F O R M ◯ B L O O M
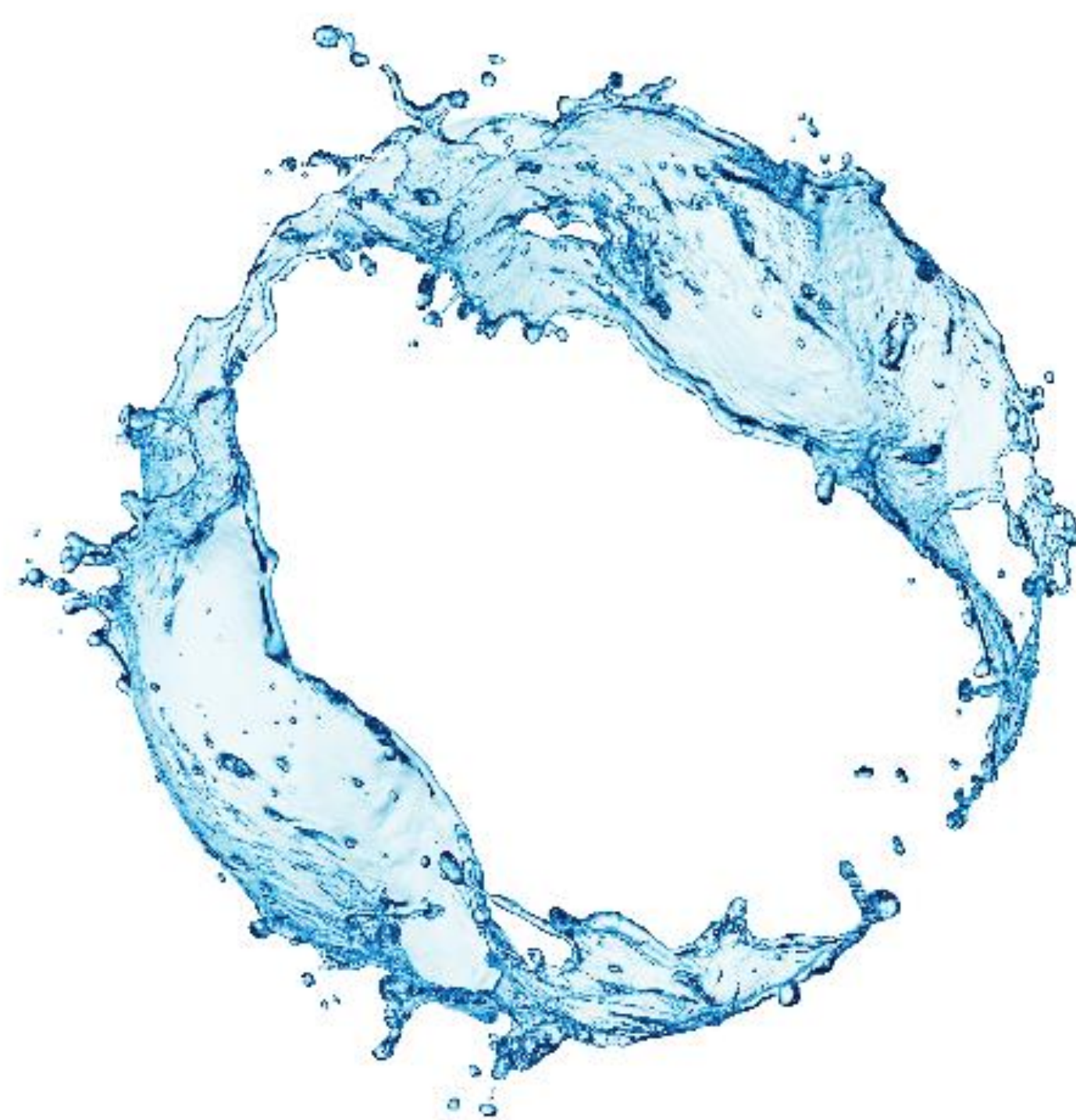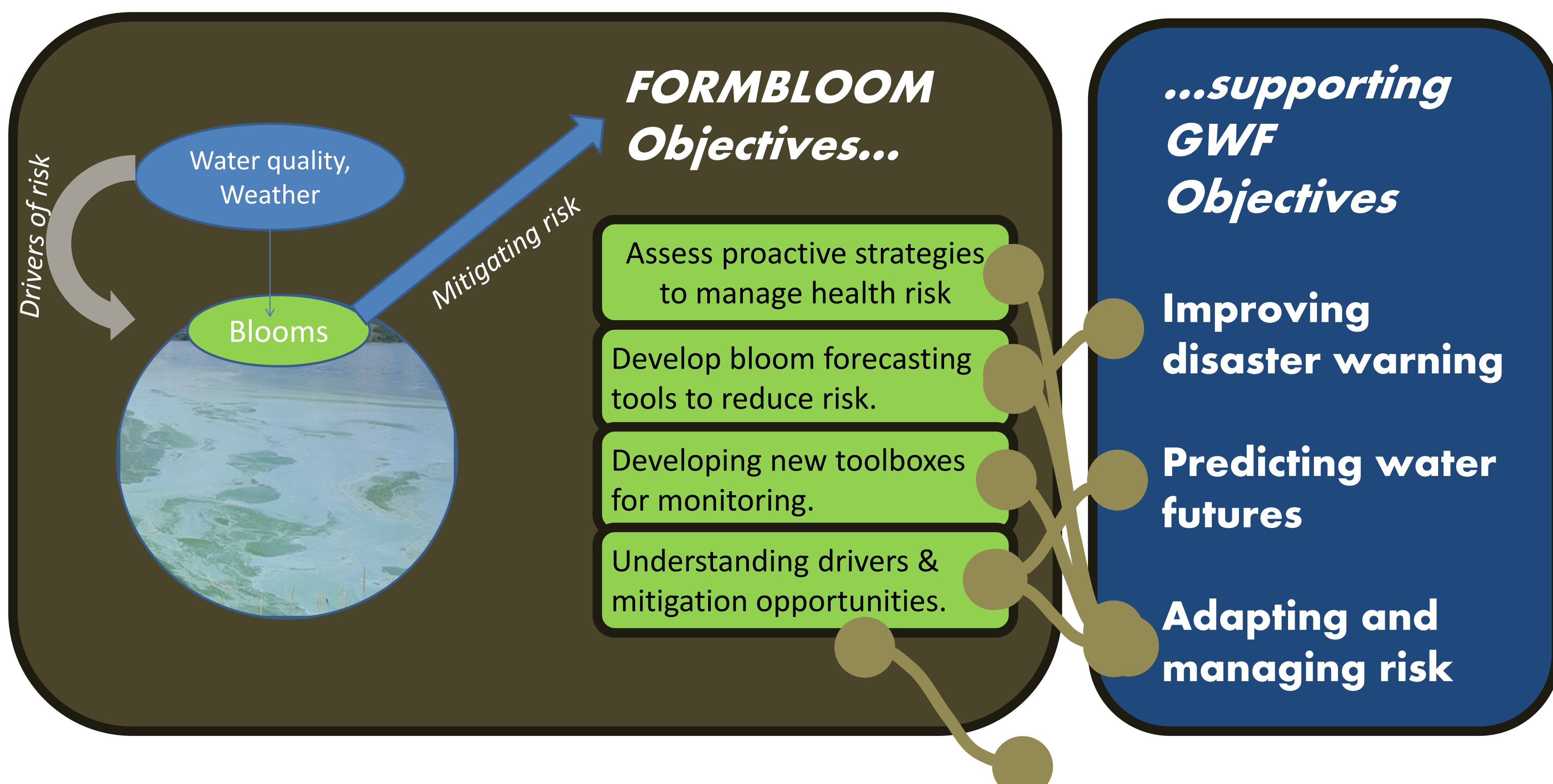
Rationale:

- Blooms are worsening globally, affecting key ecosystem services of lakes.
- Cyanobacterial blooms are particularly concerning, due to potential health impacts.
- Truly solving the issue of blooms, and lake eutrophication will require decades or longer, once appropriate actions are implemented. This is because legacy nutrient stores often exist within lakes and their watersheds.
- While phosphorus control may be the ultimate solution, slow progress in reducing phosphorus loads combined with urgent threats to key ecosystem services suggest that we need to consider other options that can lead to shorter-term relief of the symptoms of eutrophication and reduction of risks associated with harmful blooms.

FORMBLOOM Objectives...

Drivers of risk

Water quality, Weather

Blooms

Mitigating risk

- Assess proactive strategies to manage health risk
- Develop bloom forecasting tools to reduce risk.
- Developing new toolboxes for monitoring.
- Understanding drivers & mitigation opportunities.

...supporting GWF Objectives

Improving disaster warning

Predicting water futures

Adapting and managing risk

...& Supporting work towards the UN Sustainable Development Goals

3 GOOD HEALTH AND WELL-BEING

3.9 reduce deaths and illnesses from water contamination
3.D strengthen capacity for early warning, risk reduction and management of national and global health risks.

6 CLEAN WATER AND SANITATION

6.1 safe and affordable drinking water for all
6.3 improve water quality by reducing pollution
6.6 protect and restore water-related ecosystems

15 LIFE ON LAND

15.1 restoration of inland freshwater ecosystems and their services
15.5 reduce the degradation of natural habitats

Current evidence suggests the issue of blooms in Canada, and globally, will continue to become more severe. This work contributes new science and assess solutions to help reverse this trend while managing current risk. Here, we marry work on risk communication to bloom forecasting, monitoring and mitigation. Specifically, we apply new technology to develop forecasting tools. We will build an understanding of the conditions that lead to bloom initiation, growth and collapse – and will engage new genomics tools and toxin analyses to help understand how rapidly the risk associated with blooms can change, and why. We are supporting adaptation to bloom risk in the short-term, and are working towards novel strategies to mitigate bloom risk in the medium term.

learn more at formbloom.ca

Risk communications:
- Completed scoping review & stakeholder consultations to understand risk communications practices and their effectiveness,
- Data will inform the co-creation of new tools (guidebooks, exemplar notices, brochures, infographics, videos, radio briefs, etc.) for risk communications about blooms in the Prairies.

Bloom forecasting:
- Developed statistical approaches and machine-learning based approaches to bloom forecasting for key drinking water supply.
- Next steps involve testing approaches across additional lakes where high frequency data exist, and testing the hypothesis that stratification in polymictic lakes is a key antecedent condition to bloom onset.

New toolboxes for monitoring:
- Assessment of potential for satellite or drone based measurements to support cyanobacterial monitoring and prediction programs for small lakes.

From drivers to mitigation
- Through temporally intensive monitoring we have assessed conditions associated with bloom onset, continuation, and collapse, and are assessing factors affecting changing toxicity
- Grounded in three lakes which have diverse underlying geochemistry.