



# *Muskoka*

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## WATERSHED COUNCIL

### Minutes

Friday, May 19, 2023

1:00 pm

Pine Room (District of Muskoka) & Zoom

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#### Present (In-person)

Peter Sale (Chair)

Neil Hutchinson

Pete LeMoine

Chris Cragg (@ 1:35 pm)

Peter Johnston

Michael Peppard

Andrew Fyfe

Peter Kelley

Don Smith

#### Present (Zoom)

Nancy Alcock

Richard Lammers

Patricia Arney

David Parsons

John Cooper

Kevin Trimble

#### MWC Staff

Rebecca Willison

#### DMM Staff

Glenn Cunnington

Christy Doyle \*

Julia Rodgeron

#### Guests

Don Furniss

Ken Riley

Deborah Marcellus \*

Rohan Riley \*

Emma Berton (GBB) \*

Jennifer Pagnutte \*

Esther Giesbrecht

Marilyne Doyle \*

Bill Heatlie

Derek Densmore \*

Zack W \*

Laura Bonney \*

Barb Coomber

Karen Kivilahti \*

Bruce McNeely

Donna McNeely \*

Wendy \*

Lorne Booth \*

Bruce Coomber

\* Attended by Zoom

#### Welcome

MWC Chair Peter Sale called the meeting to order at 1:05 pm. MWC member Peter Kelley provided an Indigenous Land Acknowledgement.

#### Confirmation of Minutes

#### MOTION

Moved by Pete LeMoine, seconded by Peter Johnston

THAT the minutes of the Muskoka Watershed Council meeting dated April 21, 2023, be approved.

**CARRIED**

## **Business Arising from the Minutes**

- Dates and speakers are set up for all eight municipal presentations.
- There are five presentations booked at lake association AGMs throughout the summer.

## **Presentation**

### [Understanding Algae Blooms](#) – *Esther Giesbrecht, Leonard Lake Stakeholders' Association*

Esther presented on the Leonard Lake Stakeholders' Association's extensive monitoring program and how recent additional algae testing at Leonard Lake has provided valuable information about algal blooms.

After answering some questions, Peter thanked Esther for her informative presentation.

### [MWC Strategic Plan](#)

Pete LeMoine noted the extensive work Geoff Ross and he have put in to pulling the Strategic Plan together. The proposed Mission Statement is "To empower the community to protect and enhance watershed health". There are three overall goals identified to guide MWC's activities plus some additional goals that are more related to the organization of MWC (focussed on the Board of Director's activities) that won't be discussed today but are available to people who may want to review them and provide input.

Goal #1 – Communications, Stewardship and Awareness.

Objective: Increase the level of awareness and engagement of the community on watershed health and stewardship issues. A number of strategies and tactics have been developed for each objective, as well as measure of success. MWC members will need to step forward and take ownership of each tactic in order for them to become reality.

Goal #2 – Policy & Advocacy

Objective: planning decisions are based on:

- a) Current science as expressed in MWC position papers.
- b) IWM for the Muskoka River Watershed as a whole. Emphasize the cross municipal boundaries nature of watershed impacts.

Goal #3 – Enhanced Watershed-Wide Knowledge Base

Objective: Knowledge (science-based and traditional) of the Muskoka River Watershed as an ecosystem is adequate to support policies and action that effectively protect and enhance watershed health.

The remaining three goals specific to the Board of Directors are Membership Recruitment and Retention, Revenue and Funding, and Governance and Administration.

## Project Updates

- **Integrated Watershed Management** – Kevin Trimble reported that the CRT is looking to attract more community members but noted that the smaller group of engaged people has been effective at moving ideas forward, including the need to educate the public, create public will, and expand the outreach to watershed municipalities. The CRT is developing a roadmap for how to move IWM forward. Some members of the CRT have been discussing next steps with DMM and have acknowledged that we don't have the time to create an in-depth document, but rather will outline priorities for what to do next in the process in conjunction with DMM staff. The CRT will coordinate with DMM staff when they go to District Council for ongoing resources to move IWM forward. The CRT would like more help to brainstorm and develop high level priorities. Kevin noted that IWM is found in all three MWC goals in the strategic plan (communications, policy, and collecting data and gaining knowledge).
- **2023 Muskoka Watershed Report Card** – Peter Sale reported that the Report Card Sub-committee met earlier in the week and that the analysis of indicators and the background report are slowly coming together. The next meeting will be held in early June. Peter is still hopeful that the Report Card will be ready by the end of June, as planned. Chapters have been drafted on Climate Change, Interior Forest, Species at Risk, Ecological Integrity and Invasive Species, and are currently being reviewed by the Report Card Sub-committee. Peter noted that some aspects of our environment are very good, but others are slowly declining and negatively impacting watershed health. The way we are managing our environment now is not going to address the issues (i.e. we can't keep doing the same things and expecting different results).
- **Algae Monitoring Program** – Peter Sale reported that the annual report for 2022 is available on the MWC website at <https://www.muskokawatershed.org/wp-content/uploads/AlgaeMonitoringProgram-2022Report-May2023.pdf>. Peter noted that the data collected to date is not showing any obvious patterns that might predict the occurrence of an algal bloom. A training workshop is scheduled for participants of the program on Friday, June 16<sup>th</sup> from 3-4:30 pm in Bracebridge. New lake associations are currently invited to sign up for the program. Peter noted that a paper from scientists at the Dorset Environmental Science Centre that came out earlier this year shows that the occurrence of algal blooms is increasing across the country.
- **Communications** – Neil Hutchinson reported that speakers have been recruited for all scheduled articles to appear in the Muskokan this summer. The first article was released last week in The Muskokan newspaper and new articles will be released weekly. The articles are also available in the MWC website.

## Partner Updates

- **Lake of Bays** – Councillor Mike Peppard noted that lake associations are starting to ask more questions about the environment and the health of their lake, which is a positive trend.
- **Town of Gravenhurst** – Peter Johnston reported that he has joined the Ontario [Climate Caucus](#) in his role as a Gravenhurst councillor and the topic for the upcoming meeting is "Help Communities Lead." A presentation at District Council on Monday from the new Executive Director of the Muskoka Tourism and Marketing Agency highlighted a new "Step Lightly" initiative to encourage tourists and visitors to step lightly.

- **Gull and Silver Lakes Association** – Neil Hutchinson reported that the association is holding a salt summit on June 3<sup>rd</sup>.

#### **New Business**

- None.

#### **Next MWC Meeting**

MWC's next meeting is scheduled for Friday, June 23<sup>rd</sup> and will take place in Gravenhurst at the Muskoka Discovery Centre. It will include a Volunteer Appreciation Luncheon.

#### **Adjournment**

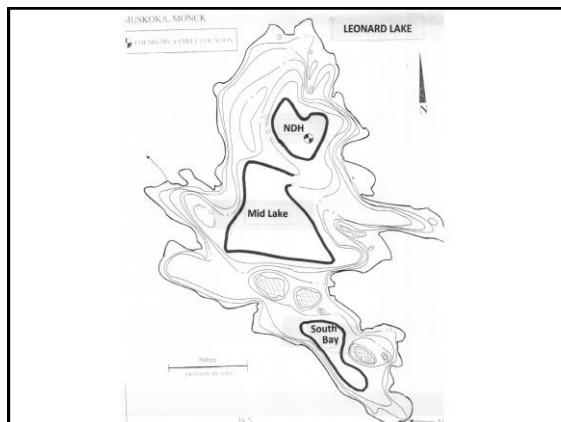
Peter Sale adjourned the meeting at 2:50 pm.

## Understanding Algae Blooms

A brief description of how additional testing at Leonard Lake has provided valuable information about Algae Blooms

Esther Giesbrecht, Water Quality Team, LLSA May 2023

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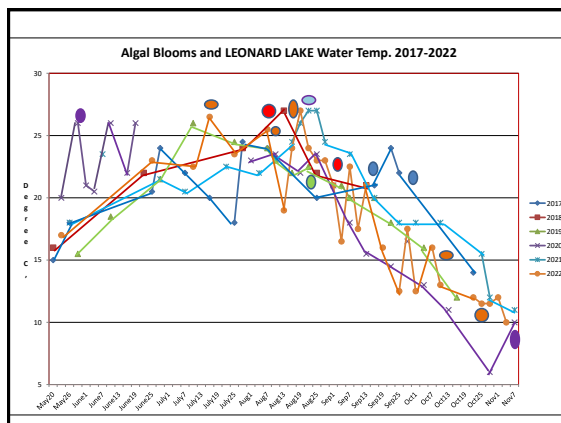


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## Water Monitoring

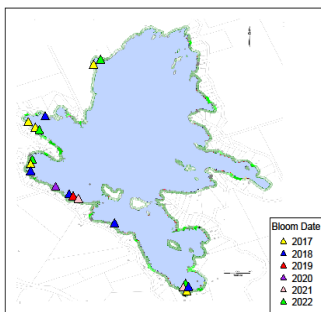
- **Long term: Local and Provincial agencies**
  - Total phosphorus below 10 ug/L
  - Some years, anoxia at North site in late summer.
- **2017: Dr Sue Watson – In depth study**
  - Diverse algal community
  - Low to moderate biomass growth
  - Increased Total Iron and Total Phosphorus near the sediment in the South Bay.
  - CB blooms in late summer.
- **2017-2021** – Small CB blooms each year, late Summer - Fall

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## Bloom Sites, 2017-2022



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## Questions

- Why do the CB blooms occur only on the south western shore? Why wouldn't "changes in climate" affect the entire lake equally?
- Why do they recur at the same sites?
- Are there extra nutrients at these sites?
- Why is it always the same type of CB?
- Where are they coming from?
- Is anything facilitating these blooms?

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### A closer look at the Deep Sites

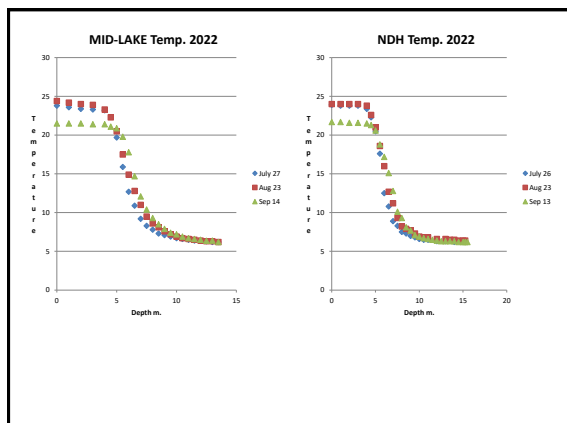
- Rented a Sonde with multiple sensors; capable of transmitting data every metre or half metre right down to the sediment.
- Used it to evaluate all 3 deep sites, on 3 different occasions: July 26, Aug 23, Sep 13.
- Used a Van Dorn sampler to obtain discrete water samples at specific depths: 1m, B- 1m, 6-7 m depth identified by sensors as a possible Deep Chlorophyll Maxima (where algae may be found).

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### Sonde data

- Thermal stratification at all deep sites.
- Variation in Dissolved Oxygen levels.
- Eventual anoxia at all deep sites.
- Internal loading of both Ferrous iron and Dissolved Phosphorus.
- *Dolichospermum lemmermannii*
- A benthic species of CB identified.

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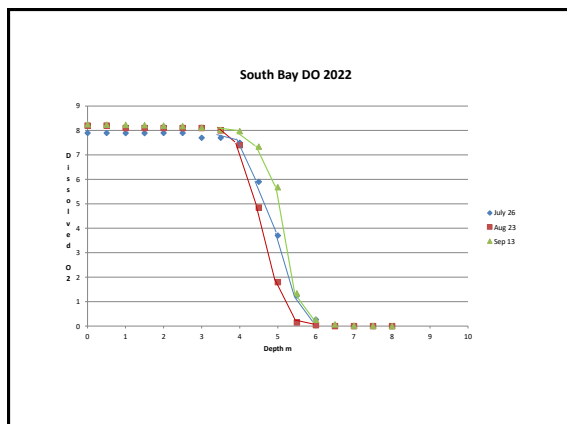


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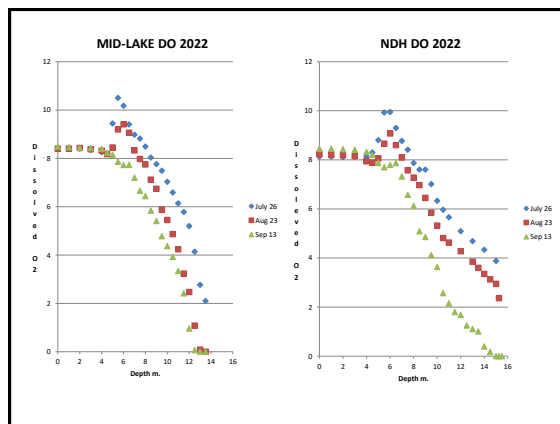
### What is the status of Dissolved Oxygen (DO) at the 3 Deep Sites in Leonard Lake?

- South Bay: Anoxia from 2 metres above the sediment, already evident in July.
- Mid Lake: Anoxia starting in August, and worse in September.
- NDH: Anoxia starting in September.
- Low Oxygen levels and lack of Oxygen status, varies between the deep sites, and also varies with the time of year. It appears to be most pronounced in the South Bay where it is established early in the season; it can be found in Mid Lake in August, and at the NDH in mid September.

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### What are the Implications of Anoxia ?

- Dead Zone for Fish, Zooplankton and most Phytoplankton.
- Decaying organic material, bacteria, and viruses.
- Internal Loading: Release of nutrients from the sediment under “low oxygen conditions”. Nutrients such as Iron (ferrous) and phosphorus will be in a “bioavailable form” – more accessible to cyanobacteria.

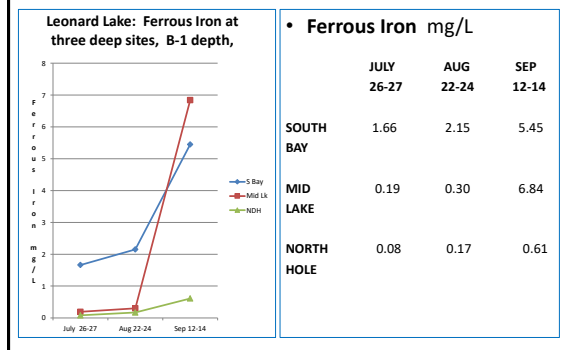
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### Evidence for Internal Loading at Anoxic Sites

- Elevated Levels of Reduced Iron (Ferrous) at the sediment at all 3 deep sites, with levels rising throughout the Summer into the Fall, in parallel with an increase in the level of anoxia.
- Rising levels of Total Phosphorus as well as Dissolved Phosphorus at the sediment at all 3 deep sites, especially in Fall.

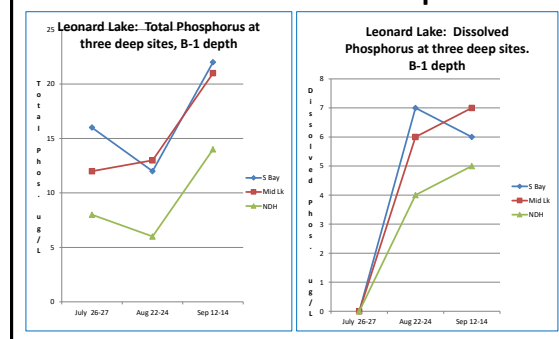
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### Evidence of Internal Loading



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### Total and Dissolved Phosphorus near the Sediment at three Deep sites



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### The Link Between the Availability of Reduced Iron and CB Blooms

- The importance of dissolved, bioavailable iron for the growth and bloom formation of Cyanobacteria in oligotrophic lakes has been noted by several scientists.
- Mollot et al. .... and others have reported that CB blooms in the Fall occur a few weeks after internal loading of iron. Release of ferrous iron appears to precede and facilitate bloom events.
- In 2022, we note that a spike in ferrous iron at the sediment at all 3 deep sites in mid Sep. is followed by more persistent CB blooms in Oct –Nov.
- The seemingly fortified CB are able to produce blooms even in late Fall when the water temperature is low – between 10-15 C.

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### How Does Internal Loading Aid Cyanobacteria?

- Species able to regulate their buoyancy by using gas vesicles, can access nutrients in the hypolimnion, just above the sediment, then move higher to more optimal levels in the water column.
- These newly fortified cyanobacteria are then able to replicate and form blooms in much less favourable conditions.

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### The Link between a Deep Site and the Shoreline Blooms

- Taxonomy: South Bay B-1 depth, Sep 13, 2022
  - 98% of the CB biomass is filamentous, of which:
    - 70% is *Dolichospermum lemmermannii*
    - 7% is *Planktolyngbya*
    - 21% is a benthic cyanophyte (*Cyanothece aeruginosa*)
    - (pico cells not counted)
- Taxonomy : Other sites DCM (7m)
  - Cyanobacteria predominantly *Dolichospermum planktonica* and *Planktolyngbya sp.*

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### Two likely Sources of *Dolichospermum lemmermannii* blooms

- Reactivation of akinetes (spores) deposited in the sediment from previous blooms.
- Cyanobacteria which have been fortified with bioavailable iron and phosphorus released at the anoxic sediment in South Bay.
- Role of wind and water currents?

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### Every Lake: Unique and Complex

- Phosphorus levels in some areas of the lake are NOT reflective of a single mid-lake location.
- Differences between different areas of the lake.
  - Between shoreline areas and deep sites
  - Between Summer and Fall
  - Between different depths at deep sites.
- Discrete samples as well as composite samples.
- Broader range of analytes.
- Consider a broad range of testing, and multiple solutions to a complex problem.

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### Why is the West side of the lake more vulnerable to CB blooms?

- Topography/Bathymetric features?
- Wind, water currents?
- What a map shows: shallower lots, high density, road closer to the water.
- Run-off bringing more Total Phosphorus from human activities?
- A combination of factors?

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### Protecting Water Quality

- Policies should be based on evidence.
- Reduce phosphorus from run-off, septic systems.
  - Shoreline vegetative buffer
  - Ensure shoreline is uninviting to Canada Geese
  - Avoid shoreline erosion
- Keep toxic substances (salt) out of the lake.
- Support policies that place a threshold for development on vulnerable lakes.
- Use specific mitigation measures where appropriate.

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## OUR LAKE is a limited Resource.

Use Responsibly,  
and Wisely

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# MWC – Mission

Past 20 years: **To champion watershed health**

Going forward:

**To empower the community to protect and enhance watershed health**

How? Our Strategic Plan defines the actions to accomplish these 3 goals:

**1 - Communications, Stewardship and Awareness**

**2 - Policy and Advocacy**

**3 - Enhanced Watershed-Wide Knowledge base**

# Goal #1 – Communications, Stewardship and Awareness

## Objective

Increase the level of awareness and engagement of the community on watershed health and stewardship issues

## Strategies

1. Engage public in hands-on stewardship programs
2. Create and disseminate public information through a range of programs media and events
3. Enhance public recognition of MWC “Brand”
4. Take on Role of integrator of an Environmental Alliance, collaborating with other community sectors

## Measure of Success

1. Set measureable targets for:
  - Level of community awareness of environmental issues
  - Community participation in stewardship programs
  - Attendance at Summits and Conferences
  - Media articles published
  - Hits on social media

## Tactics

1. Annual funding applications for and delivery of stewardship programs:
  - Love your Lake
  - Natural Edge
  - Citizen Science for Algae “**Muskoka Green Watch**”. (like; “collect your ash”, “sample water for salt analysis”)
  - Stewardship Recognition Awards
2. Organize/deliver, as per quarterly communication plans:
  - MWC Report Card on 5-year intervals
  - Bi-annual Environmental Summits and Stewardship Conferences
  - Quarterly Public seminars and lectures. summer markets
  - Bi-weekly media articles on current topics
  - Material & presentations for schools
  - All products posted on MWC web site, twitter etc.
3. As part of items 1 &2, create and promote eye-catching material that educates and promotes MWC Logo and Brand. Highlight what MWC does that others do not.
4. Organize discussions with various community sectors examining common ground and complementary goals and resources. These to include:
  - FMW, CAM, & other like-minded ENGOs, towards an Environmental Alliance
  - Business sectors via Chambers of Commerce

# Goal #2 – Policy & Advocacy

## Objective

Planning decisions are based on

- a) Current science as expressed in MWC position papers, and
- b) Integrated Watershed Management for the Muskoka River Watershed as a whole. Emphasize the cross municipal boundaries nature of watershed impacts.

## Strategies

1. Develop a Watershed Plan that sets out how all sectors contribute, using IWM as a process, maintaining and enhancing watershed health.
2. Advocate for district and municipal governments to adopt and implement recommendations of MWC Position/Advocacy Papers relating to watershed health.
3. Enhance engagement and collaboration with district and municipal governments

## Measure of Success

1. Set meaningful & measureable targets for:
  - Sectors actively engaged in CRT
  - CRT reports
  - Impact of MWC recommendations on Ops
  - Interactions with municipal councils and staff

## Tactics – (Performance metrics, owners, timeline)

1. Continue to engage the community via the Community Round Table, as an MWC sub-committee, tasked to:
  - Establish a common vision and goals for all sectors with respect to the health of the watershed, economy and community
  - Create a “roadmap” for bringing IWM, as a way of thinking and managing, to the Muskoka Watershed
  - Engage Chambers of Commerce as links to the broader watershed business community
  - Develop a document (or series of) that clearly describes how the whole watershed works as an ecosystem
  - Develop the Watershed Plan, in cooperation with district and municipal governments, and containing recommendations for action. Include a “how to” guide.
2. Undertake MWC review and comment on all municipal and district OP’s. Enable “green” development in building codes, ecotourism and infrastructure.
3. Establish annual delegations to all councils within the watershed (go beyond the 6 lower tier municipalities)
  - Establish working relationships with CAOs, planning depts., individual councilors.
  - One on one chats with potential key influencers<sup>3</sup>

# Goal #3 – Enhanced Watershed-Wide Knowledge Base

## Objective

Knowledge (science-based & traditional) of the Muskoka River Watershed as an ecosystem is adequate to support policies and action that effectively protect and enhance watershed health

## Strategies

1. Create new and updated MWC Position/Advocacy Papers
2. Collaborate with other organizations on research to expand the size, scope and quality of the knowledge base for the watershed.
3. Engage indigenous community to learn from and include 100's of year of experience on ecosystem stewardship

## Measure of Success

Set meaningful and measureable targets for:

- New, updated position/advocacy papers (+ similar documents)
- Knowledge gaps which have been resolved
- New collaborative programs & results
- Degree of indigenous engagement

## Tactics – (Performance metrics, owners, timeline)

1. Position/Advocacy papers should
  - Express current scientific knowledge in plain language accessible to non-scientists
  - Place scientific knowledge in the context of the interconnected parts of the whole Muskoka River Watershed ecosystem
  - Make better use of data to identify trends of concern
  - Identify potential actions that address identified problems
  - Research the gaps and needs for new Policy papers
2. Collaborative efforts to include:
  - Expand the MWC algae program, in collaboration with FMW
  - Work with DESC and universities on research that is beyond the capacity of MWC.
3. Seek indigenous representatives for all major MWC programs and identify the indigenous knowledge component of resulting reports and papers.