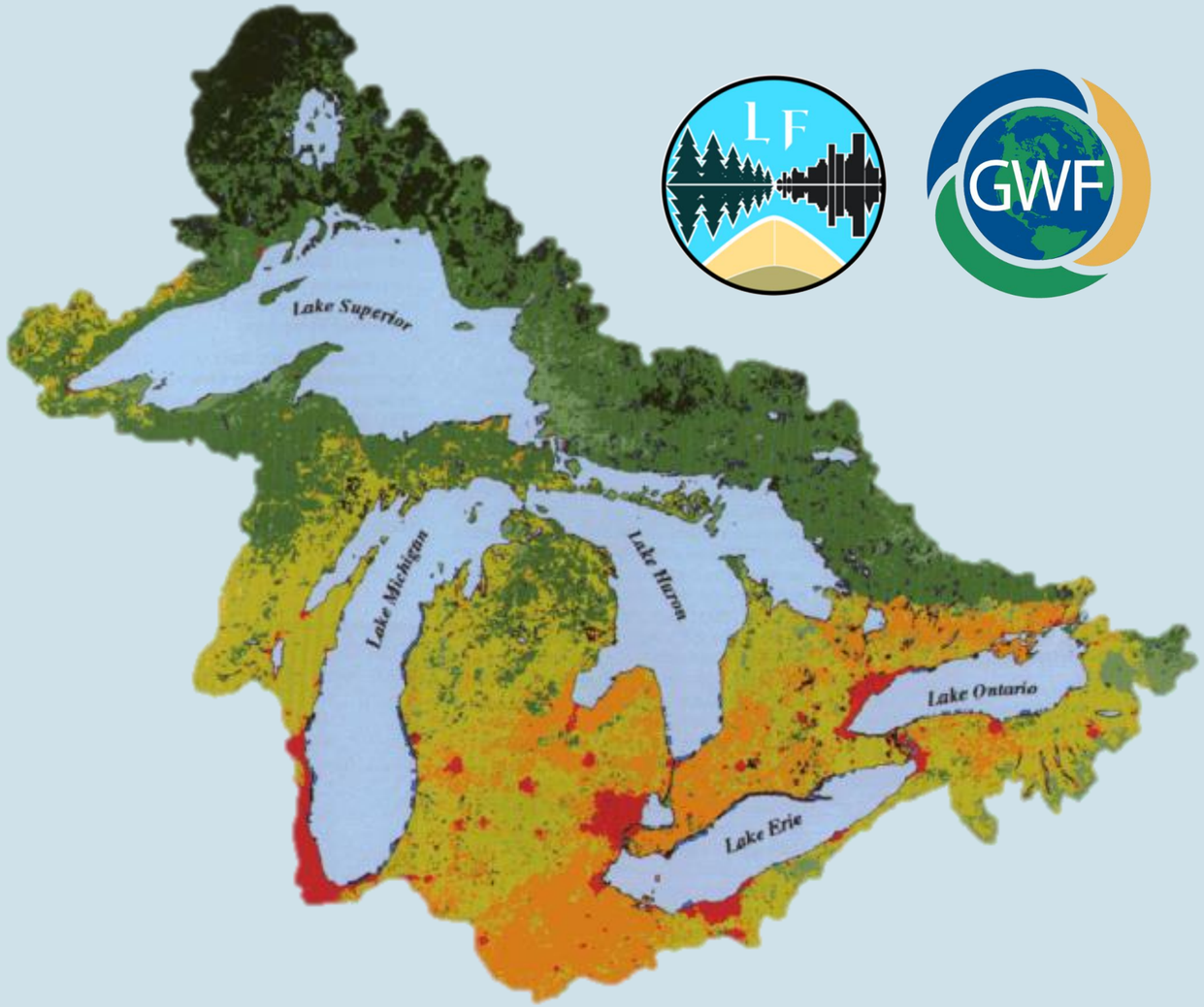
Lake Futures Webinar Series

Learn about the latest research findings from the Lake Futures project and discuss implications for water policies, programs and plans in Ontario.

Wednesdays 1-2pm EDT

Lake Futures: Enhancing Adaptive Capacity and Resilience of Lakes and their Watersheds



PI: Basu

4 Universities
21 Faculty Researchers

Key themes:

- Land based pressures on lake ecosystems
- Biogeochemical responses of lakes
- Develop and test ecosystem indicators
- Socioeconomic drivers
- Integration to deliver decision support tools

Webinar Logistics

- Please use the Q&A feature to post all questions
- Use the chat box to share general comments, ideas and engage in the dialogue
- This webinar will be recorded and made available for later viewing

A new approach and lessons learned:

How co-creation, shared spaces, and diversity can improve water monitoring design

Elaine Ho | e23ho@uwaterloo.ca

Lake Futures Webinar Series | September 16, 2020 | 1-2pm

UNIVERSITY OF WATERLOO | FACULTY OF ENVIRONMENT

What are the issues?

Conventional long-term water monitoring programs in Ontario are generally designed in siloed institutions that have changed little (in form or function) in a century. Agency values and practices have changed slower than the pace of society…

- Lack of diversity represented in priorities, design – elitist
- Monitoring capacity decreased over the last 40 years
- Diminished connection between monitoring and decision making

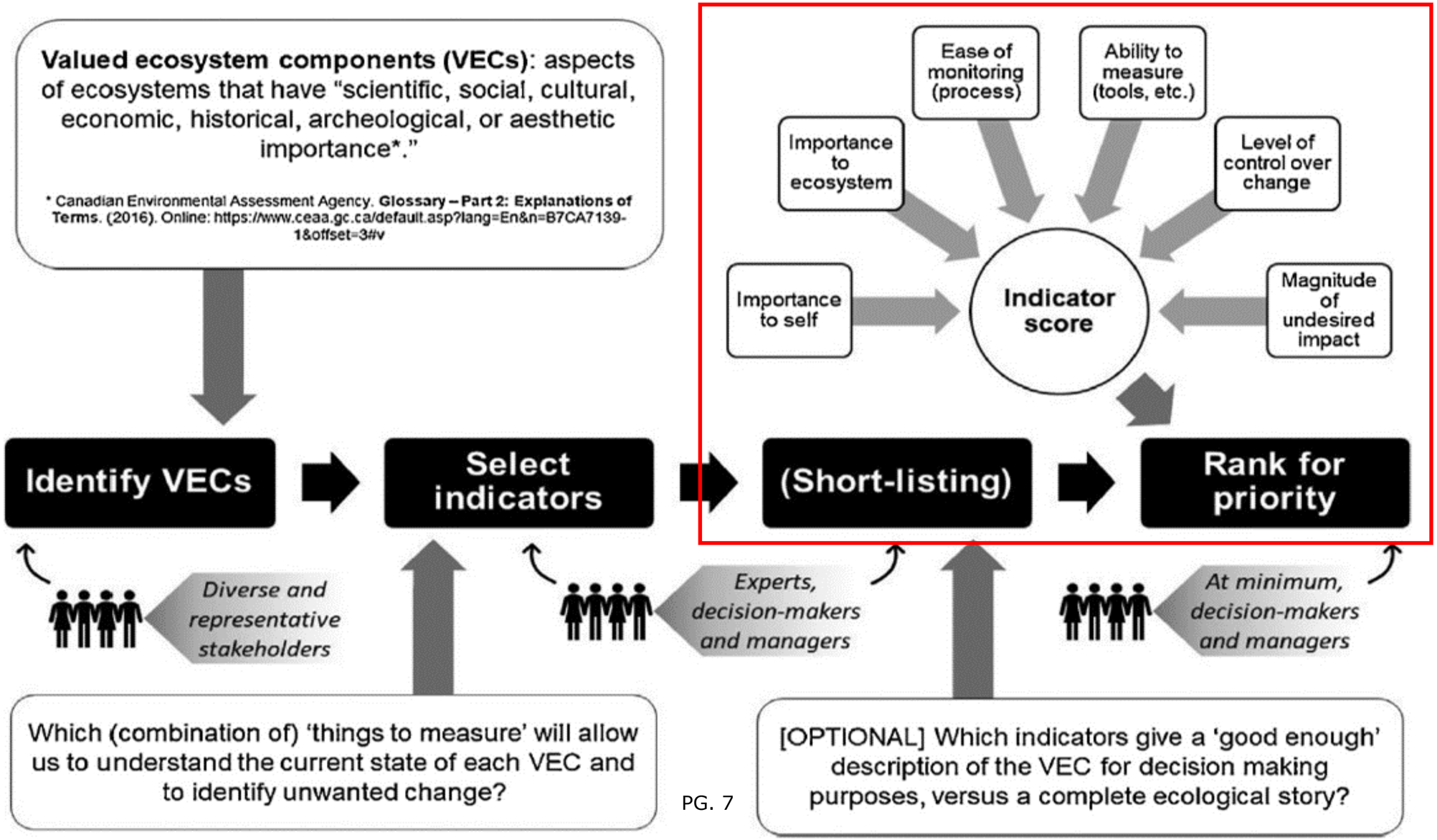
Research goal: Develop a monitoring framework that considers cumulative effects, is co-created by diverse stakeholders, and that connects monitoring to broader river or lake management decisions.

What did we do?

1. Exploratory study – Jan-Aug 2016 – Muskoka River Watershed – published 2018
2. Initiated Indigenous engagement (relationship building) – Jul 2018-Feb 2019
3. Monitoring review – May 2018-Dec 2019 – published 2020
4. Participant observation
   - Grand River Fisheries Management Plan Implementation Committee – Jan-Jun 2018
   - Canadian Water Resources Association workshop – May 2019
5. Key informant interviews – Feb-May 2019
6. Public engagement – Jun-Aug 2019
7. Indigenous youth engagement – Aug 2019-Aug 2020

…Upcoming: two workshops (October 5, 2020 and mid-November)

Exploratory: criteria-based ranking for indicator selection



Usable (reporting)

Quantifiable

Can be managed (x2)

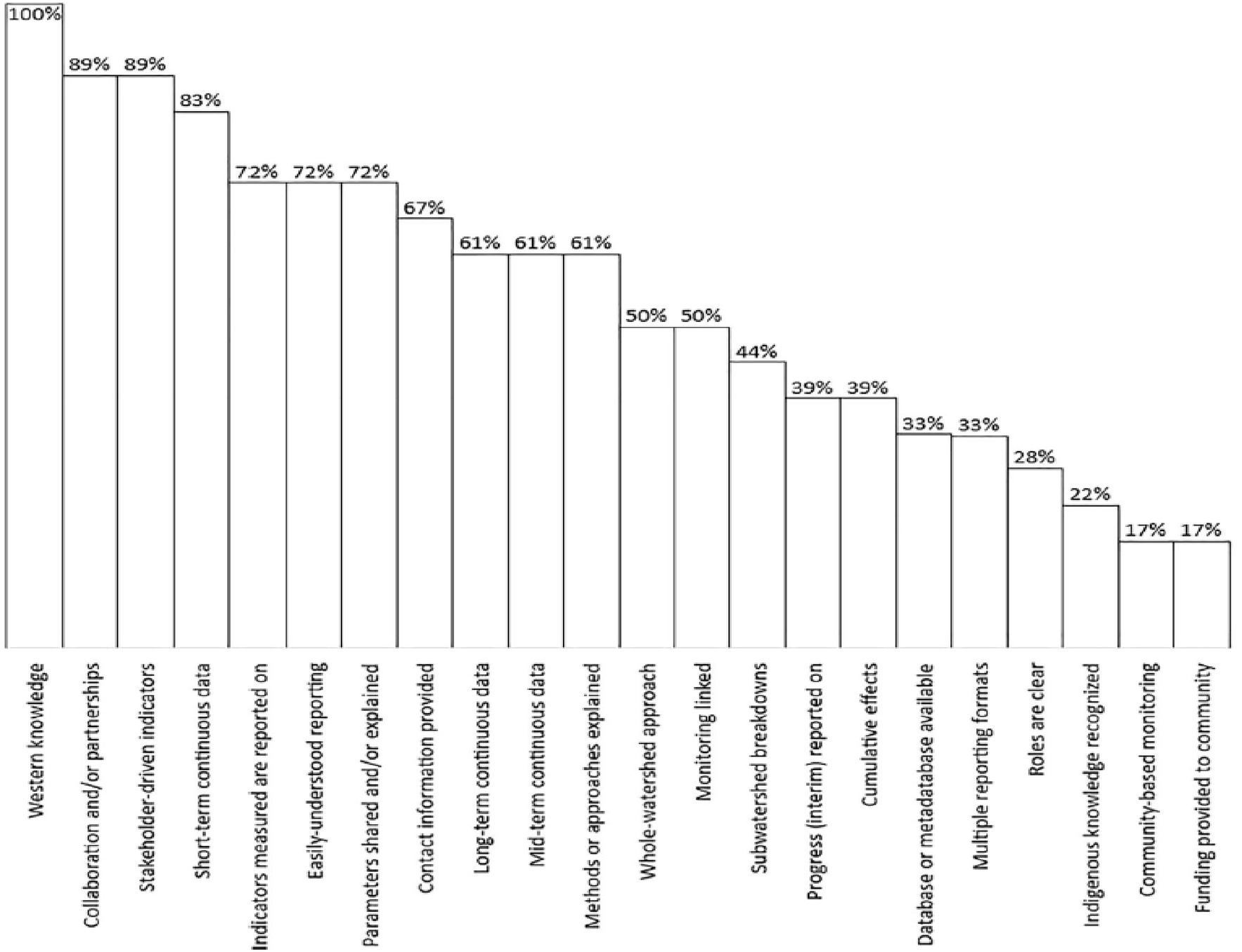
Threats

Personal priority

Criteria	Indicator*					
	Secchi Depth	**Algae**	**Calcium**	**Land Use**	**Wetland cover**	**Footprint (new)**
I would include this indicator, by this or other name, in the Report Card (e.g. not just in the Background Report)	17	31	23	33	32	27
This indicator is measurable given reasonably expected resources (tools, people, funds, time…)	33	22	25	30	25	20
We have control over changes to this indicator	18	20	18	27	24	23
We have effective mechanisms for correcting CURRENT unwanted changes to this indicator	16	19	16	25	19	20
We have effective mechanisms for correcting FUTURE unwanted changes to this indicator	20	21	17	27	21	20
Unwanted changes to this indicator would result in serious impacts (directly or indirectly) on ecological and human systems.	22	31	27	31	28	30
This indicator is important to me	24	31	25	34	31	28
Total Score	**150**	**175**	**151**	**207**	**180**	**168**
Rank – short-listed?	**6 – No**	**3 – Yes**	**5 – Yes**	**1 – Yes**	**2 – Yes**	**4 – Yes**

Monitoring review:

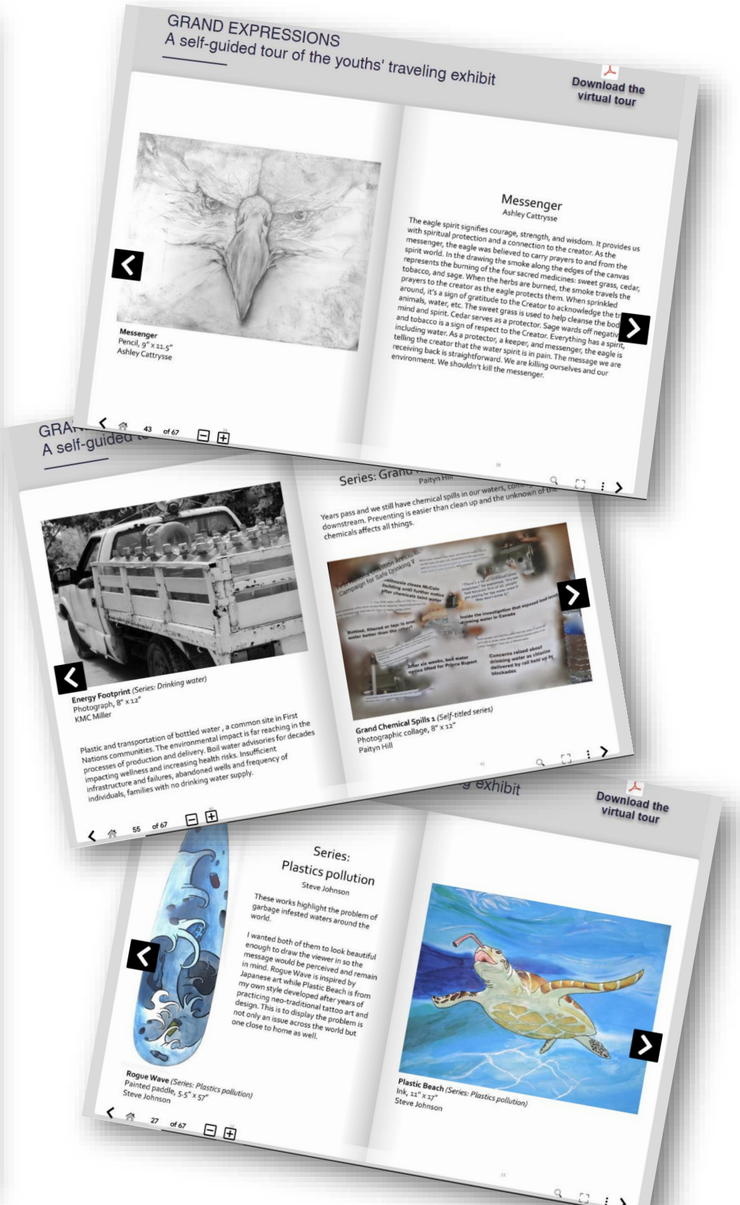
Cumulative scores for all criteria



Monitoring review recommendations

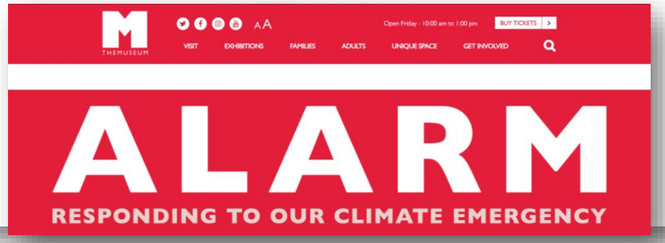
1. Recognize different knowledge approaches (especially Indigenous)
2. Use multiple reporting formats
3. Clarify monitoring and management roles
4. Use water quantity, quality, and biomonitoring together (where relevant)
5. Link monitoring to management and decision making

Indigenous youth engagement: Grand Expressions



Grand Expressions Virtual Exhibit featured at THEMUSEUM

Elaine Ho, PhD Student with the Lake Futures project, is having her Grand Expressions virtual art exhibit featured at THEMUSEUM as part of the ALARM Exhibition. Grand Expressions is a collaboration with Six Nations youth to inform water managers in a culturally relevant way.



What's the end result?

- **Goal**: Develop a monitoring framework that considers cumulative effects, is co-created by diverse stakeholders, and that connects monitoring to broader river or lake management decisions.

- **Result**: proposed framework for Grand River Estuary Working Group (potential other EWGs in estuaries across Great Lakes, perhaps linked to binational work).
  - The **framework** is the proposed ***organization*** of different organizations, persons, values, processes, actions, and outputs/outcomes.
  - The **process** is proposed sequence of ***iterative steps*** in which the framework is translated from an abstract concept into concrete action.

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Process highlights

- Stakeholders and rightsholders define their own roles
- Partnerships and collaboration are the foundation of implementation
  - Citizen science, partnerships with academic institutions, etc.
- Integration of Western and Indigenous knowledge forms (problem definition, data collection where possible, narratives and reporting)
- Cumulative effects considered using analysis tools (e.g., system mapping, Bayesian networks, other models)
  - Incorporate short and long-term data, as well as combination of water quality, quantity and biomonitoring data

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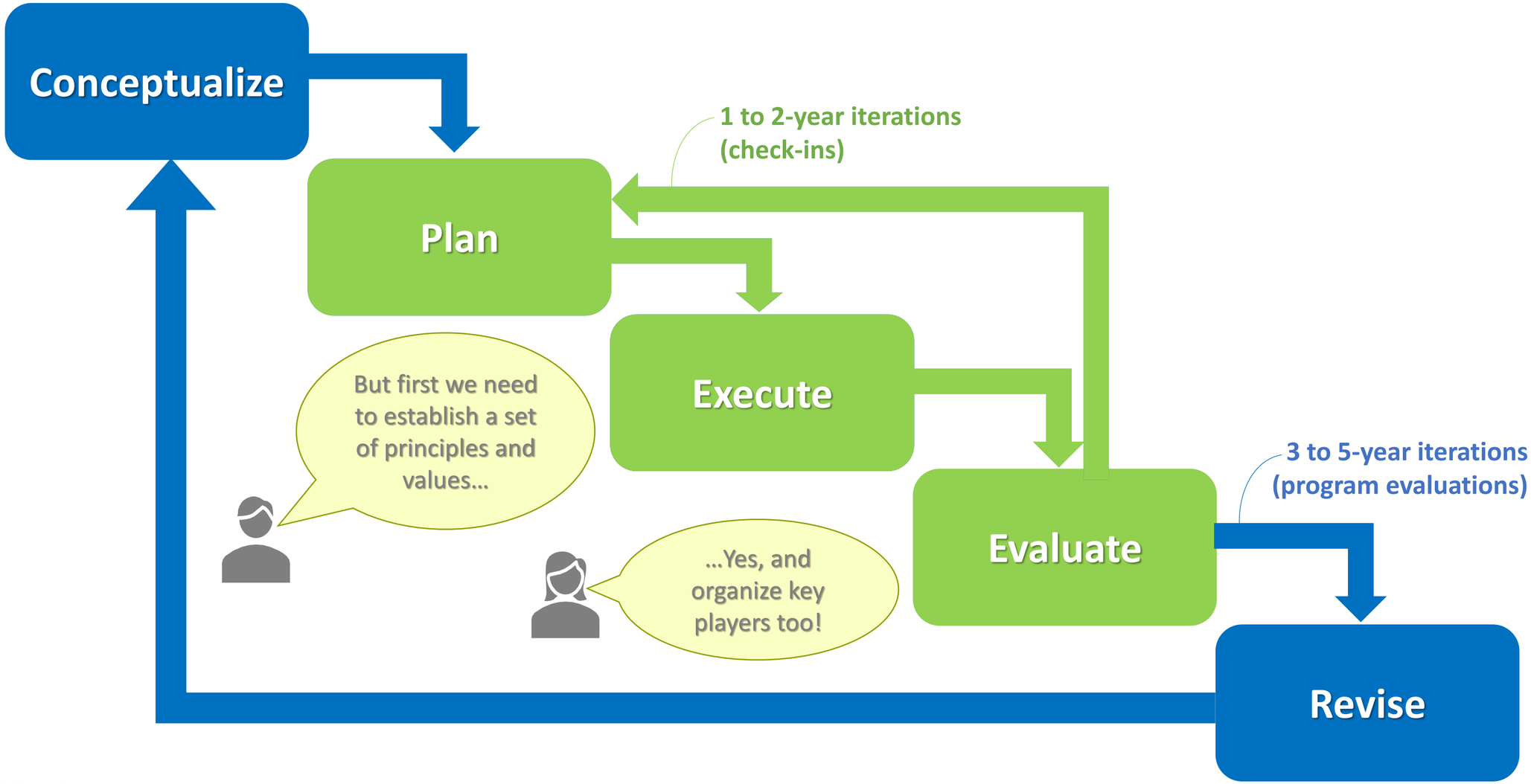
Proposed adaptive monitoring process



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Adaptive framework

- 1-year design phase for collaboration and relationship building

- Adaptive monitoring and management cycles: annual or bi-annual check-ins (annual recommended) and whole-program review every 3-5 years
    - Whole-program review should follow turnover of Provincial government as closely as possible, no less than 3 years after the previous review, no more than 5 years after.
    - 4 to 5-year reviews should be satisfactory given interim check-ins

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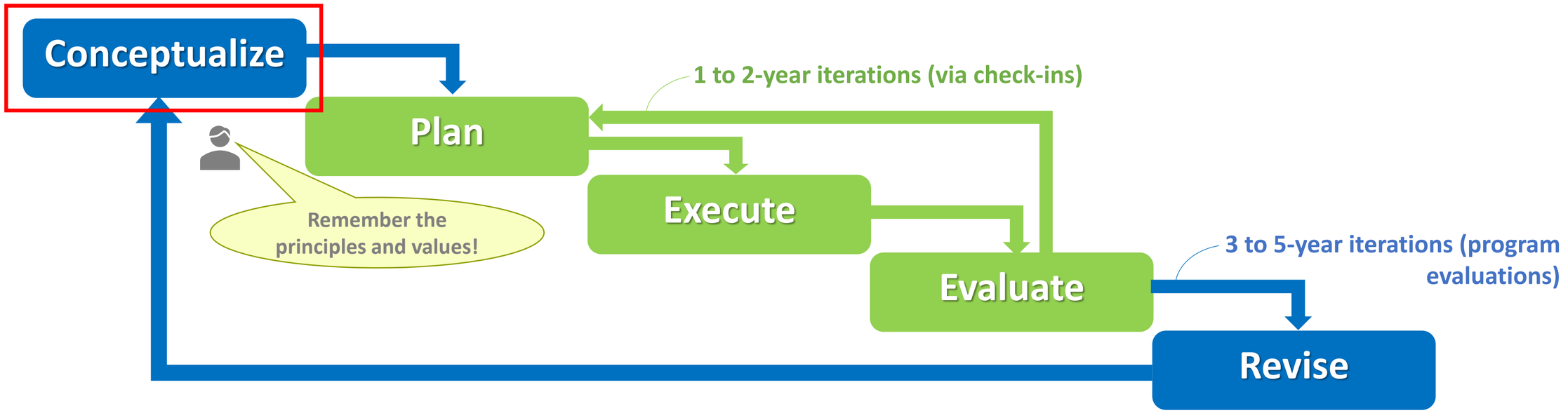
Principles and values

- Water essential; it provides sustenance for every organism on the planet
- Impacts are shared by all, though not equally
- What we put into the watershed returns to us in one form or another
- Manage as stewards, demonstrate gratitude finite resource and its provisions
- View humans as within nature, internal to problems; we are not separate
- Nation-to-nation histories must be openly acknowledged, and efforts made to reconcile (e.g., residents of the Haldimand Tract do not know what it is)
- Open, transparent communication and data sharing
- Iterative, adaptive processes do not fail, but improve – monitoring can empower management
- Collaboration is the basis on which we can explore complexities

Conceptualization

- Who will be involved?
- Engagement plan (how will they be involved, when, for how long?)
- Goals, scope, deliverables (including format of delivery)



Who will be involved?

- Leadership consists of two teams
  - Core planning and steering team (representative of interest groups or monitoring partners)
  - Coordination team (small group of dedicated/specialized staff)

- Additional person or team: knowledge broker(s) – works closely with coordination team, or has some overlap

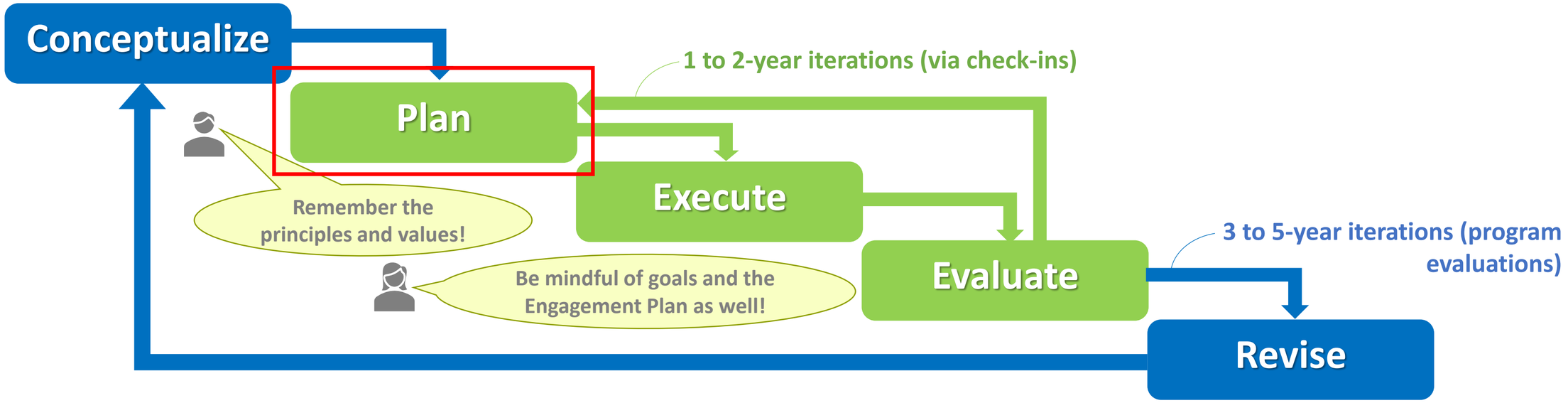
- Determine roles based on self-identified preference, organizational capacity, and ability to adapt to changes in priorities and/or processes

Recommendations

- Governments – long-term monitoring, implement political and legislative infrastructure
- Governments and water managers (incl. Conservation Authorities) – characterization, ongoing monitoring
- Water managers (incl. CAs) – facilitate collaboration and public education; monitoring to focus on mandated areas (e.g., flood mitigation) and characterization
- Universities – short-term (>5 years) research on specific issues, emerging phenomena, and assessing efficiencies or efficacy of decisions

Planning

- Logistics – timelines, budgets, roles
- Finalize monitoring questions, select indicators, determine monitoring protocols
- Risks and alternative approaches
- Evaluation approaches, criteria

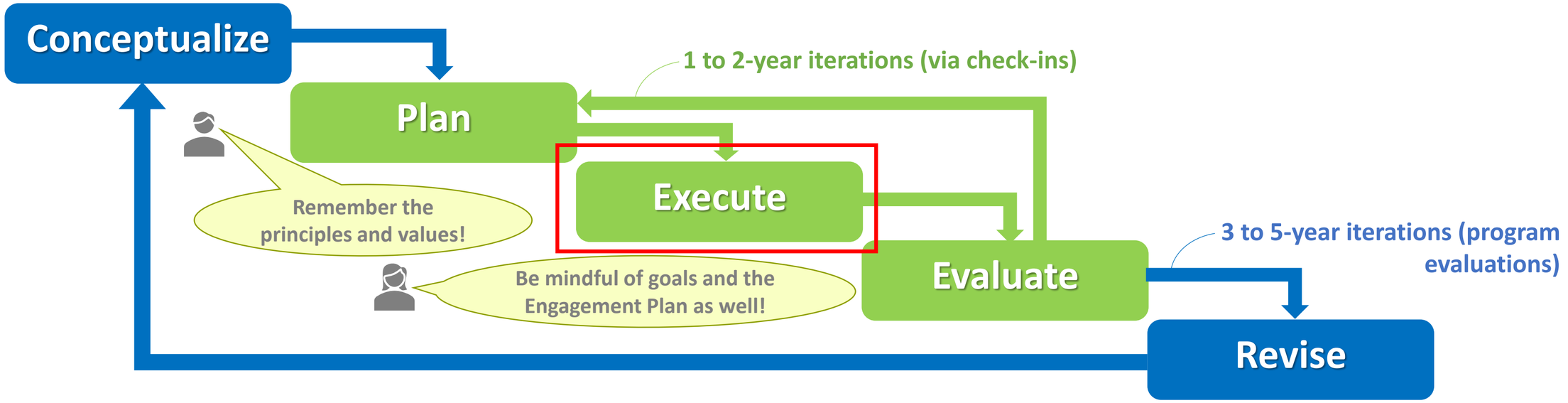


CE assessment built from conventional monitoring

Reason for monitoring	Questions of conventional monitoring	Questions of cumulative effects assessment
Characterization, baseline, ongoing monitoring	<u>Characterize *conditions*:</u> 1. What conditions exist? 2. What phenomena are normal? 3. What variability is normal?	<u>Characterize *relationships*:</u> 1. What relationships exist among parameters? 2. To what extent do these relationships drive known phenomena?
Issue-based monitoring (deep dive, test decisions, pilots, answer questions)	<u>Quantify impacts of separate stressors:</u> 1. How has the state of one or more parameters changed? 2. What stressors drive this issue?	<u>Quantify relationships among stressors:</u> 1. What interactions or combination of stressors influence the issue? 2. How can these relationships be leveraged to diminish/resolve the issue?

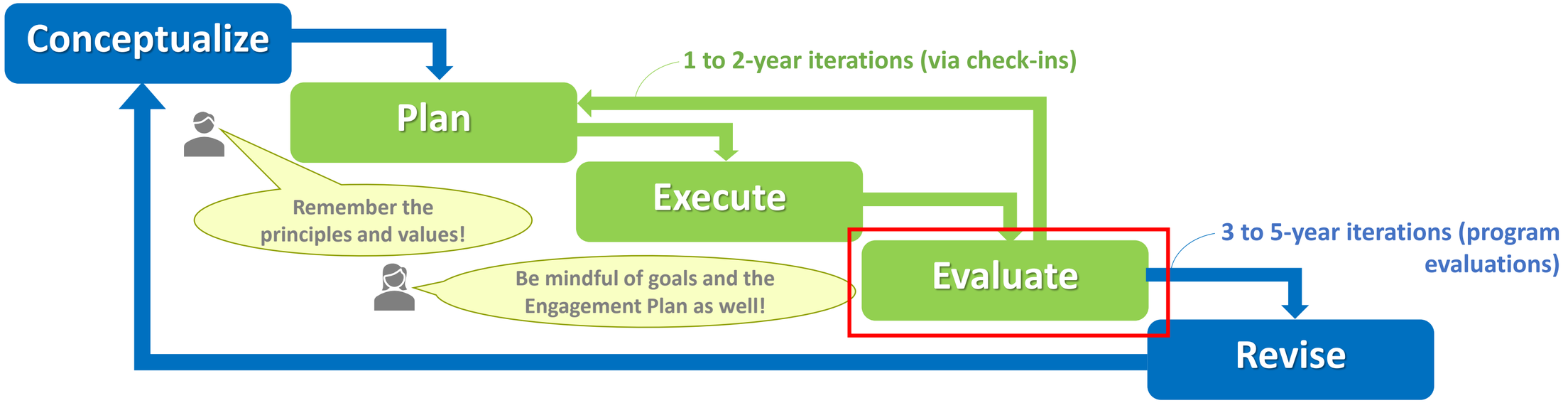
Execution (implementation)

- Monitoring – logistics and indicators
- Data analysis – determine ahead of implementation
- Reporting – formats, by who, to whom – knowledge broker
- Management – responses to information (incl. cost-benefit analyses)



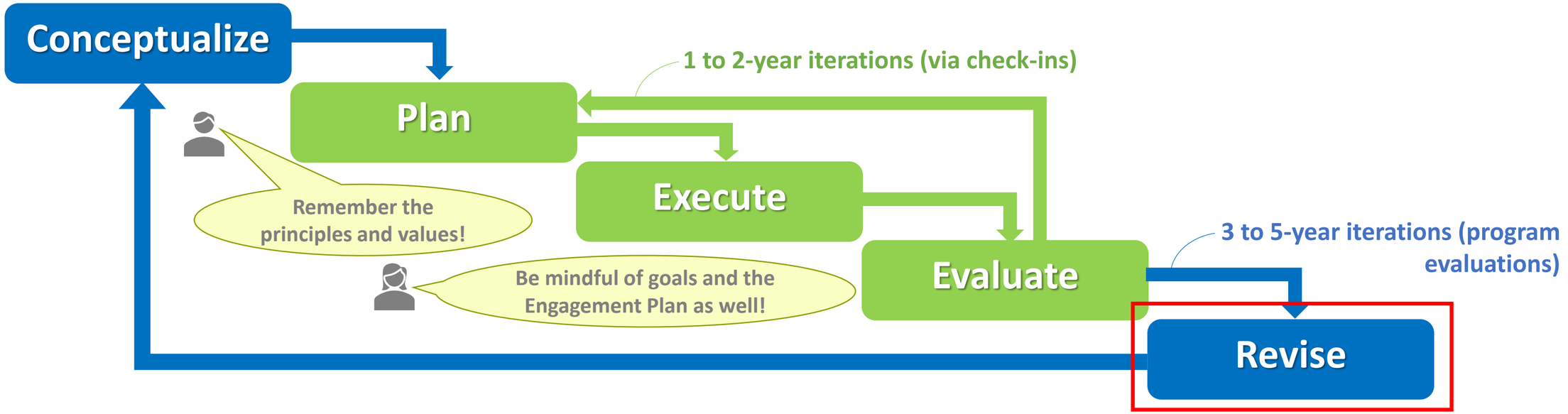
Evaluation

- *Check-ins* – keep tabs on surrounding areas (stressors *from* and effects *to* outside); raise any issues or share information; status updates on deliverables/analysis
- *Program evaluations* – ideally close to provincial turnover
- *Both* – check against goals, questions, deliverables; assess roles, communication, consultation/engagement, capacity



Revision

- Based on decision maker priorities
- Where program changes are made, ensure comparability of data and engagement of all parties necessary
- Succession planning for personnel, funding continuance, end of program process if needed (i.e., where data will be kept, etc.)



Challenges and lessons

- Ethical dilemmas – whose ethics?
  - Sometimes you need to push back on the system
- Historic relationships impeding current ones
  - Deliver on commitments, reciprocate; be genuine; prioritize the relationship over deliverables
- Scoping limitations (reciprocity?)
- Too many assumptions made (we don't always know as much as we think we do)
  - Monitoring personnel, decision makers – communicate!
  - Engage interested parties… if they're interested; if not, find out why

For more information…

- Contact me: e23ho@uwaterloo.ca
- Research website: www.GrandErieStudy.ca

- Publications
  - Exploratory study – reporting review (closed access)
  - Monitoring review – 5 recommendations (free read-only)
  - Criteria-based ranking process (open access)
  - Summary reports on the research website (“Resources”)

- October 5 workshop – contact me if interested/indicate in concluding survey

Q + A

- Please use the Q&A feature to post all questions
- We are interested in your input on how this information could be useful for your organization. Please use the chat box to share general comments, ideas and engage in the dialogue.
- If you are comfortable, please include your organization along with your questions or comments

Keep in Touch:

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Upcoming Webinars

Sept 23 **Nandita Basu:** Sustainable Urbanscapes: Nutrient Cycling in the Greater Toronto Area

Future webinars will be announced as they are confirmed.

Details and Registration:
uwaterloo.ca/lake-futures/webinar-series