Dorney, George Francis, Gordon Nelson, Chad Day, and John Theberge. They introduced me to a world of environmental planning and policy – things I had never dealt with as a biologist. At first, it felt scary and I had to figure out where this knowledge fit into my world. The courses I took with these people were very heady and provided me with an overview of the landscape and of urban and rural realities. These people were heavy hitters thinkers and I just remember that I was straddling two worlds. I was moving from biology courses to the world of planning. Planning became a bridge to a more applied world where information about the land and land use issues could be applied to real world decision making and policy development.

Another of many examples is the work of Professor Mike Stone. He spent many a summer canoeing down the Coppermine River in Nunavut collecting riverbed samples not primarily to know about
Arctic conditions but to have pristine data to help him understand river and storm water sedimentation in the populated south of Canada. The same notions were true for sociological and attitudinal surveys that were conducted by FES colleagues like Susan Wismer, Laura Johnson, Beth Moore-Milroy and myself concerning housing, urban safety and cultural planning. The approach was always, what is the problem, what are the decisions to be made and can I illuminate the issues with sound data.

Bruce Mitchell recalls that there was a real sense of enthusiasm and energy:

The potential was very exciting, to be in a new Faculty that was environmentally oriented and which also had many faculty members with an applied orientation. I thought it was pretty neat that all of the staff for Geography and Planning were in one big office in the basement of EV1. It gave us an opportunity to chat with each other often and a lot of good things came out of the discussion.

Professor Geoff Wall agreed. “The division between ‘pure’ and ‘applied’ research,” he says, “was never strong and, in fact, could inform each other.” Others were somewhat less sanguine. While it was true that there was tremendous enthusiasm in the departments with new members and the opportunities for applied research, Sandy McLellan said, “there were still tensions between ‘pure geography’ and ‘applied geography.’” There remained a distinct separation of attitudes. “We used to hold debates on applied vs. pure geography and that argument went on for years!” He said that regardless, it was an exciting time, “because we were developing everything from the ground-up and had tremendous freedom to innovate.”

2. Interdisciplinary Inquiry

If applied research was being hard-wired into the Environment Faculty ethos during the 1980s then the app of choice in the 1990s and 2000s was the interdisciplinary approach. Challenges in the environment were too complex and often “wicked” and not susceptible to being addressed by research aimed at theory. Yet there was still this stigma that something
was wrong with applied research despite the environmental revolution and the growing realization that interdisciplinary studies could come up with solutions. Bruce Mitchell says that, when FES tried to forge links with Biology, the Dean of Science at the time was not interested. “He thought that any credible biologist should be in a science Faculty.” However, later on attitudes were changing, if slowly when Dr. Barry Warner, “an alumnus of Geography and a wetland ecologist was hired in Geography with a cross-appointment to Earth Sciences and Biology.” In the meantime, the lingering prejudice and the lack of collaboration resulted in the hiring of more Biology-trained ecologists initially in Planning. This included Bob Dorney, George Mulamoottil, John Theberge, Roger Suffling and Murray Haight. Later in three of the Faculty’s five units, the School of Environment, Resources and Sustainability; the School of Planning; and the Department of Geography and Environmental Management, more people with ecological backgrounds were hired.

They taught applied ecological principles related to land use planning, regional planning, waste management and environmental management. This made the Planning School quite different in comparison to other planning schools in Canada. It also reflected the idea that, while being respectful of disciplines, it was also important to recognize that students working in the environmental field would be better equipped for work if they were exposed to more than one profession and discipline. “The approaches,” says Geography Professor Geoff Wall, “were always eclectic and pragmatic with no particular methodological approach espoused.”

Professor Clarence Woudsma, long-time Director of the School of Planning, believes that interdisciplinary thinking was a part of the origins of Environment. “Look back at the 1969 description of the Faculty,” he says. But by the 2000s this concept of interdisciplinary research started emerging and the language of interdisciplinary studies became more prominent. Dr. Woudsma continues, “this is what I think made the Faculty ground-breaking and innovative when it was established, because it did identify this notion of interdisciplinary inquiry when it was first established even though it may not have been called that at that time.”

When Professor Roger Suffling was teaching students about measuring dates using tree rings, it was to derive information about the history of forest fires. That knowledge allows planning for future fire events.
In terms of disciplinary shifts and changes over time, the creation of the Environment and Business program and, later, the School of Environment, Enterprise and Development (SEED) were not only innovative but also an embodiment of the interdisciplinary ideal in their very organization following what ERS had done decades before. To focus on the environment first and then business is what we should be doing instead of simply tacking on the concept of environment at the end of decision making. Environment is central to the teaching in SEED.

That was a really important shift. Sandy McLellan agrees whole-heartedly with this notion:

As the need for interdisciplinary perspectives to solve environmental problems gained attention, it began to shape how we undertook research and the need to make it more inter-/multi-disciplinary. Professors across departments started to collaborate and design interdisciplinary “packages” of research, which then began to change the whole granting process for research projects.

The former Director of SEED, Professor Neil Craik, puts it this way:

Although its not structured this way, the way our Faculty tends to operate in terms of research has changed. We look at research less through the lens of disciplines and more through the lens of particular problems like climate change. We are seeing this trend more at big research institutions.

The interdisciplinary freedom nurtured in the Faculty of Environment at Waterloo is significant. This is clearly expressed by Professor Simron Singh when he talks about what attracted him here:

I came to UWaterloo from Vienna, Austria after working there for more than ten years. I heard from a colleague about all the great work happening in the Faculty of Environment, so I applied for a job opening. The work I was doing in Vienna was collaborative but we were often working on issues like sustainability within a fixed paradigm where there were very clear rules about moving beyond the paradigm. This approach...
provided me with a lot of depth and rigor in what I was doing, but we were also risk averse, especially when experimenting with new knowledge. Coming to UWaterloo was an opportunity to explore and experience another way of thinking and doing things.

Professor Christine Dow, Canada Research Chair NSERC in Glacier Hydrology and Ice Dynamics and a relatively new faculty member in GEM says that: “It’s really valuable to be able to combine both the natural and social science perspectives. That’s a fairly unique approach. I don’t think there are that many Faculties where this dynamic exists under one roof.”

What this looked like in detail was SSHRC and NSERC applications with several co-investigators, one bringing statistical expertise, another having traffic engineering knowledge and yet another contributing social survey skills. Clarence Woudsma remembers that:

Around this time (2008) we had transitioned from the Faculty of Environmental Studies to the Faculty of Environment. The name change seemed to reflect a maturing of the perspectives of what it meant to study the environment. For instance, the difference between “science” versus a “study”, academically speaking. Changing the name to the Faculty of Environment signified that we weren’t just about qualitative or policy oriented study of humans and the environment but that we did both science and social science and included humanities perspectives as well.

This evolution was not without its challenges. The process of Tri-Council grant application evaluation was a Byzantine Labyrinth to double up my metaphors. Traditionally there were panels of experts for subject areas so historians evaluated historical research proposals, psychologists judged psych research and so on. As I recall there was no subject area called “planning” and I’m not sure there was “environment” either. There were “interdisciplinary” panels but often that meant that the different members may not have had a clear grasp on the nature of the research being proposed. Also there were always limited funds and grant evaluators may have been tempted to plump for research in their own areas. Gradually, however, that situation is changing for the better.

Professor Robert Gorbet, Chair of Knowledge Integration sums it up very well when he says:

The university is increasingly focusing on interdisciplinary studies and there is an opportunity for the Faculty of Environment to be a leader in that respect. The nature of the environmental problems we are dealing with increasingly require an interdisciplinary perspective. For KI, we don’t just teach interdisciplinarity but some of us actually study what interdisciplinarity looks like. I think there’s an opportunity for KI to be advisors and trainers of interdisciplinary study across campus.

### 3. Advocacy

Virtually everyone has opinions about specific issues such as building a pipeline or about general policies like taxing carbon emissions. This right to opinions is a feature or perhaps the essence of democracy. When people feel strongly about issues in our society they also have the right to advocate for their position through processes like petitioning, voting, lobbying and demonstrating. There is an infinite number of motivations for advocacy, some noble and some unhelpful. What is special about those
of us employed in research institutions is that we are expected to base our opinions on accurate information and logically defensible analysis. That doesn’t prevent an academic from advocating on behalf of causes. Arguably, access to research funding, the accumulation of subject specific knowledge and the privilege of tenure protection, both enable and require university faculty members to engage in and to inform public discourse. If advocacy is a right for all, it is an obligation for academics.

Those outside the tradition and culture of research often believe that the views of academics have the self-interested motivations that are common elsewhere. Many if not most ENV faculty members have faced this dilemma. When an academic is seen as a proponent or opponent of some policy or regulation, it becomes easy for opponents to argue that their research was biased in favour of the results the researcher desired. When Ralph Krueger went from conducting research on agriculture to being the voice of the Preservation of Agricultural Lands Society (PALS) and proponent of land-use regulation was it just his opinion? When Len Gertler and Bob Dorney were providing the ecological rationale for recognizing the Niagara Escarpment as a unique biosphere, were they just crusading for their own ideas? Is climate change just a personal interest of Professor Dan Scott? Of course not.

There are two counters to the argument that scholars’ opinions are not special. First is the careful conduct of one’s research and the second lies in the process of peer-reviewed publication. In conducting research, therefore, it is vital to be rigorous with the methods and to remain neutral with regard to the results. It must be clear that anyone following the methods would reach the same results. Similarly, if the results are not favourable to the side of a debate you, as an individual may favour, you must nevertheless discuss those results. I, and many colleagues have found ourselves in such cases and a couple of these will be outlined presently.

The journal publishing process provides a further guarantee of validity. For those who are unfamiliar with the protocol, it works like this: when a research paper is submitted to a journal, the double blind system is generally followed. That means that the paper is reviewed by two or more persons with related expertise. The reviewers don’t know the author(s)’ identity and the author(s) do not know who the reviewers are. If an article describing research findings passes this process and is published, the author(s) can legitimately claim the robustness of the results. There is a similar process in place for evaluating applications for research funding.

The proviso is that university researchers must conduct sound and transparent research and base their advocacy on research results and not personal opinions. Over the years, during which the Faculty of Environment has matured, these principles have guided the public interactions of the faculty members.

4. Community Focus

It is fine to support applied, interdisciplinary research that underpins good public decision-making and informs advocacy within that debate, but it has to exist in a context. The context in which a university Faculty exists is the greater community or perhaps we should say communities since there are many depending on one’s definitions. We can define communities geographically, such as municipalities, the province or the country, we can think of them in terms of interests such as the Field Naturalists of Ontario, the Planning Institute or the Architectural Conservancy of Ontario or we...
can imagine them culturally such as First Nations. Communities can also be combinations of these so a First Nation might be a territory as well as a cultural entity. The Faculty of Environment interacts with a wide variety of communities and always has. The communities are both the source of environmental questions and the end users of the research generated.

Attempting to list the community partners of FES would be unwieldy and if I tried to be comprehensive I would inevitably overstate the importance of some and risk missing the meaningful contributions of others. Instead I am going to plagiarize (with permission) an accounting prepared by Emeritus Professor George Francis and make a few additions from the suggestion of others and from my own flawed memory. The headings here refer to community in the broadest sense.

Parks and Protected Areas

Gordon Nelson established the Heritage Resources Centre (HRC) in 1984 in a partnership with Parks Canada. Involving other people such as George Francis, Bob Dorney, Larry Lamb, John Theberge, and George Priddle along with a regiment of graduate students, volumes of research were produced. One highlight was the nomination of the Grand as a Heritage River. Nine students were involved in the project from ERS, Geography, Planning and History. I became Director of the HRC in 2003 and emphasized the importance of protecting human heritage as well as biodiversity. Between 2000 and 2016, the HRC produced a stream of award winning research on such issues as heritage designation and property values, the demolition rate of heritage protected sites and the economic of adaptive reuse. Professor Michael Drescher carries on the work with a renewed focus on ecological issues.

An early initiative in the protected lands file was to work with regional planners from the newly created Regional Municipality of Waterloo (RMW). The objective was to identify for protection, local sites of natural significance. Early discussions to identify criteria for “ecologically significant areas (ESAs)” and the much needed time for field work to go along the back roads and down the Grand River and tributary creeks involved the volunteer work of local naturalists. The main result after a couple of years was the creation of an Ecological and Environmental Advisory Committee (EEAC) for the RMW to help assess plans or proposals for development for compliance with ESAs, or what modifications would be required. Professor Francis chaired the EEAC for several years during the 1970s. An up-graded version of this committee still operates in the RMW, and Greg Michalenko (an FES retiree) is currently a member.

**Professor Greg Michalenko** is probably toasting someone else in this picture but it is his community work over the years that deserves our congratulations.
The Nature Conservancy of Canada

Professor Francis served on Board of this organization and facilitated numerous graduate students’ contributions in the field. He is a life-member of The Nature Conservancy and a Member of the Ontario Natural Heritage League, Member of the Canadian Council on Ecological Areas and from 1991 to 1999, an Advisor on biosphere reserves for the Canadian Commission for UNESCO (1980-2010), and has extensive involvement in the Canadian Biosphere Reserves Association.

Great Lakes

Dr. Francis was involved in various Great Lakes organizations and issues for about 30 years from 1971 to 2008. Included were membership on the International Joint Commission (IJC) Science Advisory Board, the Great Lakes Fisheries Commission (GLFC) Science Advisory Board, and various Canada/US inter-university research projects. Thinking through a Great Lakes Ecosystem approach to water management, fisheries management and coastal zone management issues were the main pre-occupations. Rob de Loe has taken up several of these recurring themes/issues in his current work with the IJC’s Water Quality Board.

Canadian Arctic Resources Committee

The Association of Canadian Universities for Northern Studies and the Federal Department of Indian and Northern Affairs worked together over many years to secure annual grants for training of students working under faculty in the North. Robbie Keith, of Man Environment Studies, participated strongly in this endeavor and later became a national leader with the Canadian Arctic Resources Committee in Ottawa. Professor Nelson recalls that:

This program was approved by the President of the University and resulted in the securing of about $40,000 annually, which was allocated to about 20 students each year for a number of years. The faculty, staff and students increasingly participated in these various activities and the gradual coming together of the Faculty’s work.

Much of this work was stimulated by Northern Frontier Northern Homeland, The Report on the MacKenzie Valley Pipeline by Justice Thomas F. Berger in April 1997. Former FES students Terry Fenge and Jamie Bastedo became quite involved in this effort.

Complexity Studies

This subject has a huge literature and a wide following of practitioners interpreting the significance of complex phenomena for a globalizing world. Early adherents of this at Waterloo include James Kay (ERS) and Thomas Homer-Dixon of The Waterloo Institute for Complexity and Innovation (WICI). Professor Dawn Parker, School of Planning, has more recently headed WICI.
Pragma Council

Professor John Horton was the founder and guiding force behind a unique organization called the Pragma Council. While it was never confirmed, I believed that Pragma was a made up name based on the concept of pragmatism. A core of Waterloo graduates, who by the 1980s were both successful in their careers and prominent in the planning field, supported Pragma. They held mini-conferences twice each years to discuss current issues. The invited guests often included cabinet ministers, mayors, developers as well as researchers. Students were invited to sit in and even to participate in the discussions which were off-the-record and therefore often more frank and open than official meetings. The Council was a very special type of community. Pragma continues to make significant contributions to the School today.

Co-operation with Indigenous Peoples

Only a small number of Indigenous students, such as Cherie Brandt who graduated from Planning and went on to career in law, have attended Faculty programs. It is hoped that will change in the future. However, individuals of various backgrounds from FES have had a long history of interacting with First Nations. Kevin O’Reily recounts his experience:

I went to Yellowknife in 1985 to work for the Dené Nation who were thought to be fairly radical and cutting edge at the time in terms of advocating for Indigenous rights. They took a firm stance against a proposal for the Mackenzie Valley pipeline in the 1970s. I had a strong interest in learning about the Dené, their values and their connection to the natural world. These values had seeped into me when I was at UWaterloo.

About a decade ago some FES research was initiated with the Attawapiskat First Nation along the north shore of the Albany River in north-central Ontario (the town was flooded every spring as ice flows blocked the waterflow). Dan McCarthy (SERS) has continued with some related studies on this situation. He has also engaged with the Haida Gwaii communities in off-shore BC, in part due to his association with The Waterloo Institute for Social Innovation and Resilience (WISIR). Informal co-operation on indigenous issues in the Waterloo region and beyond are occurring among several academic units. Particular partnerships have been undertaken more recently with the Mississauga of New Credit First Nation.

Collaborative Eco-Research

This was a $2.1 million project. Even though George Francis was officially the “Principal Investigator,” faculty members and grad students from all across UWaterloo participated. The eco-research project worked well because it had a very able Secretary seconded from the Grand River Conservation Authority (GRCA), community advisors including the Mayor of Waterloo, a senior administrator from GRCA, and informally others working with the UWaterloo research groups. It really succeeded because given the scope of this initiative, all the participants from departments across UWaterloo could see their own interests in contributing and gaining experience.

From the very earliest time, this initiative spawned other partnerships. For example some of the first people involved, George Mulamootil and Len Gertler, founded the consulting firm ECOPLAN which is still in business a couple of generations later.
In the Faculty of Environment, there has long been an emphasis on working with communities at various levels. Quite often, that has meant providing research results that are immediately useful to community leaders. Here students are sampling water quality in a local stream.
Community University Research Alliance (CURA)

In the early 2000s, one of the initiatives that spurred new collaborative projects among faculty members was the awarding of a Community University Research Alliance grant from SSHRC. The CURA secured funds for research that was in direct response to local problems that fell within the purview of municipal administrations. A joint committee that included representatives from local governments and the University selected projects and administered the grant. At the same time, the Faculty created a new institute for the study of Small and Medium Sized Cities, defined as those cities between 50,000 and 200,000 populations. The notion was that these cities had their own needs and dynamics and simply scaling down research from major metropolitan areas and applying the same solutions was not working.

While the grant was not renewed and the Centre for Small and Medium Sized Cities did not prosper, a great deal was learned and many good projects were undertaken. Among the most instructive studies were Pierre Filion and Trudi Bunting’s investigation of what made the core areas of some medium sized cities successful. Data was gathered from dozens of cities. Kingston, Ontario and Rochester, Minnesota, home of the Mayo Institute, were among a small group whose downtowns were working. A number of helpful principles were distilled from the study.

What we also learned, somewhat painfully, was just how contentious research on urban issues could be. Professor Rob Feick and I set out to explore what had happened to various “visioning” exercises conducted in Waterloo Region. These were public participation projects where participants were assured that their input would help guide future planning. Considerable amounts of money had been spent on these efforts. Five years after the Visions were published, at least one municipality could not even find their files on the subject and when we consulted the citizens who had participated, there was widespread disappointment with the outcomes. Needless to say, when we published the results there were some very unhappy planners who did not like the outcomes.

Similarly, when other researchers found that virtually all the social services for distressed people were located in Kitchener and none in the City of Waterloo, local politicians were embarrassed by the findings and tried to have the reports suppressed. In both of these cases it was the local press who brought the stories to the wider public. I can only emphasize that a lot was learned and in fact many other collaborative research projects between municipal governments and FES have been conducted over the years.

Waterloo Public Transportation Initiative

Professor Jeff Casello formed the Waterloo Public Transportation Initiative (WPTI) in 2010. It consisted of a common work space for a group of grad students who were available to take on consulting work, primarily jobs that are not profitable for private consultants. Such projects are often perfect for student learning exercises. Under Professor Casello’s direction they have done work in Canada for: the City of Waterloo, Waterloo Region, Hamilton, Burlington, London, Kingston, Toronto, and Metrolinx. They have also worked in Mexico City, Mexico. Dr. Casello and his students were instrumental in designing the highly successful
express bus system for Kingston, Ontario. This initiative has since evolved into one of the Faculty’s research clusters with an overall theme of transportation, bringing together graduate students and faculty members working on aviation, trucking, public transport and transportation safety.

Support to Nearby Municipalities

Marko Dumancic explains one of many special relationships that FES has had with municipal governments in Southern Ontario. In the 1980s, the Methods and Design Department, later renamed MAD, held all the GIS planning data for Haldimand-Norfolk Region including property ownership, locations, descriptions of structures, values, zoning, etc. “This data,” Marko says, “was maintained by FES initially for research purposes.” However, Methods and Design then became the de facto data center for Haldimand-Norfolk County. “We helped to run reports and calculations on planning related issues for the county.”

The Canadian Institute of Planners (CIP)

The community of professional planners was a group that long maintained a special relationship with the Environment Faculty at Waterloo. There was a time when only two or three EV Faculty members were full professional members of CIP as a result of the retirement of many of the original School of Planning professors. That situation changed when seeking membership in the Planning Institute became a requirement of faculty members. Nevertheless, as often happens, the interaction with the Institute was largely due to the efforts of one person. Professor Mark Seasons served as President of the national planning
organization in the early 2000s and remains a leader in the Association of Canadian Collegiate Schools of Planning (ACCSP). He has the prestigious title of Fellow of the Canadian Institute of Planners (FCIP). Both Professor Seasons and your author have served on the Editorial Board of Plan Canada, the official organ of the Planning Institute.

One incident stands out in particular with regard to the CIP. Professor Seasons and I were part of a task force charged with creating a Continuing Professional Development (CPD) policy for the Planning Institute. This process operates in most professions and is designed to keep members up-to-date by requiring ongoing study. The task force met in Winnipeg. Mark and I brought up the matter of the word “development” in CPD. The term is relatively neutral in most professions but in planning, development is a somewhat “loaded” term. It was decided to call the policy, Continuing Professional Learning when applied to planning and so it is CPL to this day.

At the apex of the connection between planning and legislation there are institutions designed to adjudicate the inevitable impasses that occur. Two of those bodies have been the Ontario Municipal Board (OMB) and the Environmental Appeals Board (EAB). Interaction between professional planners and these tribunals is significant enough that a fourth year class on “Tribunals” has long been a core course in the School of Planning. Significantly, EV faculty and alumni have served as members. For example, Len Gertler was a member of the Environmental Appeals Board, later renamed the Environmental Review Tribunal (ERT) and Frank Watty served on the OMB. Dr. Bruce Krushelnicki not only served as an OMB member but he wrote the text book on the Board and was instrumental in bringing about the current reforms that have replaced the OMB with the Local Planning Appeal Tribunal (LPAT).
The Interdisciplinary Centre on Climate Change (IC³)

Established in 2008, IC³ advances research on climate change by bringing together experts across disciplines under direction of first Claude Duguay, and then, Dan Scott. The centre takes a fresh approach, built on smart science, working toward achievable solutions. Such solutions come from facilitating interdisciplinary research and providing relevant scientific information that empowers business, government and civil society to prepare and respond effectively to weather events and climate change. Through the Department of Geography and Environmental Management, the centre supports a Master's degree in Climate Change (MCC). In 2018, IC³ was designated a “University Centre” and is planning its move to the green EVOLV1 building on north campus.

Global Food Security and Sustainability

Problems of adequate and reliable food supply not only endanger environmental sustainability, but future food security as well. However, despite widespread recognition of the need for environmentally sustainable food production, incorporation of environmental sustainability goals into global food security and governance arrangements have been weak and uneven.

Dr. Jennifer Clapp, Canada Research Chair in Global Food Security and Sustainability, aims to improve the links between environmental sustainability and global food security governance.

Wetland Restoration

Wetlands cover 12 per cent of Canada, and provide essential ecosystem services, such as regulating floods, taking up greenhouse gases (GHG), and filtering sediments and contaminants from water. Over 70 per cent of wetlands in populated areas of Canada are gone, and those remaining are threatened by climate change and development pressures including extraction.

Professor Maria Strack, NSERC Canada Research Chair in Ecosystem and Climate conducting field work on Western Canada’s other black gold.
The Faculty of Environment provides a hub of expertise on natural processes in these dynamic and stressed environments. Much of the research is field-based with sites across Canada, especially in the boreal zone, but this is complemented with laboratory-based experiments that stimulate field-scale problems. This research has contributed to the development of widely accepted methods for restoring/reclaiming wetland ecosystems, including those impacted by oil-and-gas and oil-sands developments.

5. Evolving Healthy Communities

When I stand back and look at the remarkable contribution the Faculty of Environment has made, there is a term that comes to mind although I’ve only heard it a couple of times through our interviews and consultations. The term is Healthy Communities and means, “creating the conditions for health rather than treating the symptoms of sickness.” It is true that pursuing research to solve defined problems has been the principal modus operandi of the Faculty but I believe that was generally done in the hope of creating a better environment. It might be a good notion to guide our future direction as it seems to have been a silent but influential precept of the first 50 years.

This then is the fragmented and incomplete story of the intellectual and organizational contribution of the Environment Faculty to Canadian life and letters. It has been and continues to be a remarkable story. As Former Dean, Gordon Nelson reminds us:

Too often, we Canadians fail to give our people credit and frequently seek the origin of fruitful new initiatives in the US or UK. We need to recognize our own experience, awareness, competence and expertise. The Faculty of Environment is one strong instance where this should be so.
Chapter 4
Preparing Leaders of Tomorrow
I don’t think I can remember reading a Master’s Thesis or Doctoral Dissertation that did not, on the Acknowledgements page, recognize the contribution of staff to the student’s ultimate success. “The unique thing about UWaterloo,” wrote Dr. Isaac Mwangi “was the support staff, e.g., Ms. Adams, Ms. Cardwell. The support staff really helped me as an international student and that made me feel more at home.” Mwangi went on to become the East Africa National Expert for the UNDP, Head of the University of Nairobi, Planning School and co-founder of the Kenyan Professional Planning Institute. He is one of countless successes in Waterloo’s role in preparing leaders.

A student has at least two kinds of experiences at university. One is their life experience and the other is their learning experience. In the Waterloo Faculty of Environment the latter concept was turned around. The learning experience became “experiential learning,” an idea that I will explore below. But first I think it is important to examine the more intimate, day-to-day life of those who have come to us to learn.

The Faculty of Environment Staff

The impact that professors, thesis advisors, teaching assistants, lab supervisors and other academic staff, have on a student are obvious enough and are the subject of many other sections of this story. However, it is the non-academic staff who often shape the day-to-day life of undergrads and grads alike.

It begins at the unit level which is what Isaac Mwangi was commenting on in the quote above. The program administrators advise students on everything from course selection to where to pick up used furniture for rented apartments. They keep track of all students’ progress. Often as well they are the resident shoulder to cry on. I remember once when the undergrad administrator, Linda Youngblut, came to me with a file. A student had been required to withdraw from the program for two terms due to low marks. She had advised the student to apply for re-admission explaining how they had analysed their problem, what measures they had taken to ensure their future success and what they had done with their time out of the program. This was the kind of careful advice students regularly received from the staff advisors. She showed me the student’s reply. He admitted that time management was his problem. He said he had taken a job in a pizzeria and there had learned how to schedule activities. He got good enough at it that the owner made him a shift manager. He was quite sure he would now be able to organize his time and graduate. He finished the letter saying that the other night someone drove their car through the front window of the pizzeria and made off with the night’s receipts. As he sat in the broken glass on the floor he thought it was time to return to Environmental Studies.
It would be wrong to imagine that everything in the Environment Faculty was serious and businesslike. Consistently over the years, people in ENV have had fun. The staff has generated much of the light-heartedness. Here Joanne Holzinger and Susan Shantz are collecting dollars for admission to the “Tulip Tea” at which David Walker sang “Tip-toe Through the Tulips” in falsetto like Alice Cooper. The picture must be from before 1989 when $1 bills ceased to be circulated.

Ecology Lab Director Larry Lamb, literally hugging a tree during a field class.

I will not try to name particular staff members since I would be sure to miss important individuals but what is clear is that the students remember and when I’ve met alumni away from Waterloo they invariably ask after the people who helped them on their way. Of course the unit staff support the academic members as well but probably their prime role is the welfare of the students. At the Faculty level there may have been less direct contact with students but the wellbeing of the grads and undergrads also rested on the efficiency of the Dean’s Office. In this regard, I will mention four people Helen Bensusan (later Kilbride), Barbara Yeaman, Joanne Holzinger and Faye Schultz. The position title may have changed and the exact reporting relationship altered but we can say that these people held senior administrative positions in the Faculty. Each in their time set a tone of strong, competent and dedicated leadership in the Dean’s office. Services that worked across the Faculty include Finance, Advancement (fund raising), Research Co-ordination, External Relations, Alumni Affairs and International Projects.

Working somewhat independently but still under the direction of the Dean’s Office have been several service units that continue to support both faculty research, teaching and student projects. Mapping Analysis and Design (MAD) is the largest along with the workshop and the various labs. For many years by Larry Lamb ably directed the Ecology Lab which was and is now headed by Anne Grant. For at least part of the history of Environment, the responsibility for international projects has been handled at the Faculty level. Drew Knight, David Wood and Fulu Mao were among the people who facilitated these global efforts.

The technology has changed from the pre-digital days of dark room photography and mainframe computers but the best available equipment and skills have always been there to backup people’s work.
The University Staff

Removed a further degree from students’ day-to-day lives are the university level institutions such as the Library, Office of Research, Ethics, counseling, disabilities, security, building maintenance and plant ops. Some examples will tell the tale. In my experience the library never hesitated to acquire a book I ordered either for myself or for a student. For many years the University Map Library was housed in EV1 under the direction of the affable and always helpful Richard Pinnell. Applying for grants and negotiating contracts was always a mine field. The staff in the Office of Research were and are consummate professionals who enabled the nearly impossible to be done. ENV faculty members have probably been the most creative and entrepreneurial when it comes to funding. Therefore, they have caused the most headaches for the Office of Research. I have had funding partners tell me that they have tried to work with other universities but none have been as flexible and goal oriented as Waterloo. Many of the student projects I will be referring to presently required Research Ethics approval and sometimes the turn-around times were very tight. The Ethics Office was always efficient and accommodating.

Unfortunately the pressures of study and personal life can cause stress for students that requires professional counseling. That service has been available in the case of crises but counseling services has also worked proactively to increase awareness and prepare faculty and staff for the problems they inevitably face. The Office of Students with Disabilities, now called Accessibility Services, is another of the vital services operating within the University administration. Their efforts to accommodate students with special needs in as seamless a way as possible are admirable.

It was easy for a lecturer to wear a mic in a class where students with hearing impairment could record the instruction.

Security within a university is a delicate matter. We all want openness and ease of movement. Especially Architecture and Planning students, working on design masterpieces, seem to depend on delivered pizza and do their best work between midnight and dawn. So it was difficult when I was working late myself one night and came across a visitor sleeping under a set of stairs. I say sleeping but it was more like camping since it turned out the person had been resident there for weeks. Once called the Campus Police handled the situation very sensitively.

In my list of support services I mentioned building maintenance and plant ops. A number of years ago a famous university administrator visited Waterloo. He had written a book. The measure, he said, of an effectively run university would be this: if you came to the campus in the middle of the night, stopped in an otherwise empty hallway and asked the cleaner what is the purpose of your job, the person would say, to support learning. The floors are cleaned and the trash emptied to make a good environment for learning. Everything is done to make a good environment for learning. I don’t know what the outcome would be if we tried that test but I’m pretty sure that most of the University staff have a very clear idea of what they are doing and why.

Experiential Learning

Once I was asked to contribute to a geography course at Wilfrid Laurier by giving a couple of lectures and conducting an exercise. I was asked to sign off on a form that this was a Community Services Learning course (CSL).
I explored and found out that if a course at WLU involved any contact outside the university it could qualify for the label, CSL, a kind of good housekeeping seal of approval. They even had an office with instructors to show people how to do it. Now I don’t mean to take anything away from our colleagues down the street and I think their CSL initiative is OK, it’s just that in over 20 years of teaching in the University of Waterloo Faculty of Environment I don’t think it ever occurred to me and most of my colleagues to teach any other way. We didn’t need an office to promote it. If we had a name for it then it would be experiential learning.

“Our focus on applied research” said Professor Sandy McLellan, “allowed us to bring real-world scenarios/projects into the classroom. For example, introducing my students to actual land-use plans from research projects to demonstrate applied/solution-based research.” George Francis recalls that:

UWaterloo itself was founded in 1957 as an innovation that combined academic studies in Engineering, Math and Computer Studies interspersed with work experience … This became the much-advertised Co-operative Education program with a university staff recruited to find and keep contacts with companies and screen students for placements.

<table>
<thead>
<tr>
<th>TYPE OF LEARNING</th>
<th>CONDITIONS</th>
<th>FUNDING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Co-op (primarily undergrad)</td>
<td>Direct employment for one or two consecutive terms with total of five employment terms to qualify for co-op degree – administered by co-op department</td>
<td>Negotiated salary from employer</td>
</tr>
<tr>
<td>Internship</td>
<td>Individually arranged work experience of varied duration; required for some graduate degrees</td>
<td>With or without employer funding</td>
</tr>
<tr>
<td>Project Courses</td>
<td>Course where teams of students undertake project from concept through analysis to methods and conclusion – always focused on actual site or problem</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) No direct contact with people outside class</td>
<td>No funding</td>
</tr>
<tr>
<td></td>
<td>b) Contact with a client, e.g. a planner, who advises</td>
<td>No funding</td>
</tr>
<tr>
<td>Grad Theses</td>
<td>Work done primarily to complete thesis</td>
<td>No funding</td>
</tr>
<tr>
<td></td>
<td>a) Engagement with outside advisor and/or public</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) Support from academic advisor as a Research Assistant – money from larger research grants or program such as MITACS</td>
<td>Funded full time or part time</td>
</tr>
<tr>
<td>Contracts</td>
<td>Working for a client under direction of academic advisor but outside degree requirement and with a project deliverable e.g. a report to client</td>
<td>Usually full time with competitive salary</td>
</tr>
</tbody>
</table>
McLellan’s use of actual documents in classes and Professor Francis’ apt description of co-op represent perhaps the two extensions of the experiential learning ideal. However, there are many other variations, all of which have flourished in the Environment Faculty. The accompanying table lays out the different approaches.

Co-op – Direct Employment

Much has been written about Waterloo’s signature co-op program and here I will just highlight some of the aspects that relate specifically to the Environment Faculty. The idea of having students working every other term in real jobs related to their formal studies was pioneered in a few American universities, notably Cincinnati in the early 20th century. Waterloo instituted co-op from its inception and now has the largest such program in the world. Sandy McLellan explains:

"The co-op model exposes students to work placements in their field several times over the course of their degrees. These experiences better equipped them with relevant skills for when they entered the workforce upon graduation. When I did research for the Ministry of Natural Resources, I often hired students to assist with the research activities. Given these experiences, many of these students went on to successfully continue working with the Ministry and other planning agencies when they graduated."

Professor McLellan was not alone in both having students in the co-op program but also at times being a co-op employer. The students he refers to were also not alone in going on to work in the companies and agencies in which they had worked in co-op placements. Students adopt different strategies to help them take best advantage of co-op. Some consciously choose different types of jobs each work term in order to gain the widest experience. Many students find out from work experience what they don’t want to do which can be as important as finding out what you do want. Other students opt to work for the same employer and many go on to permanent positions in those same companies and departments.

The co-op model exposes students to work placements in their field several times over the course of their degrees. These experiences better equipped them with relevant skills for when they entered the workforce upon graduation. When I did research for the Ministry of Natural Resources, I often hired students to assist with the research activities. Given these experiences, many of these students went on to successfully continue working with the Ministry and other planning agencies when they graduated."
The hiring procedures in the Waterloo co-op system have evolved over the last half century into a very sophisticated marketplace where jobs are listed, students apply, interviews take place, and then offers are made. Both students and employers rank their choices. When employer and student choices agree it is a match made in heaven. When they don’t match a system kicks in that optimizes the benefit for both parties. Co-op placements are either for one or sometimes two terms (four months or eight months).

Co-operative education was part of Waterloo’s approach to education from the beginning. The Engineering Faculty began to experiment with the idea in 1957. Architecture had a full co-op program from its inception in 1967. It was not until almost a decade later, in 1976, that Geography’s co-op program was introduced. Planning and ERS followed each with a co-op stream running parallel to a regular program that could be completed in a shorter period of time. Professor Clarence Woudsma says that:

Planning decided to initiate full co-operative education in 2010. The move was in response to key drivers including the profession of Planning arguing that a critical component of education is for student planners to have practical experience before completing their degrees. Students also expressed that they found these experiences to be very valuable.

There were some unforeseen consequences with the introduction of co-op. Many academics were quite comfortable in the time-honoured, three term cycle, where the bulk of teaching happened in the Fall and Winter terms with Summer “off.” Off from teaching at least. Professor Geoff McBoyle says that once you are committed to running co-op it means teaching a full program each term. “Co-op,” McBoyle goes on, “meant faculty had to change their way of life. They sometimes had to teach in the summer.”

What is difficult for many people unfamiliar with co-op to grasp is that the jobs involved are “real.” By that I mean that students are paid competitive wages and they are given substantive tasks. The salaries
offered need to be high enough to entice the best students and sufficient to allow students to finance a good portion of their tuition and living expenses. Many firms and agencies budget a year or more in advance for blocks of work that they will assign to their Waterloo students. Given the high academic quality of students in Waterloo’s co-op programs, sight unseen, employers are confident that the work will be done and done well.

Linda Mortsch graduated from Geography in the 1970s and completed a master’s degree, also at Waterloo in the 1990s. She has enjoyed a successful professional career which began when she was part of the very first co-op cohort. Her story is typical. She says:

“My co-op experiences demonstrated why resource management courses were so important. I worked for the Ontario Ministry for Environment, where the first ground-breaking reports on acid rain were being written. I also had a co-op position in the tar sands for Syncrude Canada Limited, where I learned a lot about climatology These co-op experiences launched my career with Environment Canada. The co-op really cemented my academic learning with real-life experiences

Professor McBoyle sums it up. “Co-op put UWaterloo on the map in the country. Before co-op people would say they graduated from a place in Waterloo County. After co-op got established people said they graduated from The University of Waterloo.”

**Internship**

There was nothing particularly new about the idea of learning on the job. The apprenticeship principle is ancient. Co-operative education may have evolved across many nations and spectacularly so at Waterloo, but the older forms of experiential learning did not disappear. Before joining co-op, Mac McMartin in Geography and Hugh Lemon in Planning were staff members dedicated to finding internship positions for students.

However, there are certain characteristics often associated with internships that potentially make them a less effective learning mode than other alternatives. Internships are usually one-off arrangements, often unpaid, of varying lengths and unregulated. By contrast co-op programs are structured within formal university-employer agreements, they are paid, they occur within the pulse of the academic year and they are governed by the Canadian Association for Co-operative Education (CAFCE). Nevertheless, in many cases, as we will see presently, internships are and have been worthwhile and are the only alternative for many students.

This is the case at the Master’s level, e.g., Master’s of Economic Development and Innovation (MEDI), Master’s of Climate Change (MCC), Master’s of Development Practice (MDP). Internship is a requirement of the thesis-based program in the School of Planning; and even integrated into undergraduate programs that are not co-op, e.g., KI works for Knowledge Integration students, a field placement for international development students, and the recently launched Global Citizen Internship program. Current Director of SEED, Bruce Frayne, comments on this for the undergraduate INDEV program “International Development has an eight-month, two-term field placement component
Many courses involve segments where classroom learning is coupled with hands-on experience.

for students. The field placement is a key feature of the program”. In the recent program review, the external consultants’ report stated that the field placement was the “jewel in the crown” of the program. Professor Frayne goes on to say that “our students come back much more self-assured and mature. Some students do so well they end up working with the organization after graduation”. And so the story of experiential education at Waterloo continues to evolve.

Project/Studio Courses

Stephen Murphy, Head of SERS, says that experiential learning in the classroom is very important. However, he continues:

… it requires smaller classes where students are building qualitative and quantitative skillsets and are closely tied to what students will do when they enter the workforce. For example, in ecology we have a course in electrofishing and get students certified. Students often do actual restoration reports which include collecting data and writing consultancy reports. Students learn about effective communication in important arenas such as how to do policy briefings for government agencies. We’ve also had outdoor/field courses abroad to places like Rome and Jamaica on a variety of topics such as food security and coastal marine communities.

Student memories emphasize the same practical focus. Tony McQuail said:

My recollection of the Man-Environment department at the time was that it was very much about using your head, exploring, and discussing ideas and issues. The professors provided some leadership, direction and resources but they weren’t trying to cram your head with information. Instead, we were doing independent projects and figuring stuff out on our own.

“Experiential learning was a key part of the Man-Environment department,” remembers former student Kevin O’Reily. “The professors had a lot of community connections with NGOs and other bodies that they brought into the classroom.” He says that he and his classmates
had a very different university experience than other faculties such as Engineering. “In my experience,” he continued, “I often found that my worldview was expanding in comparison to my engineering friends, particularly in the ability to see different perspectives and to be open to different ideas.”

Man-Environment had project courses where students could do things like undertaking research projects, working for an NGO, or a community centre. These courses gave students a lot of leeway in terms of what they could do and got them engaged in the local community. Kevin O’Reily thinks that was a unique approach within university courses at the time.

The first project I did was examining a court case in the Northwest Territories on mineral exploration and the impact on Caribou. I also did a group project where we were invited to make a submission to the federal government planning process for a place called Lancaster Sound.

They developed a number of scenarios for different types of interests in the area and went to Ottawa to present these scenarios in front of a panel. These projects provided really important experiences. They were part community experience but were also important for how you could develop yourself as an individual and equip yourself with a set of skills that you don’t always get as an undergraduate. O’Reily says, “these types of courses really focused on getting students out into the real world.”

The KI Museum project is a sequence of four courses that includes a field trip to a museum-rich city in Europe to immerse students in museums and culture, spend seven months combining what they found with what they’ve learned in museum-focused design courses, and then culminating in an exhibit.

Professor Bruce Frayne explains the School of Environment, Enterprise and Development approach to experiential learning. “In my classes I use a lot of transformative scenario planning, which involves dealing with complex problems that don’t always have concrete answers but where action is needed.” He says that it can be frustrating for students because there is no predetermined outcome, no one right answer. Students go through a learning process of trying to understand the different parts of a system to determine what kinds of actions to undertake. Students in the

Students are often required to make presentation of the results of their work. Here the audience is made up of professors but in many cases, the presentations are given to city councils or research project clients. This is where students honed their public communication skills.
In 2014 students from Environment travelled to Nepal as part of a 22-day course field trip to the Kathmandu and Everest regions. The trip, part of GEOG 430C, is offered most years and looks at interdisciplinary perspectives to human-nature interactions in high Alpine environments.

Photo credit: Andrew Wong
Environment and Business program do an eight-month capstone project in their final year where they work like consultants for industry partners. “This has an educational component,” Bruce Frayne explains, “but it’s also a service that we provide free of charge to these clients and it connects students to industry partners.”

Professor Peter Deadman, Director of GEM comments that, “we have a long history of experiential learning in Geography. This is often done through field trips on campus, locally and internationally to actually do the things we talk about in class.” Deadman says that a lot of GEM’s courses are hands on and have an experiential component such as lab work.

Bruce Mitchell remembers collaboration as far back as the 1980s between Geography and Planning in creating an annual graduate student field course visiting places like Atlantic Canada. It was great to have students from both programs interacting, continuously creating a richer Faculty and it was also the pattern for a lot of graduate courses. Professor Mitchell says:

For us it was both fun and challenging to encourage students to be critical and to challenge authority. I remember having all kinds of conversations with the students about places we were visiting and I learned a lot from them as well.

Geography and Aviation may be the purest example of the idea of having hands-on training integrated into a study program. Conceived by Professor Ian McKenzie and supported by former astronaut, Commander Chris Hadfield, the course of study leads to the acquisition of a Bachelor of Environmental Studies (BES) and a pilot’s licence.

Dr. Clarence Woudsma, Head of Planning, says that:

Across degree programs, undergrad and grad, there are studio/practice-based courses where students form diverse and interdisciplinary teams that work with community partners and with particular clients to help solve their problems and present their solutions. This allows students to take what they learn in the institutional context and apply it to a real-world problem. That is the hallmark of the Planning program. Each degree level has experiential courses like this.
In my own case, most of the courses I taught over 20 years offered plenty of opportunities for experiential learning outside the classroom. A good example is the course on public participation. After a review of relevant theory and some exposure to different approaches we sent the students out with clipboards to question people on the street. We sent them door-to-door in neighbourhoods. We sent them out to organize meetings in church basements and community recreation centres, then we snuck in posing as ordinary citizens and debriefed the students afterwards about improving their consultation techniques. In these ways they learned to sample, randomize and most of all, how to deal professionally with diverse people. When they were finished we sent them to make presentations of their findings to town councils. For such presentation the students created their own sparkling graphics, something they were generally better at than their elders.

Grad Theses and Senior Honours Essays

It is hardly surprising to find that in the Environment Faculty the majority of Senior Honours Essays and Masters Theses in all units addressed practical issues. This was somewhat less true for Doctoral Dissertations. The relationship between faculty members and doctoral students is characterized by its long duration and more theoretical nature. Dr. Kai Gu who received his PhD in 2003 and now teachers in New Zealand, reflected on his experience:

The Faculty also had a number of great thinkers and researchers. I had the opportunity to work with professors like Pierre Filion, Robert Shipley, Bruce Mitchell, and Geoff Wall. They were so open to academic discussion and always open to working with international students like me. My discussions and interactions with them were important for the development of my thinking and research. What was most memorable was spending Friday afternoons at the Grad House along with fellow graduate students and professors to discuss research and debate ideas over pints of beer!

Not withstanding, at the undergrad and master’s level students were directed toward experiential learning as they explored their topics. A measure of the result of this orientation has been the number of theses that have resulted in peer reviewed publications. In my case, roughly a third of all the theses I supervised yielded published papers and I’m sure many of my prolific colleagues have better records than that.
ERS graduate Kevin O’Reily says, “I remember professors like Bob Gibson, Sally Lerner, and Greg Michalenko being very encouraging and supportive of working on environmental issues and exploring these issues.” He thinks that because environment is a very broad yet interconnected topic, it was very easy to focus on an area of interest and connect it back to what was being learned in classes. Having studied at other universities, he found Man-Environment to be more flexible, thought-provoking, and challenging in a very positive way.

Even grad students who chose the course-work Masters degree appreciated the chance for experiential learning. Susan Cartwright who came to Environment in 1981 says:

… what appealed to me about geography was the issue of resource management and conflicts that arise between users and conservers of various resources. I was interested in studying how to resolve conflicts between two legitimate users of a resource and other interested parties involved.

Contracts

Perhaps the ultimate experiential learning situation is when a student, either before or after their graduation, launches their career with their first contract position. These opportunities come about when faculty members have funding for research which can be applied to salaries for research assistants. Sometimes the funding is directly related to hiring students in order for them to gain the work experience. The MITACS Accelerate Program has given such opportunities to dozens of ENV students over the last 10 years but there are many other sources of funding as well.

Kevin O’Reily recalls that:

I was part of a group of students that was working with Gordon Nelson and John Theberge who were doing research in the Yukon on park planning. I remember a group of us driving to the Yukon. That was quite an experience for me since I had mostly grown up in Southern Ontario. It was a road trip that took eight or ten days and it was my first time seeing the Rocky Mountains.
and travelling across the country. This experience had a great impact on me and my love for the North.

Kevin went on to say that over the course of his undergraduate and master’s degrees he went to the Yukon three times to evaluate the potential for protected areas and permits for short-term activities in the region. His research showed the need for regional land use planning in the Yukon.

These are all good examples, but I must interject that not all experiential learning has been enjoyable and risk free. Professor John Theberge has been mentioned more than once in this narrative, in the paragraphs above for example. He remains a legend in the Faculty. The story goes that once when a group of his grad students were living in the wilds of Algonquin Park tracking the wolves that John’s research had demonstrated were a distinct species, their camp was raided. It was said that someone didn’t like the research results and wanted to compromise the data being collected.

Clarence Woudsma of the School of Planning, asserts the importance of experiential learning in ENV. “However,” he says, “it is important that students have both positive and negative experiences. The challenge we face as an institution is giving students the room to fail. Many times we set things up too well and are too focused on the positive experience.” He goes on to say that there is value in learning from failure as well. “The notion of failure is different now than it was 20 or 30 years ago. Experiential learning can contribute to the importance of learning from failures.”
Professor Luna Khirfan coaches students through a design exercise in the Faculty’s well lit studio.
Leaders of Tomorrow

In this chapter I have stressed the significance of experiential learning in the Faculty of Environment. This is not say that all the other forms of learning are not important. Class room lectures, testing, essay writing and all the other forms of teaching in the Faculty are of high quality and second to none. Experiential learning, however, is a value added that sets the Faculty apart and produces the leaders of tomorrow.

THERE IS A REASON WHY WATERLOO CONSISTENTLY RANKS HIGHEST IN THE LEADERS CATEGORY IN THE MCLEAN’S POLL.

One of the sure ways for teachers to take the measure of what they are trying to impart and how well it is being received is to listen to what former students are saying. Although it was close to 30 years ago when Dr. Isaac Mwangi was an FES student it is, I believe, instructive to reflect on how he described his experience as a doctoral candidate in the early 1990s:

Dr. Mulamoottil and other Environment professors had a lot of community projects in Kitchener/Waterloo. They used that research and the findings to teach students. This was important because we were being taught using real-world examples. Similarly there were key speakers invited to give talks about practical experiences. The impact of the ENV and KW university-community link was an important learning experience for me because of the work I have done with communities in Nairobi since I graduated. It gave me a sense of how to practice Planning in communities. It also helped me in my work with the UN. I worked with governments in Africa and in communities in many African countries. In that sense Waterloo didn’t only make me an academic but gave me a method for working with communities out there.

Another way a person can really get a feel for the significance of the Faculty of Environment would be to attend the annual University of Waterloo Planning Alumni Dinner at the Royal York Hotel in Toronto in November. Organized for the last 29 years by ENV graduates it is what I call a meal with about 1,000 of my closest friends. One thousand is the seating limit of the room and there is always a waiting list. The proceeds go to support a Planner in Residence who brings practical knowledge to share with students. The dinner has become the “planning event of the year” in the province of Ontario. That is what I contend can be called leadership.
Chapter 5
Our Place in the World
WHO DO YOU CALL?

Marko Dumancic, Manager of Mapping, Analysis and Design, was sitting in his office in the basement of EV2. It was the late 1980s. The phone rang. It was the Vatican in Rome. Marko says:

I still remember the day. They called to get advice on how to make conversions so a GIS program would run on an IBM mainframe. We had figured out how to do this and our work was quite progressive and cutting-edge at the time. That was a very memorable and hilarious moment for me!

Hilarious maybe but also pretty profound. When I think about the place that the Waterloo Faculty of Environment has made for itself in the world, that story is hard to beat.

Environmental Studies may have begun life as a modest experiment in pedagogy and knowledge generation but over five decades it has expanded into a significant and recognized contributor to the enterprise of understanding the world we all share. In this chapter, we will look at some of the ways the Faculty has reached out to the international community through publications, individual research work and large projects that involved many students and faculty members. We will also consider where some of our graduates have landed in their careers, we will see what stars have been attracted to join us and finally we will look at one of the important current roles the Faculty is now playing.
Publications

I discussed in an earlier chapter the fact that EV was not a major producer of peer reviewed research papers in its early days. That began to change with the appearance in about 1974 of Environments: A journal of interdisciplinary studies. Originally, under the direction of Professor Harry Coblentz and later Professor Gordon Nelson, it set out to present, “high-quality, multi- and trans-disciplinary, and cross-sectoral research that effectively addresses major understanding, planning, management and decision-making challenges related to the environment.” This journal joined the occasional papers that were being published by the individual FES units and provided a more high profile outlet for research being done in EV. It also welcomed submissions from everywhere in Canada and beyond. In the early 2000s, with the retirement of Professor Nelson, Environments moved to Wilfrid Laurier where its new editor, Professor Scott Slocombe, is a member of the Geography Department. Many young EV scholars got their publishing start in Environments. Other EV faculty members have held and continue to hold editorial positions on a wide range of international scholarly journals.

Alternatives Journal or A/J is a different kettle of fish. It is a colourful, well produced magazine intended for a wide audience. It styles itself, “Canada’s national environmental magazine, and independently publishing intelligent & informed environmental journalism since 1971.” Alternatives Inc., is a registered Canadian charity. The long-time editor is Marcia Ruby and the chair of the editorial board is Bob Gibson, Professor in SERS. For many years A/J was housed in the Environment Faculty, some of that time next-door to the student coffee shop, and its lively presence had a leavening influence. Many students worked on the magazine in various capacities including writing articles. Faculty members also served on the board and contributed copy and edited special themed issues. Alternative’s offices are now located in downtown Kitchener.
The International Involvements of Individuals

From its beginning FES has been involved in the wider world. Professor Peter Deadman comments that, “Geography has always had an international focus.” At first, these followed the interests of individual faculty members although sometimes they involved graduate students and collaborative work. For example, Professor Jim Bater worked in the Soviet Union, Dr. Ron Bullock was involved in Kenya, Professor Jim Gardner travelled to the Karakorams, Professor Aubrey Diem wrote about Europe, Professor B. Hyma studied in India and Dr. Bruce Mitchell in Australia. The School of Architecture initiated the important Rome program which was discussed elsewhere and Architecture Director Rick Haldenby conducted archaeological research work in Tunisia.

Other EV faculty brought international experience with them, some of which had been consulting work as distinct from scholarly studies. George Francis had worked in Latin America and for the UN in New York. Len Gertler in particular had experience from his time with the large engineering firm Acres. His work in Indonesia, as we shall see, was to become a key factor in the internationalization of the Environment Faculty.

Major International Team Projects

“Involvement of the Faculty in large collaborative projects was Gertler’s dream,” remembers Distinguished Emeritus Professor Geoff Wall. Following several unsuccessful attempts, including one in the Caribbean, Professor Gertler was eventually successful in involving the Faculty in a Canadian International Development Agency (CIDA) funded University Consortium on the Environment. The project was based in Indonesia and involved a number of other Canadian and Indonesian Universities. Dr. Gertler knew Indonesia well having had a significant role in drafting their land use planning regulations. Professor Bruce Mitchell recalls that, “in the spring of 1987 Gertler assembled a small team of people from Geography and Planning to go to Gadjah Mada University in Yogjakarta, Indonesia.” Thus began a remarkable series of international projects a few of which are enumerated in the table that follows.

Officially running from 1989 to 1994, the goal of the first Indonesia projects was to prepare a sustainable development strategy for the island of Bali. This $1.2M project involved professors and graduate students from across the Faculty in teaching, research and planning. It paved the way for at least three separately funded short-term agreements to provide training programs for Indonesian university teachers and government officials. The Bali Sustainable Development Project (BSDP) was not only important in its own right as an example of a timely response to the World Commission on Environment and Development 1987 document Our Common Future (The Brundtland Report), it provided novel international opportunities for scores of Waterloo people. Geoff Wall says:

“it brought attention to the Faculty as an international player, both externally as well as within the university.”

What I remember from the early 1990s were the international dinner nights in the Minota Hagey residence when students from different countries prepared their traditional specialties.
## Selected UWaterloo Faculty of Environment International Involvements

<table>
<thead>
<tr>
<th>DATES</th>
<th>LOCATION/COUNTRY</th>
<th>LEAD</th>
<th>FUNDING</th>
<th>DETAILS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980s</td>
<td>Soviet Union</td>
<td>Bater</td>
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<td>&gt; individual projects</td>
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<tr>
<td>1980s</td>
<td>Karakorum, Mongolia</td>
<td>Gardner</td>
<td></td>
<td>&gt; individual projects</td>
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<tr>
<td>1980s</td>
<td>Australia</td>
<td>Mitchell</td>
<td></td>
<td>&gt; individual projects</td>
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<tr>
<td>1980s</td>
<td>Nigeria</td>
<td>Bullock</td>
<td></td>
<td>&gt; individual projects</td>
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<tr>
<td>1980s</td>
<td>India</td>
<td>Hyma</td>
<td></td>
<td>&gt; individual projects</td>
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<tr>
<td>1980s</td>
<td>Europe</td>
<td>Diem</td>
<td></td>
<td>&gt; individual projects</td>
</tr>
<tr>
<td>1989–1994</td>
<td>Bali, Indonesia</td>
<td>Gertler</td>
<td>$1.2M, CIDA</td>
<td>&gt; in conjunction with other universities</td>
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<td></td>
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<td></td>
<td></td>
<td>&gt; sustainable development strategy</td>
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<td></td>
<td></td>
<td>&gt; led to three short term training agreements</td>
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<td></td>
<td></td>
<td></td>
<td>&gt; involved many faculty and students</td>
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<tr>
<td>1993–1996</td>
<td>Costa Rica, Chile, Cayman Islands</td>
<td>Hall</td>
<td>$527,700, IDRC</td>
<td>&gt; Integration of PC-based census processing software (UN’s Redatam tool)</td>
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<td>&gt; GIS-based decision support in health care access, education access,</td>
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<td></td>
<td></td>
<td>&gt; and land development for tourism</td>
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<td></td>
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<td></td>
<td></td>
<td>&gt; Involved two PhD and one Masters student</td>
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<tr>
<td>1998–1999</td>
<td>Argentina</td>
<td>Hall</td>
<td>$22K, RadarSAT</td>
<td>&gt; Use of Radarsat imagery to identify pockets of urban poverty in the</td>
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<td></td>
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<td>&gt; City of Rosario</td>
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<tr>
<td>1996–2001</td>
<td>Sulawesi, Indonesia</td>
<td>Mitchell</td>
<td>$5M, CIDA</td>
<td>&gt; Consortium focused on watershed planning</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>&gt; Provided grad research opportunities</td>
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<tr>
<td>1997–2001</td>
<td>Fiji</td>
<td>LeDrew</td>
<td>$58K, National Geographic Society</td>
<td>&gt; Remote sensing of coral reef bleaching</td>
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<tr>
<td>2001</td>
<td>Peru</td>
<td>Hall</td>
<td>$100K US, Ford Foundation</td>
<td>&gt; Strengthening government and social sector participants in health and education planning in the District of Independencia, Lima</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>&gt; Involved three Masters level students</td>
</tr>
<tr>
<td>1999–2001</td>
<td>Pakistan</td>
<td>Newkirk, Wall, Nelson, Wood</td>
<td>CIDA</td>
<td>&gt; Planning and establishment of an environmental studies program in an engineering university in Pakistan</td>
</tr>
<tr>
<td>2000–2005</td>
<td>Ukraine</td>
<td>Lazarovich</td>
<td>National Geographic Society</td>
<td>&gt; Various faculty members travelled to Ukraine conducting workshops on building civil society</td>
</tr>
<tr>
<td>2001–2006</td>
<td>Pakistan</td>
<td>Shipley</td>
<td>National Geographic Society</td>
<td>&gt; Studying floods in National Parks</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>&gt; Involved three Masters level students</td>
</tr>
<tr>
<td>2014–ongoing</td>
<td>China, India, Jamaica, Kenya, Mexico, Mozambique and South Africa</td>
<td>Frayne</td>
<td>$2.5M, SSHRC-IDRC</td>
<td>&gt; Food security in rapidly urbanizing regions</td>
</tr>
<tr>
<td>2015–ongoing</td>
<td>Multiple Commonwealth Countries</td>
<td>Elliott</td>
<td>$449K</td>
<td>&gt; Queen Elizabeth Scholarships</td>
</tr>
</tbody>
</table>
“There was some criticism at UWaterloo”, remembers Bruce Mitchell, “about working in Indonesia because it was a dictatorship and some thought our work was giving creditability to the government.” The counter argument was that this was an opportunity for things to change, to bring in new ideas, and develop a student exchange program. It was important to give the Indonesian students the chance to visit Canada and see another way of governing. Mitchell says, “we were also doing work there when the dictatorship was overthrown, so there were certainly some turbulent times.” The Environment Faculty was in Bali for over 10 years and the project had a tremendous impact for research and teaching both in Indonesia and Waterloo.

From 1996 to 2001, after moving on from the Bali project, the Faculty became a key player in a new $5.1M Consortium on the Environment, Collaborative Environmental Project in Sulawesi, another Indonesian island. The focus here was on a particular watershed management scheme; once again it was under the leadership of Bruce Mitchell.

Also, from 1999 to 2001, with CIDA support, the Faculty was engaged in the Pakistan Environmental Project, with a focus upon resources management, under the co-direction of Ross Newkirk, Gordon Nelson and David Wood. This program was not continued and the Faculty’s attention turned to China.

Food security researcher Steffanie Scott visits with farmers in Lan Kau district in Henan province, China, 2011. Researchers in the Faculty of Environment travel the world to gain perspective, and information on environmental issues facing everyone on the planet. Photo credit: Dr. Scott’s host family.
With respect to China, Professor Ying Wang, Director of the School of Geo and Ocean Sciences, Nanjing University, for both personal and professional reasons, approached the Faculty on a number of occasions to explore collaborative opportunities. Reciprocal visits took place but ceased for a period following the Tiananmen Square tragedy in 1989. Eventually, a group of faculty from UWaterloo, WLU and Guelph visited the southern island province of Hainan to explore opportunities with the Hainan Provincial Government and Nanjing University, raising expectations in China, but failing to take follow-up initiatives to create a tangible project.

“I was invited to pick up the pieces,” says Geoff Wall. “Drawing substantially on the Bali Sustainable Development Project experience and, to a lesser extent, the Sulawesi program, we wrote a proposal for collaborative work worth about $1.2M in Hainan.” The work focused on Environmental Training for Integrated Monitoring and Management in the Coastal Zone with the objective of strengthening the capability of the provincial government to deal with the growing pressures on the coast of Hainan, especially from tourism. Professor Wall is one of the leading international scholars in the field of tourism studies.

Recognizing that if momentum was to be maintained once the Hainan project had run its course, the acquisition of additional resources would need to be pursued. Accordingly, with additional partners in both Canada and China, notably Dalian University of Technology, but with an array of broadly similar activities, approximately $4M was obtained from CIDA, University Partnerships in Co-operation and Development Program, to commence a five-year project in 2001 entitled Eco-Planning and Environmental Management in Coastal Communities in China, Ecoplan China for short.

From 1997 to 2003 another CIDA funded operation called the Canada China Higher Education Program supported a wide variety of teaching and research activities were undertaken but at the core was the training of 50 government officials at a graduate level that met the requirements, all but a thesis, of a Master’s degree at Nanjing University. Computers, GIS and remote sensing software, and ground penetrating radar were provided, along with training, to enhance capabilities to monitor coastal changes. There is enough on-going work of various kinds with different partners in China that the Dean’s Office employs a co-ordinator, Fulu Mao, who deals largely with matters affecting the Chinese connections.

Professor Mike Lazarovich worked for several years in Ukraine where his language capacity enabled him to conduct workshops on establishing civil society after socialism.
Many of the initiatives described above were undertaken at a time when “internationalization” was about to become a goal of the University of Waterloo, as well as at other universities throughout the world. The projects have funded a great deal of training and research by both faculty and graduate students, and have drawn attention to the ability of the Faculty to operate in the international arena.

Where Have Our Graduates Gone and Where Have Our People Come From

As of November 2018, almost 15,000 people have graduated from the Faculty of Environment in the last 50 years. They now live in 87 different countries. The top six nations that our grads call home are highlighted on the map that follows.

With respect to faculty members, 40 per cent are either originally from another country or completed their PhDs abroad. Places of origin include China, Columbia, various European countries, Pakistan, South Africa, Russia, the UK and the USA.
THE TOP SIX NATIONS THAT OUR GRADUATES CALL HOME

United Kingdom 53 / 0.36%

China 249 / 1.67%

Australia 50 / 0.34%
Climate researchers Chris Fletcher of Geography and Environmental Management using a deck of cards to explain extreme weather to CTV Kitchener News. Communicating research to the public has become an increasingly urgent part of the work being done in the Faculty of Environment. Photo credit: Sam Toman
Conclusion

The Sustainable Development Solutions Network (SDSN) Canada, launched in May 2018, has grown from the United Nations Sustainable Development Goals (SDGs) and the Paris Climate Agreement. It is “part of a global SDSN movement to build a network of universities, colleges, research centers, and knowledge institutions to promote practical solutions for sustainable development.” There are over 800 participating institutions worldwide with members working together to support applied research to deal with the most pressing global problems. Not surprisingly, Waterloo’s Faculty of Environment has a leading part in the SDSN with Professors Bruce Frayne, Simron Singh, and Neil Craik taking on specific roles with Jon Beale as the manager.

So who gets called when people want answers to environmental questions? The day I was writing this particular section, I was in Europe. I was listening to CBC Radio on my computer. It was Professor Blair Feltmate, Head of the Intact Centre on Climate Adaptation, University of Waterloo Faculty of Environment. That is one example but you can be confident that at any time of the day and in places all over the world, phones belonging to Faculty of Environment grads and current members are ringing. The world is a better place because very often they have the answers.
Chapter 6
The Future
When I came to the point where the story of the Waterloo Faculty of Environment turns from reflecting on the past to divining the future, I felt that the most appropriate voice to hear first was that of the current Dean, Professor Jean Andrey. She began her comments saying how struck she was by the quotation from the report of the Ad Hoc Committee on Environmental Studies, dated November 1968:

It is the contention of this brief that the University of Waterloo has, at this point in time and with its presently available resources, a unique opportunity to structure the academic framework for the emerging evolution of integrated environmental studies.

Dean Andrey says, “it speaks both to the emergence of environmental studies as a new field of education and scholarship, and also the associated opportunity for University of Waterloo to play a leadership role in its evolution.” As outlined in Chapter One the environmental education movement had its origins in the 1960s and was linked to both local and international concerns about environmental degradation associated with a range of new products and technologies combined with old practices and policies as well as rapid population growth. The Dean reiterated that the thrust of the movement is illustrated by the writings of Rachel Carson, Paul Ehrlich, and Jane Jacobs, to mention a few. The formation of the Club of Rome in 1968 and the launching of UNESCO’s Man and the Biosphere Programme in 1971, were also part of this movement. That the recently founded University of Waterloo – an unconventional, externally facing institution – took up the challenge of environmental education and inquiry in ways that departed from traditions should not be surprising. “And so,” Professor Andrey continues, “one might ask how we’ve done in achieving the seven aspirations laid out for the new College of Environmental Studies in 1968?”
The Focus for a Body of Knowledge

The first aspiration was that “The new College/Faculty should be the focus for a body of knowledge and understanding of the human environment.” Here, Professor Andrey’s first thoughts go to the two professional schools that deal with designing and creating communities that were part of the founding – the School of Architecture and the School of Planning. As noted earlier, Architecture is now administratively part of the School of Engineering. The separation of these Schools is at odds with the structure of some other prestigious institutions, such as University of Pennsylvania and MIT. She says this has arguably narrowed the Faculty’s coverage of the designed human environments. At the same time, however, the Faculty has embraced scholarship on the Anthropocene and the myriad influences of human activity on our planetary home. This has resulted in both depth and breadth on the study of environmental governance and management. Professor Paul Parker, Associate Dean of Strategic Initiatives, a leader in both economic development and green entrepreneurship, gives a great example of the wide-spread acknowledgement of Environment’s status:

The Faculty’s role in the Sustainable Development Solutions Network (SDSN) is the next step in dealing with the global challenge for climate change. The unique piece our Faculty brings to the SDSN is entrepreneurial creativity and turning these challenges into solutions.

The Faculty of Environment is, therefore, the focus for environmental knowledge at the University of Waterloo.

Professional Education

The second aspiration was that, “in this setting, professionals will be trained in an educational atmosphere where they can develop a degree of mutual understanding, which will foster a team approach to problems in their professional life.” On this matter, Dean Andrey is enormously proud of how the Faculty has been able to create a coherent (and cohesive) whole out of a professoriate with degrees in more than 60 unique disciplines and a student body whose programs blend together, in myriad ways, the scholarship of environmental science, social science, business, and spatial technologies. Professor Richard Kelly expresses it this way, “as a Faculty we are concerned with training students who are critical thinkers and confident in their abilities. It’s about getting students excited about what they are learning and for them to gain key skills and capabilities that equip them for careers after academia.”

Vigorous Contact with the Mainstream of Academic Life

The third aspiration is that, “the environmental professions should develop in vigorous contact with the mainstream of academic life.” This statement, Professor Andrey believes, was based on the realities that environmental education was new in 1969 and examples of inter- and trans-disciplinarity that worked across the natural and social science divide were few and far between. Today, we see environment integrated into every Faculty at University of Waterloo, as illustrated by recent reports on environmental sustainability, uwaterloo.ca/sustainability/about/reporting. Environmental scholarship has blossomed everywhere,
creating new fields, such as sustainability transitions or ecological economics. “It is rewarding,” says the Dean, “to think that our own Faculty of Environment was one of the forces that moved the dial on this front.”

We can listen to the advice of distinguished graduates such as Susan Cartwright on this issue. She tells us that, “the increasing cross-fertilization and collaboration among disciplines and Faculties is important because that mirrors what students will find in the fields of work they enter. Being able to interact with people from various disciplines is very important.”

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**A Student of Humans and their Environment Per Se**

With respect to aspiration four, Professor Andrey believes that the statement clearly gave rise to the Man-Environment program, which then became the Department of Environment and Resource Studies and is now the School of Environment, Resources and Sustainability. However, she is confident in saying that the entire Faculty and all of its programs are based on the integration of ‘human systems’ and ‘natural systems,’ so she believes that we have over-delivered on the promise. An illustration of the wide-ranging backgrounds that are brought to bear in the Faculty is the degrees earned by professoriate, as illustrated in the pie chart and Appendix. For example, we have integrated Indigenous ways of knowing to only a limited extent, so we need to continue to grow in our understanding of humans and their environment. Virtually all ENV graduates are students of humans and their environment. Alumnus Tony McQuail underlines why the emergence of this kind of student is important when he says, “the one change I see in society is an understanding that the environment isn’t out there, and it’s a part of every aspect of our lives.”
Decision-Makers in Industry and Government

With respect to aspiration five, there are many examples of how graduates from our programs have been and continue to provide leadership in industry, government and the non-profit sector. Professor Andrey asserts that, “our illustrative list of 50 alumni is proof of that.”

The leadership shown by Waterloo ENV graduates is particularly evident in the field of entrepreneurship. Professor Paul Parker says that, “since the inception of the Environment and Business program, more than 450 Environment grads have gone on to start successful ventures.”

Other faculty leaders agree. Professor Clarence Woudsma says that, “part of what has made us successful over the last 50 years is that we’ve always had a very strong connection to the external environment.”

Council for Graduate Studies

Regarding the last two aspirations, six and seven, Dean Andrey says, “I see them together. We have not created a College/Faculty-wide Council for Graduate Studies focused on the interdisciplinary enrichment of traditional disciplinary graduate programs.” Instead, she says, “in many ways we have done better than that.” As an example she points to the key role the Faculty plays in the Collaborative Water Program, which is a university-wide initiative that provides interdisciplinary enrichment to water scholars from 22 Master’s and PhD programs on campus. Similarly, ENV has developed theme/problem-focused degree programs that are themselves interdisciplinary. The degrees in Sustainability Management, Development Practice, and Climate Change are good examples. All of this is not to mention the highly collaborative nature of virtually all the Environment Faculty graduate programs. Professor Neil Craik says, “the fact that graduate thesis committees are made up of diverse faculty from across the different departments is a reflection of the fact that we are not limited by research boundaries.”

“PART OF WHAT HAS MADE US SUCCESSFUL OVER THE LAST 50 YEARS IS THAT WE’VE ALWAYS HAD A VERY STRONG CONNECTION TO THE EXTERNAL ENVIRONMENT.”

- Professor Clarence Woudsma
How Have We Done?

I should think it is clear from the discussion above that the Waterloo Faculty of Environment at age 50, can claim to have achieved and surpassed the vision of the founders. The current Dean, Jean Andrey, and all her colleagues can be duly proud of their inheritance. Anniversaries, however, can be as much about looking ahead as looking back. In that regard, perhaps the pertinent question is whether the founding aspirations are as good measures for the future as they have been for the past.

When our 30 plus interviewees were asked, “how do you envision the next 50 years of the Faculty’s growth?,” the answers were as varied as the people. Professor Paul Parker says that, “given the kind of research and teaching we do, I think that we will continue to strengthen our impact across the country and globally.” Ed Jernigan expresses the following idea:

Departments are artificial constructs. In future, I think the Faculty needs to get rid of academic solos and design teaching around the important societal problems faculty members are trying to address instead of around traditional departments. Rather than having students identify with a department they would identify with the problem(s) they are interested in working on.

Such comments, while looking to the future, seem to be reaffirmations of the first 1969 aspiration that the Faculty should be a focus of integrative environmental knowledge.

When asked about the future Steve Murphy says that, “for teaching, the biggest tension will be how we maintain experiential learning in the face of market forces and growing classes sizes.”

Professor Christine Dow says:

I envision the Faculty having more international recognition so that people know that this is a place where we can solve problems and have innovative solutions that we can actually apply. That includes tackling issues from multiple dimensions – the natural science and social science perspectives that can feed into policy and engagement with government. One of the challenges will be to continue fostering that collaborative environment that currently exists and to continue working across departmental boundaries.

Mark Seasons echoes such thoughts when he says:

“we need to make sure that we continue to protect the Faculty’s interdisciplinary/transdisciplinary core.”

The sentiments of these three faculty members once again cast forward while resonating with the original aspiration of championing interdisciplinary, team player education.

When he was asked about the coming 50 years, George Francis spoke of the, “importance of UN type development goals Rio+20, The World We Want, and the UN’s approval for 17 goals and 169 specific targets that draw upon the best in people, planet, prosperity, peace, and partnership.”

The current expression of the Environment Faculty’s third aspiration, vigorous contact with academy, is the Sustainable Development Solutions Network (SDSN).
Speculating on the future, SEED’s Bruce Frayne says:

We need to focus on teaching this and subsequent generations broadly in the field of sustainable development because if we don’t have that, we’ll be in trouble. We need to get people to understand that we are in the long wave destruction of the planet and we need to do something about that.

Ian Rowlands amplifies the notion:

I think our work will increasingly be problem and opportunity centred. I think in ten years we could not have departments with the names they currently have. Instead, the names will reflect opportunities and issue areas (e.g., the School of Water).

Rowlands and Frayne’s view of the future can be seen as the realization of the founders’ aspiration of a “student of the environment per se.”

Rob Gorbet of KI, in speaking about the future thinks, “the university is increasingly focusing on interdisciplinary studies and there is an opportunity for the Faculty of Environment to be a leader in that respect.” The 1969 visionaries who created the Faculty hoped that, “graduates … should take their role in the ranks of decision-makers in industry and government and direct other professionals in the shaping of the environment.” Because the Faculty has been a leader in the field, hundreds of its alumni have realized the founders’ goal. There is no reason to believe that they won’t continue to do so into the future.
“There is nothing more rewarding than fueling the passion and drive of our students to have a positive impact in the world.”

New Themes Emerge

While there may be an inspiring degree of continuity in the Faculty’s work over the past 50 years, it would be myopic to think that everything had been settled in 1969 in terms of significant issues. From the astute observations of our interviewees, a number of new themes emerge. We can consider a few of them and encourage ongoing discussion on these and others. Since the 1960s there has been a complete revolution in the matter of communications. Steve Murphy says, “the bigger issue is how we understand information, evidence, communication and the manipulation of data.” Mary Louise McAllister says that, “I would like to see more emphasis on the impact of information technology and social media – there’s a research gap there.” When it comes to technology, however, Clarence Woudsma cautions that we “make sure we don’t become too focused on technology.”

Interestingly enough, the word “sustainability” did not figure in the 1969 founding document of the Faculty yet it has come to dominate the current discourse on the environment. Simron Singh emphasizes this when he says:

I can see us becoming a very influential force for providing directions for sustainable development in Canada. This includes contributing to climate and sustainability policy and our transition to renewable energies. I think our graduates will play important roles as sustainability managers and will influence how we think about sustainability.
That leaves us with the ongoing dilemma of defining and operationalizing the term “sustainability” and in spite of our much earlier assertions about applied research perhaps in moving into the future there is a need to pause and reflect. On this subject, I will give the second last word to Mary Louise McAllister:

We are quite problem oriented. I would like to see more attention to philosophy and theory. Unless you understand underpinning theoretical perspectives and your own biases and assumptions it becomes more difficult to come up with solutions that adequately deal with complexity.

For the very last word I turn to Sally Lerner:

I think that all of the things we thought were important about learning during the beginning of our Faculty need to be honoured, rather than giving way to what is now an extremely disturbing trend of viewing the university as something you go to in order to make more money when you get out.

I couldn’t agree more that all things from the past should be honoured. However, I think, given the amazing story of the Faculty of Environment and its people, in the end we won’t have to worry about Sally’s last concern.

The Oak tree is a symbol of strength, morale, resistance and knowledge.

It belongs to the Quercus genus tree species – there are up to 800 species all over the world, especially in the Northern hemisphere where they are native. It’s a hearty tree which can live more than 1,000 years. Oak trees support a complex ecosystem with many species, including humans. The oak is one of the most loved trees.

Most oak trees produce a good crop of acorns when they are around 50 years old. Over the next hundred years, the young tree matures into a majestic adult and over its lifespan it can produce as many as 10 million acorns. Some of these acorns will grow into a new generation of oak trees.

The Faculty of Environment is very excited to celebrate 50 years at the University of Waterloo.

WE LOOK TO THE FUTURE.
Appendix

Deans

Peter Nash  
July 1, 1970 to June 30, 1975

Gordon Nelson  
July 1, 1975 to December 31, 1983

James Bater  
January 1, 1984 to June 30, 1992

Jeanne Kay Guelke  
July 1, 1992 to June 30, 1997

Geoffrey McBoyle  
July 1, 1997 to June 30, 2004

Ellsworth LeDrew  
(Interim) July 1, 2004 to December 31, 2005

Deep Saini  
January 1, 2006 to June 30, 2010

Mark Seasons  
(Interim) July 1, 2010 to July 31, 2011

André Roy  
August 1, 2011 to July 31, 2014

Jean Andrey  
(Interim) August 1, 2014 to June 30, 2015 and July 1, 2015 to present

Award of Excellence in Graduate Supervision

Rob de Loë  
Environment & Resource Studies, 2011

Susan Wismer  
Environment & Resource Studies, 2011

Paul Parker  
Geography and Environmental Management, 2013

Jean Andrey  
Geography and Environmental Management, 2013

Jennifer Clapp  
Environment & Resource Studies, 2014

Derek Armitage  
Environment & Resource Studies, 2017

University Research Chair

Dan Scott  
Geography and Environmental Management, 2014

Claude Duguay  
Geography and Environmental Management, 2015

Olaf Weber  
School of Environment, Enterprise and Development, 2018

Thomas Homer-Dixon  
Faculty of Environment, 2019

University Professor

Ellsworth LeDrew  
Geography, 2009

Distinguished Teacher Awards

Jim Gardner  
Geography, 1979

Rick Haldenby  
Architecture, 1981

Ralph Krueger  
Geography, 1985

Geoff McBoyle  
Geography, 1985

Sally Lerner  
Environment & Resource Studies, 1985
Jean Andrey
Geography, 1995

Bruce Mitchell
Geography, 1996

Ian McKenzie
Geography, 1997

Brent Hall
Planning, 2002

Jane Irvine
Geography 2008

Ian Rowlands
Environment & Resource Studies, 2009

Mark Seasons
2011

Jeff Casello
Planning, 2012

Mary Louise McAllister
Environment & Resource Studies, 2015

Katie Plaisance
Knowledge Integration, 2016

Environment Research Excellence Award

Peter Johnson
Geography and Environmental Management, 2016

Leia Minaker
School of Planning, 2017

Associate Deans 2019

Paul Parker
Associate Dean/Strategic Initiatives,
Geography and Environmental Management

Simron Singh
Associate Dean, Graduate Studies,
School of Environment, Enterprise and
Development (SEED)

Brendan Larson
Associate Dean, Undergraduate Studies,
School of Environment, Resources and
Sustainability (SERS)

Amelia Clarke
Associate Dean, Research,
School of Environment, Enterprise and
Development (SEED)

Unit Heads 2019

Bruce Frayne
Director, School of Environment, Enterprise
and Development (SEED)

Robert Gorbet
Chair, Department of Knowledge Integration (KI)

Richard Kelly
Chair, Department of Geography and
Environmental Management

Simon Courtenay
Director, School of Environment, Resources
and Sustainability (SERS)

Clarence Woudsma
Director, School of Planning
# Appendix

## Environment Faculty Members, Degrees Earned by Discipline

<table>
<thead>
<tr>
<th>Discipline</th>
<th>Degrees Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aeronautical Science</td>
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<td>Agricultural and Resource Economics</td>
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<td>Anthropology</td>
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<td>Applied Science</td>
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<td>Archaeology</td>
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<tr>
<td>Architecture</td>
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<td>Arts</td>
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<td>Arts &amp; Business</td>
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<td>Atmospheric Science</td>
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<tr>
<td>Biology</td>
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<tr>
<td>Botany</td>
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<tr>
<td>Business &amp; Commerce</td>
<td>2</td>
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<tr>
<td>Canadian Studies &amp; Native Studies</td>
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<td>Chemical Engineering</td>
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<tr>
<td>Civil Engineering</td>
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<td>Community &amp; Regional Planning</td>
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<td>Earth &amp; Atmospheric Science</td>
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<td>Ecology</td>
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<td>Electrical Engineering</td>
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<td>Engineering &amp; Public Policy</td>
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<td>English</td>
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<td>Environment &amp; Resource Studies</td>
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<tr>
<td>Environment &amp; Sustainability</td>
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<tr>
<td>Environmental Design</td>
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</tr>
<tr>
<td>Environmental Management</td>
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</tr>
<tr>
<td>Environmental Planning</td>
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</tr>
<tr>
<td>Environmental Science</td>
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</tr>
<tr>
<td>Environmental Studies</td>
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<td>Forest Science</td>
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</tr>
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<td>Geodesy &amp; Geomatics</td>
<td>1</td>
</tr>
<tr>
<td>Geodetic Engineering</td>
<td>2</td>
</tr>
<tr>
<td>Geography</td>
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<tr>
<td>Geomatics Engineering</td>
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<tr>
<td>Global Governance</td>
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<tr>
<td>Health Promotion/Studies</td>
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<td>Health Studies/Public Health</td>
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<td>Heritage Management</td>
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<td>Human Ecology</td>
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<td>Interdisciplinary</td>
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<td>International Development</td>
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<td>International Relations</td>
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<td>Journalism</td>
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<td>Land Resources</td>
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<tr>
<td>Landscape Architecture/Planning</td>
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<td>Law</td>
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<td>Metallurgy &amp; Materials</td>
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<td>Science/Engineering</td>
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<td>Natural Resource Management/Planning</td>
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<td>Philosophy</td>
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<td>Physics</td>
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<td>Planning/Urban Studies</td>
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<td>Psychology</td>
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<td>Rural Regional Development Planning</td>
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<tr>
<td>Russian &amp; Eastern European Studies</td>
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<tr>
<td>Science &amp; Society</td>
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