

ARCH 293: Think Like a River: Designing from the Riparian Zone

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"Why is it that despite waters everywhere precipitating, seeping, soaking air, soil and vegetation, collecting in interstices, pores, terraces, cisterns, and aquifers, evaporating, transpiring, and sublimating, we see water somewhere, confined within or behind lines and generally colored blue in maps?"

– Anuradha Mathur and Dilip Da Cunha, *In the Terrain of Water*, 2014¹

"Rivers and streams are the dark matter of landscape...Flowing water tends to be regarded as part of a natural background against which past cultural activity shows up, next to which sites are located, onto which cultural meaning is applied or into which cultural items are placed, rather than having any cultural dimension in its own right. Yet human activity, in the form of modification of rivers, is inextricably bound up with the so-called 'natural' water cycle. As dynamic entanglements of natural and cultural forces, rivers have the potential to re-shape landscape and our understanding of it."

–Matt Edgeworth, *Fluid Pasts: Archaeology of Flow*, 2011²

"I do hereby in His Majesty's name authorize and permit the said Mohawk Nation and such others of the Six Nation Indians as wish to settle in that quarter to take possession of and settle upon the Banks of the River commonly called Ours [Ouse] or Grand River, running into Lake Erie, allotting to them for that purpose six miles deep from each side of the river beginning at Lake Erie and extending in that proportion to the head of the said river, which them and their posterity are to enjoy for ever."

–Frederick Haldimand, October 25, 1784

"The Haldimand Treaty of October 25, 1784, promised a tract consisting of approximately 950,000 acres within their Beaver Hunting Grounds along the Grand River...Less than 5% is all that remains from our original 950,000 acre land grant from our 1784 Haldimand Treaty...The unresolved land rights throughout our Territory impedes the governance of 38 municipalities and 900,000 persons within the Grand River Watershed.

–Six Nations of the Grand River, *Land Rights: A Global Solution*, 2015³

1. OVERVIEW

To design and build is always to negotiate with natural forces, difficult site conditions, and factors beyond our control. Rivers flood, slopes erode, storms churn, materials decay, economies and budgets crash, and people occupy in conflicting and unexpected ways. In the design of landscapes—where sites are not only the *location* but also the *subject* of design—these factors are particularly heightened. In landscape design, some materials are specified and imported from far distances, but many are made up of the site itself (the extant earth, rock, and vegetation). In landscape design, time is a method—designs grow slowly and unfold in response to flooding, wind, sun, and species flows. In landscape design, sites are contested—political and industrial legacies leave physical traces in the soil. Rather than see these forces as obstructions to a perfect plan, how might they generate new ways of seeing and designing? This studio focuses on the relationship between architecture and the more-than-human world, where dynamic social and natural forces are context, subject, and provocation of design techniques.

¹ Anuradha Mathur and Dilip Da Cunha, *Design in the Terrain of Water*, Applied Research and Design, 2014, p. 1

² Matt Edgeworth, *Fluid Pasts: Archaeology of Flow*, Bristol Classical Press, 2011, p. 133

³ Six Nations Lands and Resources Department, *Land Rights: A Global Solution for the Six Nations of the Grand River*, 2018, <http://www.sixnations.ca/SNGlobalSolutionsBookletFinal.pdf>

North American settler culture bears a legacy of binary thinking about humans and their role in the biophysical world.⁴ Nature has been viewed in opposition to human culture, as something to be controlled, exploited, and defended against. These binaries linger in contemporary texts, land-use policies, and architectural thinking, and therefore they manifest in the physical constructions that architects design. In recent years, an emphasis on the social construction of nature has, on the one hand, allowed us to recognize the magnitude of anthropogenic transformation (creating the geological epoch known as the Anthropocene), but also underplayed the profound interdependencies between humans and the rest of the world. In asking you to design with dynamic forces, this studio challenges you to question the binaries of culture and nature and to think about the products of architectural design as more than objects-in-themselves. How can design work be an act of, as Donna Haraway urges, sympoiesis or “making with” other species and forces beyond us?⁵ We approach this challenge with a deep dive into the Grand River and its watershed.

The Grand River in Southern Ontario, which runs right past our school, is a charismatic subject through which to consider designing with myriad, interconnected forces. Rivers are forces manifest. They are the fundamental shapers of terrestrial environments, moving material across the continents, integrating channel, overland, and groundwater drainage. And at the same time because human (and other species) survival is intimately tied to rivers, humans have radically re-organized them: to extract energy, control floods, drain lands, mine resources, and urbanize adjacent parcels. While it is easy to think of rivers as fixed and tangible and fixed blue lines on a map, as Anu Mathur and Dilip Da Cunha remind us, there is no such thing. Rather, rivers are ephemeral, composed of the bedrock, soil, vegetation, and other species, as well as the water that moves through it as precipitation, groundwater, and surface flow. In the era of climate change, newfound attention is being given to re-design river infrastructure, control mechanisms, and management systems, to reconnect urban areas to rivers, even to ascribe human rights to them.⁶

The riparian zone is the interface of river flow and adjacent land. It is an ever-changing margin that encompasses flooding, ponded water, and many different ecological functions. It includes plant and wildlife communities that stabilize banks, manage sediment and nutrient flow, produce microclimates, and generate food webs and stream habitats.⁷ It is also a zone highly developed by people, where river flows are contained, forests cleared for agriculture and lumber, highways and railroads constructed, and urban settlements established. It is neither all wet nor all dry—it is characterized by fluctuation. For this studio, the riparian zone is both a physical site and a conceptual framework for engaging a set of questions and themes:

1. Designing *with* forces. Rather than seeing architecture as something that is placed on top, inserted within, or for looking at nature, how can a more robust engagement with external forces change the way we understand a site, construct and approach a problem, invent and apply design tools, and evaluate a project’s relevance? More broadly - how does architecture interact with all that is more than itself?
2. Examining the Grand River through different land use perspectives and history. How do the ways in which one understands and values a landscape affect the ways that it is managed, developed and designed? The Grand River and its watershed has been viewed, occupied, and transformed by humans in very different ways: as a means of sustenance, energy, resources, profit, mobility, and risk. In this studio we look at three different sites in order to consider how different agendas have shaped the river’s edge, and to propose new ways of interacting with the river. We consider these Grand River sites in relation to the ongoing unresolved Haldimand Treaty with Six Nations.

⁴ See for example, Timothy Morten, *Ecology without Nature: Rethinking Environmental Aesthetics*, Harvard University Press, 2009.

⁵ Donna J. Haraway, “Sympoiesis: Symbiogenesis and the Lively Arts of Staying with the Trouble”, in *Staying with the Trouble: Making Kin in the Chthulucene*, Duke University Press: Durham, 2016, p. 58.

⁶ Debadityo Sinha, “To discover the ‘rights of a river’, first think like a river,” *The Ecologist*, May 22, 2017, <https://theecologist.org/2017/may/22/discover-rights-river-first-think-river>

⁷ *Riparian Areas: Functions and Strategies for Management*, National Academy Press: Washington D.C., 2002, <https://www.nap.edu/read/10327/chapter/3>

3. Site as actant. What is the role of site in design? An agenda of this studio is to consider deeply the role of site in design not as a passive context upon which you place a building, but an active player in design, one that can be shaped through the manipulation of contours and shifting of the ground. The studio is structured to involve a deep study of a particular segment of the river in order to engage this question.

2. ON SITE

The Grand River Watershed is a significant biophysical boundary, draining 6,800 square kilometers of Southern Ontario. From the Dufferin Highlands at 525 meters above sea level, the Grand travels 280 kilometers dropping 350 meters in elevation as it flows into Lake Erie at Port Maitland. Feeding the Grand River are countless tributaries including large rivers including the Conestogo, Nith, Speed, and Eramosa; together these streams and rivers extend 11,000 kilometers in length. This singular watershed encompasses significant biophysical diversity: two forest types (Alleghenian and Carolinian), four climate zones (Dundalk Upland, Huron Slopes, South Slopes, and Lake Erie counties), supporting a rich diversity of aquatic and terrestrial species, including many deemed at risk due to anthropogenic habitat transformation.

Like many rivers, the Grand River is also a highly contested political entity. With the American Independence War, many Haudenosaunee or Iroquois people relocated to southern Ontario in the region of Brant. In the Haldimand Treaty of 1874, the Haldimand Tract a 900,000 acre parcel, six miles on either side of the Grand River, was promised to the the Six Nations (Mohawk, Oneida, Onondaga, Cayuga, Seneca, Tuscarora) for their sole use forever.⁸ Within forty years, the crown expropriated and sold off nearly 90 percent of the original tract, with negligible benefit to its Haudenosaunee landholders. Today Six Nations is the largest populated First Nation in Canada. The Six Nations Elected Council is in active litigation requesting the accounting of assets owed to the council by the Crown.

The Grand River is a significant spine of settlement, urbanization, and industrial development. The river was a strategic location for a range of river-based industries, transportation, and energy-harnessing. Today, one million people live within the Grand Watershed, including populations in more concentrated urban areas of Kitchener, Waterloo, Guelph, Brantford, and Cambridge. Seventy percent of the watershed is currently dedicated towards agricultural land uses, twenty percent is covered by forest, and five percent is urbanized.

While the studio will consider the entire Grand River Watershed as the larger context, students will focus on one of three sites along the lower Grand River for the entire semester. Each of the sites bears different physical adjacencies, histories, land uses, water dynamics, and potentials. Each of the sites relates to a central aspect of contemporary landscape design, raising broader questions about the relationship between human-generated physical change and the more-than-human world, as what it means to develop and build in an unresolved Haldimand Treaty land.

Site 1. River as Energy & Urbanism: Parkhill Dam to Main Street Bridge, Galt. This site, stretching from north of the Parkhill Dam towards downtown Galt engages the town's industrial history—the harnessing of river energy to power mills and factories. Today the town is largely cut off from up-close river access and the dam isn't actively gathering energy. In 2017, the Grand River Conservation Authority passed an agenda to re-activate Parkhill Dam as a hydroelectric generating plant for local use, and preliminary work was started. With the recent change in Provincial Government, this plan was cancelled along with hundreds of other renewable energy contracts; however for the purposes of this studio, students will imagine that the plan might be reinitiated.⁹ This site provides an opportunity to reconsider how river energy is rendered and experienced, and how this might catalyse the reconnection of the town of Galt with the experience of the river.¹⁰

Site 2. River as Habitat & Post-Industrial Landscape: Brantford Gravel Pit. This site, a former riverside

⁸ See Six Nations Council, *Six Miles Deep: Land Rights of the Six Nations of the Grand River*, 2015, <http://www.sixnations.ca/SixMilesDeepBooklet2015Final.pdf>

⁹ Ray Martin, "Power project at Cambridge dam has been cancelled," July 22, 2018. <https://www.therecord.com/news-story/8756023-power-project-at-cambridge-dam-has-been-cancelled/>

¹⁰ Grand River Conservation Authority, Parkhill Dam Hydro Project, 2017, <https://www.grandriver.ca/en/who-we-are/Parkhill-Dam-hydro.aspx>

gravel pit is one of many in the area that are excavated for construction and commercial products. After their industrial use, quarries and gravel pits must legally be rehabilitated. This site provides an example of post-industrial landscape transformation, with incoming suburban residential development on one side. We will focus on the use of this land towards programming to support the Grand River fishery, towards the recreational, ecological, and educational dimensions of fishing in the grand.¹¹

Site 3. River as Cultural Landscapes & Entrepreneurship: Six Nations Tourism, Chiefswood Park, Ohsweken. Chiefswood Park in the Six Nations Reservation in Ohsweken has just been transferred to the management of Six Nations Tourism.¹² This park hosts an annual powwow accommodating 10,000 visitors, a boat launch and canoe club that works with youth in the context of the Carolinian forest. Six Nations Tourism envisions a new public landscape that connects the park with the river, provides ecological/cultural programming, provides jobs for the community, and supports kayak and canoe activities, all adapting to the increasingly flood-prone landscape. This site offers an opportunity to bring together design with the dynamics of flooding, cultural tourism, and ecological education as a means to support the entrepreneurial agendas of Six Nations Tourism.

3. STUDIO STRUCTURE

The semester involves three sequential projects which allow students to focus on their site in three different ways: first, an examination of how river and landscape processes shape land, second, of how human activities have shaped the river, and third, a design proposal which will ask you to address specific programs through the river processes and research of the first two projects. Each of the projects begins with or involves a site visit. As site is the subject of this studio, examining, occupying, and dwelling in the site is part of your work. Each of the projects requires drawing from the site, taking measurements, gathering materials, making observations, and meeting with local stakeholders. Rather than seeking the answers online, the aim of this semester is to see what you can learn from observing things in motion and cross-checking them with other sources including archives, newspapers, cultural projects, and discussions with stakeholders.

Project 1: Fluvial Process and Form: Turbulence, Deposition, Inhabitation (3 1/2 weeks, group work). In the first project, you will observe, document, model, and draw a particular fluvial process near to your site, based on a site visit and supplemental research. The project ends with a brief design exercise in which you are asked to design a device to work with the river process and enable users to experience it.

Project 2: Social Process and Form: Excavating, Harnessing, Paddling (2 weeks, group work). In the second project, groups will examine how human use and occupation have shaped the Grand River watershed through the extraction of materials, channeling of the river's edge, harnessing of energy, and use of its waters. Students will delve into site research including social and biophysical history as well as potential design directions through the study of relevant design precedents.

Project 3: Designing from the Riparian Zone (6 1/2 weeks, individual work) In this final project, students will address specific program requirements of their different sites specifically engaging river or landscape processes from Project 1 and research from Project 2. A final site visit to ground-truth, paddle through the site in a canoe, and stake out preliminary design ideas on site will take place mid-project.

Workshops. Workshops are organized to provide an introduction to resources and tools that will be useful for each of the projects, see Schedule. **Common Waters.** A student-led exhibition titled *Common Waters*, will bring a set of projects, speakers, and events this summer to the Idea Exchange and Design at Riverside Gallery. Our studio will attend and participate in Common Waters in a number of ways. **ARCH225.** This studio is closely coordinated with [Arch225: Theory and Design of the Contemporary Landscape](#). Arch225 lectures, readings, and precedent studies will be geared towards supporting the studio process while also providing a broader introduction to the discipline of landscape architecture.

¹¹ Grand River Conservation Authority, *Fishery Management Plan*, 2013, https://www.grandriver.ca/en/our-watershed/resources/Documents/Fishery/Fishery_ManagementPlan_Update2013.pdf

¹² Six Nations Tourism, <http://www.sixnationstourism.ca/>

| | Sunday | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday |
|------|--------|---|---|---|---|--------|----------|
| WK1 | 5 | 6 P1 Introduction AM: Studio Introduction; (JH) PM: Studio | 7 | 8 | 9 SITE VISIT I / Groups visit their own sites | 10 | 11 |
| WK2 | 12 | 13 P1 Group Crits AM: Studio PM: Studio; <u>Workshop:</u> Casting/modeling (Maddi) | 14 | 15 | 16 P1 Group Crits AM: Loft PM: Loft | 17 | 18 |
| WK3 | 19 | 20 <i>Victoria Day</i> | 21 | 22 | 23 P1.1 Due/Group Crits AM/PM: Loft Plot Deadline 11PM | 24 | 25 |
| WK4 | 26 | 27 P1.1 and 1.2 Review AM: Loft PM: Loft | 28 | 29 | 30 P2 Introduction AM: Lecture: Water / Architecture (CP) PM: Studio; <u>Workshop:</u> Mapping (Dani) | 31 | 1 JUNE |
| WK5 | 2 | 3 SITE VISIT II / Grand River Transect | 4 | 5 <i>[225: A1 Due]*</i> | 6 P2 Group Crits AM: Studio PM: Studio | 7 | 8 |
| WK6 | 9 | 10 P2 Group Crits AM/PM: Studio Plot Deadline 11PM | 11 | 12 | 13 P2 Review AM: E-Classroom PM: E-Classroom | 14 | 15 |
| WK7 | 16 | 17 (<i>CommonWaterExh.</i>) Toronto Interview Day P3 Introduction; Lecture: LandscapeTectonics (RA) AM/PM: Studio | 18 <i>Cambridge</i> Interview Day | 19 <i>Cambridge</i> Interview Day <i>[225: A3.1</i> <i>Draft Due]</i> | 20 <i>Cambridge</i> Interview Day P3 Group Crits AM: Loft PM: Loft | 21 | 22 |
| WK8 | 23 | 24 (<i>JH Away</i>) P3 Workshop: Landform Modeling (Cam Parkin, MH, DK) AM: E-Classroom PM: E-Classroom | 25 | 26 <i>[225: A2 Due]</i> | 27 P3 Individual Crits AM: Studio PM: Studio | 28 | 29 |
| WK9 | 30 | 1 JULY <i>Canada Day</i> | 2 P3 Group Crits Plot Deadline 11PM AM: Loft PM: Loft | 3 | 4 P3 Mid-Term AM: Loft PM: Loft | 5 | 6 |
| WK10 | 7 | 8 P3 Individual Crits AM: Lecture: Atmospheres (SS); Studio PM: Studio | 9 | 10 | 11 SITE VISIT III / Groups visit their own sites / Paddle + Ground Truth | 12 | 13 |
| WK11 | 14 | 15 P3 Group Crits AM: Loft PM: Loft | 16 | 17 <i>[225: A3 Due]</i> | 18 P3 Individual Crits AM: Studio PM: Studio | 19 | 20 |
| WK12 | 21 | 22 P3 Group Crits AM: Loft PM: Loft | 23 | 24 | 25 P3 Individual Crits AM: Studio PM: Studio | 26 | 27 |
| WK13 | 28 | 29 P3 Individual Crits AM/PM: Studio Plot Deadline 11PM | 30 | 31 P3 Final Review | | | |

4. OBJECTIVES

Students in this studio are expected to:

- Understand the **role of research** (site research, precedent research) in generating ideas about landscape, site, program, and tectonics.
- Develop and articulate a **critical position** relative to site and program.
- Demonstrate analytic and **representation skills** in relation to landscape and architecture systems.
- Engage **site history and conditions** as subject and context of design, including microclimate.
- Develop a basic understanding and application of **river and other landscape processes, topographic** contours, ground materials, and landform manipulation
- Develop a basic understanding of the spatial form and ecological role of **vegetation** (trees, shrubs, and perennials) in design.
- Develop an understanding of landscape interventions and how they change over time.
- Develop a project **across a range of scales**, from site strategy through to structural and tectonic considerations.
- Develop an understanding of **materials** and how they are assembled whether tectonic, stereotomic, or live (vegetation, water) materials.
- Demonstrate the ability to work in groups and **communicate verbally and graphically** within a small group and more public setting.
- **Actively participate and attend** all desk crits, pin ups, reviews and lectures.

5. EVALUATION, SUBMISSIONS, COMMUNICATIONS, FEES

| Assignment | % | |
|---------------|--------------|-----|
| Project 1 | | |
| | 1.1 | 15% |
| | 1.2 | 5% |
| Project 2 | | 10% |
| Project 3 | | |
| | Mid-Review | 20% |
| | Final Review | 40% |
| Participation | | 10% |

Evaluation. Specific requirements and evaluation criteria will be described in each project statement. You must receive a passing grade in Project 3 in order to pass the course.

Participation. Participation is extremely important in making a positive studio culture and in supporting your individual work. In this studio, participation is defined as showing up consistently and on time for all studio-related activities, engaging in lectures and group discussions, and providing constructive feedback to your peers during pin-ups and seminar discussions. Working on studio work during all studio hours is mandatory. Absence from studio without a valid personal or medical reason (with appropriate documentation) will lead to a 5% penalty towards your final grade for each day missed. If you miss three or more desk-crits, reviews, lectures without satisfactory documentation and explanation, you will receive a 0 for your participation grade. Presentations at reviews are mandatory, and failure to do so without prior agreement will lead to a 10% grade deduction on the project, over and above any late penalties that may apply. All students are expected and required to be present for their peers review throughout all review days.

Submissions. While hard copy plots are required for all pin-ups and formal reviews (unless otherwise stated), digital submissions to the LEARN site are also required with each review. For all digital upload submissions, it is your responsibility to verify that the upload worked. Deadlines for digital submissions will be on or in the few days following a review to allow you to take high quality photographs of your models to include in your submissions.

All digital submissions should named according to the following format:

ARCH293_S19_Last name_First name_Assignment number

Late Submissions. All assignments are due at the specific time and date given. Project deadlines can be extended only in cases illness or special circumstances. Requests for such extensions must be made before the project deadline to the studio coordinator using the Request for Extension form from the front office, and be accompanied by a medical certificate when appropriate. Work submitted after the hand-in date and time without a confirmed extension will be subject to a penalty of 10% per day thereafter, and after for days a mark of zero will be recorded for the project.

General communications with the studio will be handled through LEARN. Through the LEARN site you'll have access to all studio documents, readings, project statements, and presentations. Please ensure that you are receiving notices and contact faculty if you're not. Email jane.hutton@uwaterloo.ca for questions and issues related to the studio.

Office Hours are by appointment. Email individual instructors and TAs to arrange appointments. **Studio Site Visits Fees.** The course emphasizes inhabiting and studying sites and so there are a series of three site visits. We will provide details about the fees early in the semester.

6. READINGS (* are on course reserve in the Musagetes Library, +will be posted on LEARN) Note that many course readings from ARCH225 will be applicable to this studio.

Fluvial Dynamics / River Science

*+William Marsh, "Streams, Channel Forms, and the Riparian Landscape", in *Landscape Planning: Environmental Applications, Fourth Edition*. New York: Wiley, 2005.

*+Ellen Wohl, "Introduction; Chapter 2: Creating Channels and Channel Networks; Chapter 3: Water Dynamics; Chapter 4: Fluvial Sediment Dynamics; Chapter 5: Channel Forms; Chapter 6: Extra-channel Environments – Floodplains; Chapter 7: Humans and Rivers", *Rivers in the Landscape*, New York: Wiley, 2014.

*+Simon Bell. "Landform Patterns and Processes" in *Landscape: Pattern, Perception, and Process*, Routledge, 2012, pp. 143-179.

*+ Kirstie A. Fryirs and Gary J. Brierley, *Geomorphic Analysis of River Systems*, Wiley Blackwell.

Site

+ Rosalind Krauss, "Sculpture in the Expanded Field" *October* Vol. 8 (Spring, 1979), pp. 30-44

+ Christophe Girod, "Four Trace Concepts in Landscape Architecture," in *Recovering Landscape*, James Corner (ed), 2009, p. 58-67.

+ Martin Hogue, "Matter: Displaced, Organized, Flattened," in *Landscript 5: Material Culture*, Jane Hutton (ed), Jovis Verlag: Berlin, 2017.

+ Carol Burns, "High-Performance Sites," in Burns, Carol, and Andrea Kahn, eds. *Site Matters*. 1 edition. New York: Routledge, 2004. p. 297-310

+ Kristina Hill, "Shifting Sites," in, Burns, Carol, and Andrea Kahn, eds. *Site Matters*. 1 edition. New York: Routledge, 2004. p. 131-

*Ivan Illich, *H2O and the Waters of Forgetfulness*.

River Design

*Martin Prominski, *River, Space, Design: planning strategies, methods and projects for urban streams*, Basel : Birkhäuser, 2012.

*Betsy Otto, McCormick, Kathleen, *Ecological riverfront design : restoring rivers, connecting communities*, Chicago, IL : American Planning Association, 2004.

*Thaisa Way, *River City, City Rivers*, Dumbarton Oaks Research Library and Collection.

*Catherine Seavitt Nordenson, *Structures of Coastal Resilience*, Island Press, 2018

*Anthony Acciavatti, *Ganges Water Machine : Designing New India's Ancient River*, San Francisco : Applied Research + Design Publishing 2015.

The Grand River / Six Nations

Six Nations of the Grand River, "Land Rights: A Global Solution For the Six Nations of the Grand,"
<http://www.sixnations.ca/SNGlobalSolutionsBookletFinal.pdf>

Susan M. Hill. *The Clay We Are Made Of: Haudenosaunee Land Tenure on the Grand River*. Winnipeg: University of Manitoba Press, 2017.
<http://ebookcentral.proquest.com/lib/waterloo/detail.action?docID=5219774>.

Phil Monture, *A Global Solution for the Six Nations of the Grand*. Lecture: University of Waterloo School of Architecture, Feb. 3, 2017. https://www.youtube.com/watch?v=G_BQiOc8m2E

Six Miles Deep: Land Rights of the Six Nations of the Grand River, 2015,
<http://www.sixnations.ca/SixMilesDeepBooklet2015Final.pdf>

Carly Lynn Kandrack: Guiding the Grand: Journeying into the Grand River's Diverse Histories. UWSA Masters Thesis. *UWSpace*. <http://hdl.handle.net.proxy.lib.uwaterloo.ca/10012/13857>

* Grand River Conservation Authority, *Canoeing on the Grand River : a canoeing guide to Ontario's historic Grand River*, Cambridge, Ont. : The Authority, 1994.

* Carl E. Hiebert, *The Grand River: an aerial journey*, Grand River Conservation Authority. Cambridge, Ont. : Grand River Conservation Foundation, 2003.

* Nelson, James Gordon, *The Grand River watershed : a heritage landscape guide*, Waterloo, Ont. : Heritage Resources Centre, University of Waterloo c2003 .

*Grand River Fisheries Implementation Plan Ontario. Ministry of Natural Resources. Grand River Conservation Authority; Canada, 2001.

6. ACADEMIC INTEGRITY, GRIEVANCE, DISCIPLINE, APPEALS, AND STUDENTS WITH DISABILITIES

Academic integrity: In order to maintain a culture of academic integrity, members of the University of Waterloo community are expected to promote honesty, trust, fairness, respect and responsibility. [Check the Office of Academic Integrity for more information.]

Grievance: A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. Read Policy 70, Student Petitions and Grievances, Section 4. When in doubt, please be certain to contact the department's administrative assistant who will provide further assistance.

Discipline: A student is expected to know what constitutes academic integrity to avoid committing an academic offence, and to take responsibility for his/her actions. [Check the Office of Academic Integrity for more information.] A student who is unsure whether an action constitutes an offence, or who needs help in learning how to avoid offences (e.g., plagiarism, cheating) or about "rules" for group work/collaboration should seek guidance from the course instructor, academic advisor, or the undergraduate associate dean. For information on categories of offences and types of penalties, students should refer to Policy 71, Student Discipline. For typical penalties, check Guidelines for the Assessment of Penalties.

Appeals: A decision made or penalty imposed under Policy 70, Student Petitions and Grievances (other than a petition) or Policy 71, Student Discipline may be appealed if there is a ground. A student who believes he/she has a ground for an appeal should refer to Policy 72, Student Appeals.

Note for students with disabilities: AccessAbility Services, located in Needles Hall, Room 1132, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with AccessAbility Services at the beginning of each academic term.

Accommodation: Should students require accommodation due to illness, they must provide a Verification of Illness Form to support their requests. [Check <https://uwaterloo.ca/registrar/current-students/accommodation-due-to-illness> for more information.] **Exam Period Travel:** Student travel plans are not considered acceptable grounds for granting an alternative examination time.