

COASTAL OCEAN RESEARCH INSTITUTE

OCEANWATCH

Howe Sound | Atl'ka7tsem

WORKSHOP | JUNE 7, 2019

Action Planning for Climate Change in
Howe Sound's Marine Environment

Summary Report

HELD AT
Ocean Wise | Vancouver Aquarium

REPORT PREPARED BY
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Executive Summary

The Ocean Watch: Howe Sound/Atl'ka7tsem action planning for climate change workshop had the overarching goal of identifying and prioritizing actions to mitigate climate change impacts in Howe Sound/Atl'ka7tsem's marine environment. Held in the beautiful Steller's Gallery at the Vancouver Aquarium, part of the Ocean Wise Conservation Association, on the unceded territory of Squamish, Tsleil-Waututh, and Musqueam Nations, the workshop brought together just over 50 knowledge holders from a diversity of backgrounds.

The first half of the morning was spent listening to short presentations that highlighted a few of the actions taken within Howe Sound/Atl'ka7tsem. Some of these were the direct result of the Ocean Watch: Howe Sound (2017) report, while others were initiatives already in place that increased their momentum with the release of the report.

The second half of the morning involved three presentations with a climate change focus. Attendees were shown damage within Howe Sound/Atl'ka7tsem from severe winter storms, followed by a presentation highlighting potential climate change projections for the Metro Vancouver area, rounded off by a presentation on sea level rise (SLR) and how communities can address SLR at the local government level.

The afternoon was given to break out discussion groups focusing on the key question of the day: What actions can be taken to mitigate the impacts of climate change in the Howe Sound/Atl'ka7tsem marine environment? Ideas were gathered, grouped into themes, and attendees voted to help prioritize these actions. The top five actions (in order) were:

1. Protect and restore key habitat
2. Education/engagement
3. Enforcement
4. Legislation
5. Ecosystems based approach.

It is important to have a sense of ownership in creating attainable actions to mitigate the impacts of climate change. There is a high level of motivation within the Howe Sound/Atl'ka7tsem community, with a strong willingness and desire to create more awareness and engage people at all levels in protecting this unique region in the face of climate change.

We would like to thank all of the workshop participants who shared their knowledge, as well as to those who expressed an interest but were unable to attend. Thank you to Lasse Gustavsson who opened the workshop, and Joyce Williams for her words of welcome. An additional thanks to everyone who contributed by carrying out tasks on the day, whether small or large, to help make this workshop a success.

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Workshop photos: Kyla Hemmelgarn

Workshop Context

Howe Sound/Atl'ka7tsem is a unique fjord dotted with islands surrounded by the sparkling waters of the North Pacific Ocean. The waters in the Sound provide habitat for numerous coastal and marine species, including rare species such as glass sponge reefs, lingcod, and rockfish. Located adjacent to a major urban centre, Vancouver, it is highly accessible for outdoor enthusiasts, development opportunities, business, and industry. It also boasts a rapidly growing population, which can stress natural habitats and ecosystems. Despite its rural appeal and ease of access, Howe Sound is experiencing the effects of climate change.

Recent climate change effects felt within the Sound include storms and wave surges throughout the winter 2018/19, which wrought havoc on marinas, jetties, boats, and other low-lying coastal structures. Debris, including Styrofoam, were strewn throughout the Sound and washed up along the coastline. Shoreline erosion is a concern to many living in the Sound, especially in waterfront properties. During the last few summers, wildfire smoke has settled in the Sound for days at a time. In late June 2019, a wildfire broke out in Lions Bay. The risk of wildfires is exacerbated by minimal precipitation and high winds.

This workshop was held to bring together key knowledge holders representing local First Nations, stakeholders, governments, and local organizations, to learn more about potential impacts of climate change within Howe Sound, and to brainstorm on ways to mitigate these impacts by identifying actions that individuals through to government level can take (See Appendix 1, Agenda). The most pertinent of these actions were captured and will be included in the next Ocean Watch: Howe Sound report update.



Workshop Theme

Action planning for climate change in the Howe Sound/ Atl'ka7tsem marine environment.

Purpose and Goal

This workshop was held with four key purposes in mind:

- To share actions taken from the Ocean Watch: Howe Sound Edition (2017) ;
- To share and increase knowledge about climate change impacts in Howe Sound/ Atl'ka7tsem;
- To identify and prioritize actions related to climate change in the Sound; and
- To enable relationship building between participants.

The overarching goal of the day was to focus on identifying and prioritizing actions to mitigate climate change impacts in Howe Sound/Atl'ka7tsem's marine environment.



Workshop Summary

Held in the beautiful Steller's Gallery at the Vancouver Aquarium, part of the Ocean Wise Conservation Association, the workshop involved just over 50 attendees, including representatives from Squamish Nation, members of local governments, provincial and federal organizations, non-governmental organizations, non-profits, and business.

The day began with a welcome from Ocean Wise Conservation Association's new CEO, Lasse Gustavsson. This was followed by an acknowledgement that the workshop was held on the unceded territories of Squamish, Tseil-Waututh, and Musqueam Nations, and an overview and outline of the agenda for the day from Aroha Miller, Ocean Watch Manager.

A little later in the morning, Squamish Nation Councillor Joyce Williams addressed the attendees, and gave a short welcome. Joyce thanked everyone for being there and expressed her gratitude for the wonderful work being done.

The rest of the morning was broken into two sessions. The first involved a recap of actions taken within Howe Sound since the release of the Ocean Watch: Howe Sound Edition (2017). The second session involved three presentations highlighting and bringing climate change into focus.

The afternoon was dedicated to break out groups. Groups brainstormed actions to mitigate the impacts of climate change in the Howe Sound marine environment. Ideas were grouped into related themes. Attendees then voted on the actions, allowing them to be prioritized based on interest and/or importance. This was followed by an open room discussion/question and answer session. Aroha Miller made a short presentation on layout/format of the upcoming Ocean Watch: Howe Sound/ Atl'ka7tsem report update, and asked for feedback on what attendees might like to see more or less of.

The day closed with Aroha Miller summing up key points, and thanking everybody for attending.

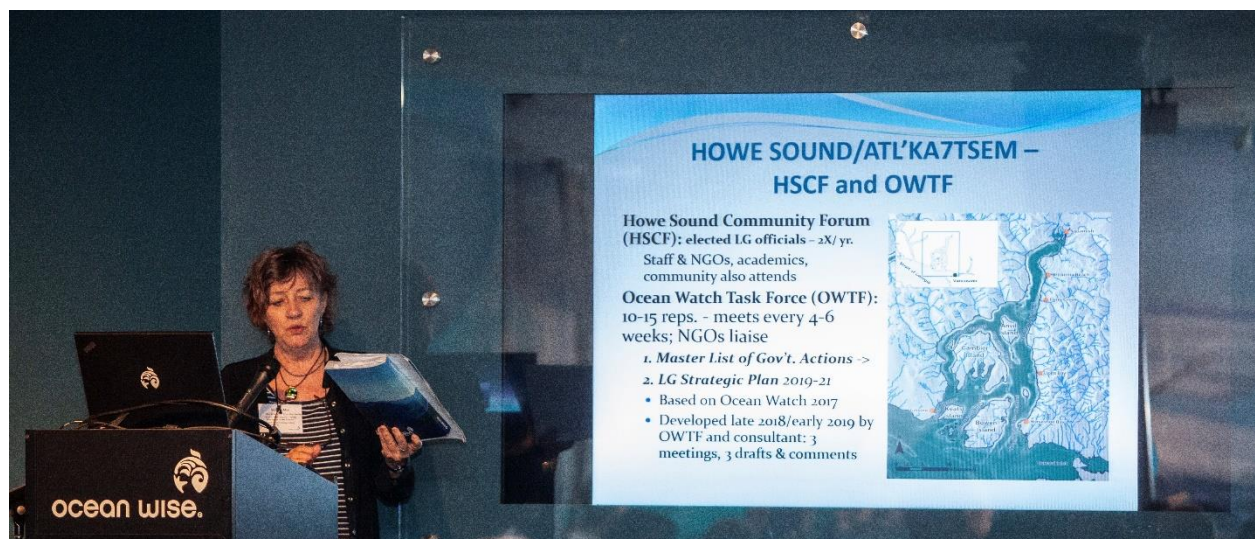


The following section includes notes summarizing the two morning sessions (7 presentations in total). Key slides from presentations can be found in Appendix 2. Key themes, ideas, and actions suggested to mitigate climate change in Howe Sound's marine environment are summarized, as is feedback on the next Ocean Watch: Howe Sound/Atl'ka7tsem report. These notes are summaries only, and endeavour to capture the overall thoughts shared on the day.

1. Morning Session One – Recap of actions taken within Howe Sound

Brief update on OWHS actions taken (Susan Abs)

Susan Abs of Eclipse Consulting presented a brief update on actions taken since the release of the Ocean Watch: Howe Sound (2017) report, including refreshing attendees on the formation of the Ocean Watch Task Force to advance relevant actions proposed in the 2017 report, and highlighting some key achievements, such as the Marine Reference Guide and the formation of glass sponge reef marine refuges. Susan developed a strategic plan for moving forward with achieving actions that were recommended in the Ocean Watch: Howe Sound (2017) report. Within this strategic plan, climate change is Strategy 5 and is a cross-cutting theme for Strategies 1, 2, 3, and 6. Copies of the strategic plan will shortly be available by early fall from aroah.miller@ocean.wise.org and/or via the Ocean Watch website.



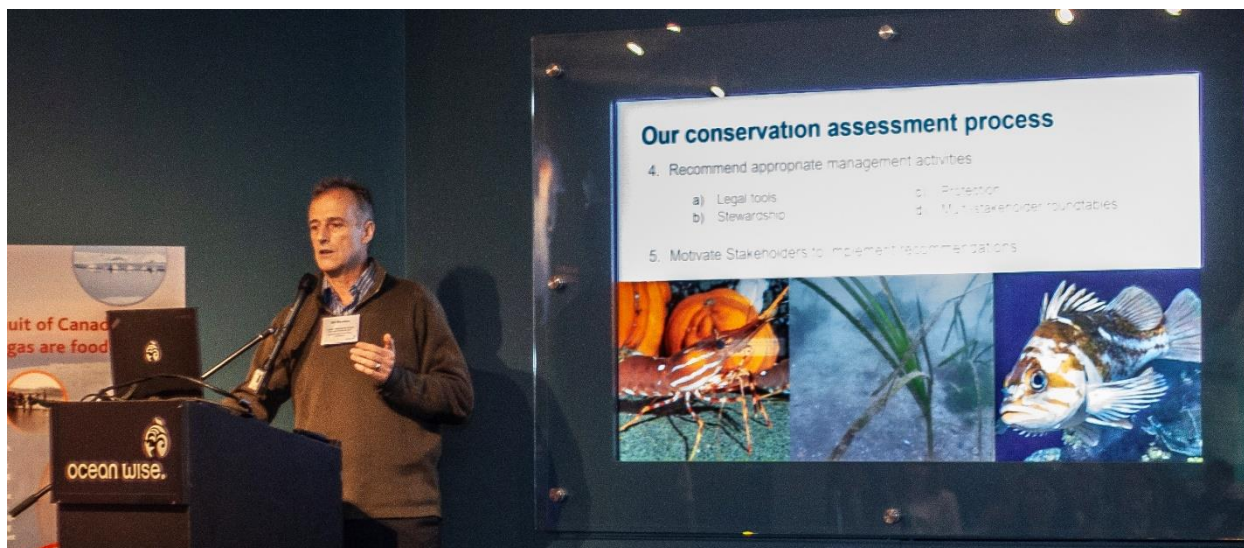
Progress towards Howe Sound classification as a UNESCO biosphere region (Ruth Simons)

Ruth Simons, Executive Director for the Future of Howe Sound Society and Lead of the Howe Sound Biosphere Region Initiative (HSBRI), presented on the progress that has been made towards having Howe Sound/Atl'ka7tsem designated as a UNESCO biosphere region. HSBRI is a registered society made up of volunteers, with six board members and a working group, who meet as needed. HSBRI have been invited to submit an application. The group has contributed to a nomination document consisting of 200 pages with 17 chapters. The process involves answering questions about research, monitoring, management of the area, and bringing forward information available about the region. The group is seeking to be the nineteenth biosphere region in Canada.



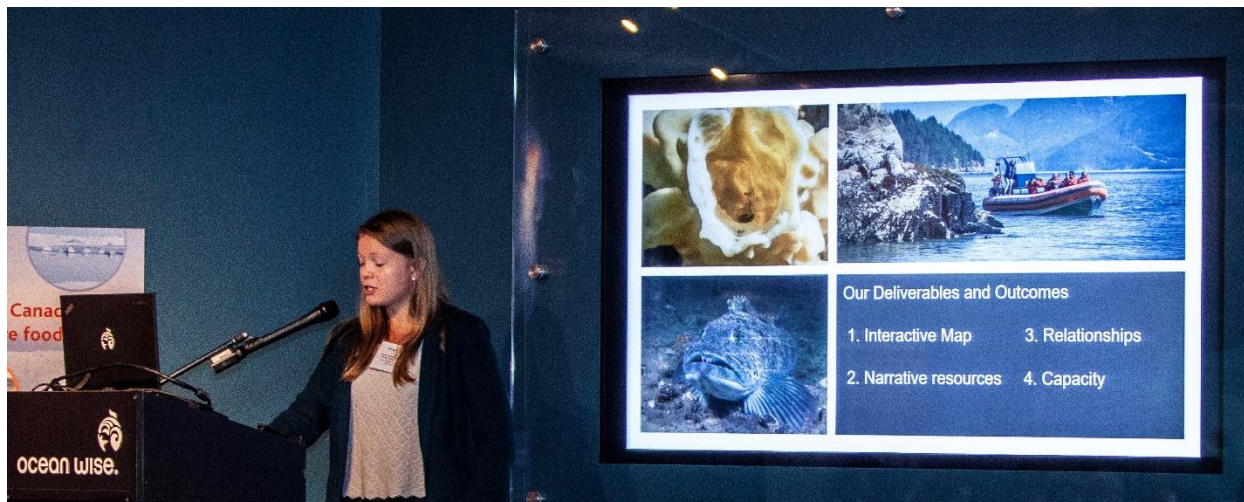
Atl'ka7tsem/Howe Sound Marine Conservation Assessment (Bill Wareham, David Suzuki Foundation [DSF])

Bill Wareham of DSF presented on the Atl'ka7tsem/Howe Sound marine conservation assessment (MCA), a joint achievement between DSF and the Coastal Ocean Research Institute (CORI). The goals of the MCA are 1) to define a path for improving/maintaining the ecological health of the Howe Sound/Atl'ka7tsem marine environment; and 2) to define the high value conservation areas in the Sound and where conservation opportunities are. The website is designed as a tool to be used by people working on various projects in Howe Sound/Atl'ka7tsem. It consists of multiple layers of data, including operational layers (base map, biophysical, boundaries, cultural, ecology, analysis, and human use). The MCA is being used as an education and advocacy tool to push for the protection of conservation areas.



Marine Reference Guide (Bridget John, Tides Canada)

Bridget John, Research Assistant at Tides Canada presented a brief update on the marine reference guide (MRG). The goal is to build capacity to restore, protect, and be stewards of the Sound. The MRG framework is an online interactive map that displays spatial data associated with Howe Sound/Atl'ka7sem's marine environment and watershed, including biophysical, cultural, ecological, human use, socioeconomic, industrial, recreational, and long-term ecological modelling data layers. This will enable data layers to be overlapped to understand spatial multi-use in the marine environment and to reduce conflicts between user groups in the Sound. The MRG is broader than the MCA in terms of community engagement. Next steps are to create narratives of different areas of the Sound, providing the resources, best practices, and recommended uses for the marine environment to protect significant ecological, industry, recreational, and sociocultural values.



2. Morning Session Two – Climate change

Damage caused by extreme weather events in Howe Sound (Ruth Simons)

Ruth Simons gave an overview of four serious storm events that occurred in Howe Sound/Atl'ka7tsem during the 2018/19 winter period based on photographs of damage that occurred. This provided an opportunity to see some of the consequences of extreme weather events in Howe Sound/Atl'ka7tsem. Some examples included five boats sinking in Darrell Bay on December 15th 2018. Because some of these were live-aboard boats, RCMP, Coast Guard, and Search and Rescue were involved. A fuel spill was a part of this wreckage, as well as assorted garbage from the boats. Volunteers removed paints, oil, fuel, containers, and other hazardous chemicals from the beach, not all associated with these five boats. In Passage Island, gangways, decks, and docks were damaged and garbage washed ashore. On December 18th 2018 in Fishermen's Cove, a boat sank and a fire started when a gas line was cut. West Vancouver Fire Department, Search and Rescue, and Coast Guard attended. Many more examples were given, and all had very high economic and physical costs associated with them. Styrofoam was a big issue as it is a key material used in jetty/dock construction, and rapidly breaks down into small pieces that are difficult to recover. Volunteers collected 100 bags of Styrofoam from Bowen Island alone after one of these storms.

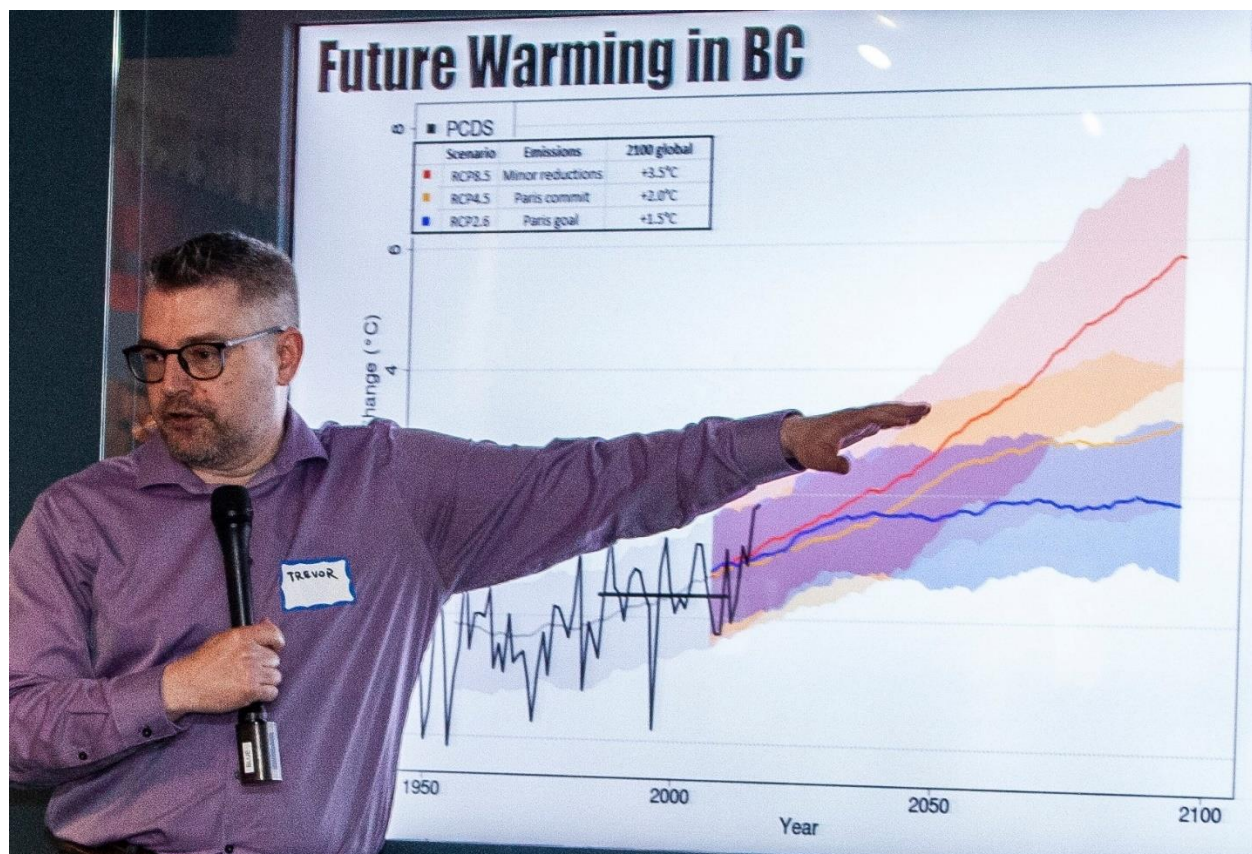


Damage and sunken boats in front of the Lions Bay marina, February 4th 2019.

What's climate got to do with it? (Trevor Murdock, Pacific Climate Impacts Consortium - PCIC)

Trevor Murdock touched on major predicted climate changes for the wider Metro Vancouver region, and interpreted how these might impact Howe Sound/At'l'ka7tsem. Throughout the presentation, Poll Everywhere was used to gather participant feedback, displayed on screen.

Projected changes include increases in extreme rain events but an overall decrease in precipitation; less snow pack (warmer winters); warmer temperatures/heat waves (hotter, drier summers) and associated public health risks; and longer growing seasons. Predicted sea level rise (SLR) in the coastal BC area is 1 metre; however there is much uncertainty around these predictions. We will experience storm surges before we really notice SLR. A graph showing three different predicted climate projections based on greenhouse gas emissions was presented – worst case scenario (business as usual); some reduction in greenhouse gas emissions; and best case scenario. Currently, most countries signed onto the Paris Climate Agreement are not on track to meet their commitments, heading us for the middle scenario. In the worst case scenario, the coolest days we will experience in the future will be hotter than our current hottest days.



Sea level rise and policy action at the local level (Deborah Carlson, WCEL)

Deborah Carlson spoke to how local communities and governments are the front line dealing with climate change impacts. In BC, provincial SLR guidance for local governments was finalized in January 2018. The natural sea boundary will shift significantly over time and we have not planned accordingly. The US National Academy of Sciences recently indicated we should be thinking about 2 metres SLR by 2100. An important consideration is the hardness of the shoreline with respect to coastal squeeze. Without a hardened shoreline, shoreline habitat will naturally migrate. However, with a hardened shoreline, the existing coastal habitat and intertidal area will be inundated and lost. The most important thing is to get started and take action. At a local government level, this could mean forming a committee or working group to bring together all of the different responsibilities touched by climate change e.g., infrastructure, planning, sustainability, emergency management, finance.

Deborah then outlined various ways that local government can regulate the coastline, such as Official Community Plans; zoning; development permit areas; and upland regulation affecting shorelines. There was information presented about what is meant by “at the shoreline” with regards to private and public coastal land ownership, and what exactly is meant by coastal protection. We need to govern with the community and engagement needs to be values based.



3. Break-out Groups: Actions for Climate Change

In the afternoon, facilitator Heather Lehman guided attendees through some brainstorming exercises. This involved breaking out into small groups to discuss possible actions that could be taken to mitigate the impacts of climate change in the Howe Sound marine environment. A question arose as to whether we were talking about “mitigation” or “adaptation”. It was decided to leave this open to interpretation. Participants were reminded of the seven themes from the Ocean Watch: Howe Sound (2017) report: seafood, species and habitats; clean water; sense of place and wellbeing; coastal development and livelihoods; stewardship and governance; oceanography and climate change. However, ideas did not have to be associated with these. Small table facilitators recorded ideas.



Groups were very engaged and numerous ideas were posited. Because of the overlap between many of these ideas, small table facilitators were asked to group ideas into themes. The following themes emerged:

- Infrastructure i.e., better dock construction
- Education/engagement
- Protect and restore key habitats
- Legislation: improve communication and process between governments
- Incentives (monetary)
- Plan for change: identify best practices for mitigation; recreation demand management
- Big picture thinking: expanded regional growth strategy

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- A photograph showing two individuals, a woman on the left and a man on the right, both wearing pink shirts, working on a large whiteboard. The woman is pointing at a diagram on the left side of the board, while the man is writing on the right side. The whiteboard is covered with various notes, diagrams, and sticky notes. On the left, there is a diagram of a coastline with labels like 'Howe Sound' and 'Hastings Park'. In the center, there are several bullet points and a list of tasks. On the right, there are more bullet points and a list of tasks. The background is a plain wall.



After the facilitators grouped ideas into themes, workshop participants were asked to vote on the themes to help prioritize the actions identified. Each person was given three sticky dots to place next to the three themes they saw as being the most important. The top five themes arising were (in order):

1. Protect and restore key habitat
2. Education/engagement
3. Enforcement
4. Legislation
5. Ecosystems based approach



Participants then regrouped for a collective discussion on this exercise. Participants were asked for their observations about the themes arising. Feedback ranged from the need to take a big picture approach, to being able to recognize that we care about this area and topic. Subsequently, it was asked what new ideas were now percolating for people as a result of the conversation. Answers included an increase in motivation, creating more awareness, and engaging people, amongst other answers. Discussion then moved to what obstacles there were to addressing or working on some of the suggested actions. Cost, shifting priorities of governments, and fear of change were all mentioned as obstacles. A full summary of questions and answers captured from this discussion can be found in Appendix 3.

4. Feedback for the next Ocean Watch: Howe Sound report

Aroha Miller gave a brief presentation reminding participants of the layout from the 2017 Howe Sound report. She identified new articles that she hopes can be included, as well as an appendix for methods, to increase transparency of where data for each article came from. For each article, both new and updates for previous articles, a new sub-heading will be added, where appropriate: “Potential impacts of climate change”. There is the intention to link to appropriate map layers from the Marine Conservation Assessment (DSF/CORI initiative) for the online version, but in the interest of keeping the print version shorter, these maps will largely not appear in the hard copy, as earlier feedback suggested a shorter hard copy would be appreciated. Further work is needed to increase transparency for the rating legend used in the previous report, and this will likely involve forming a small committee who will together assign the ratings. The current action plan is available online only; for the next edition, the action plan should appear in print also.

Participants were invited to provide feedback on what they did/did not like about the previous report, to further develop the next edition. Feedback included great graphics, approachable language, actionable items, a lot of citizen science and local knowledge incorporated, easy to navigate website, the summaries allow one to drill down on a specific topic of interest, and the inclusion of First Nations stories or relevance in each section. There was some confusion in the use of the Ocean Health Index and rankings in the last report. Some actions from the last report were aspirational but not actionable. Industry needed to be spoken for – they were missing from the table (NB: industry representatives were invited to this workshop).

Conclusion

The workshop was concluded by Aroha Miller thanking everyone for attending, and reflecting on the knowledge that was generously shared during the day. Actions taken since the release of the 2017 report were revisited, highlighting the significant progress being made within the community. Participants listened attentively to presentations about projected impacts of climate change and sea level rise within the Howe Sound/Atl’ka7tsem/greater Metro Vancouver region, and then contributed unreservedly to discussions, brainstorming, and asking questions around this topic. Numerous ideas and actions were proposed, and a voting exercise helped to prioritize actions. The purpose and goal of the workshop were met, with plenty of

opportunities for participants to mingle and build relationships that could lead to future collaborative work to further the protection of the Howe Sound/Atl'ka7tsem marine environment.

Many thanks for everyone who helped make this day a success, from the small table facilitators and our lead facilitator, to everyone who gave of their time, effort, energy, and continuing support of Ocean Watch and Ocean Wise.

A follow up survey was circulated to participants, and results of this can be seen in Appendix 4.



Agenda

Howe Sound Ocean Watch Workshop

June 7th 2019, Vancouver Aquarium

Purpose:

- Share actions taken at organization/local government level arising from the Ocean Watch: Howe Sound 2017 report
- Share knowledge about climate change and potential impacts in Howe Sound
- Identify and prioritize actions related to climate change in the Howe Sound marine environment
- Enable relationship building between participants

Goals:

Identify and prioritize actions to mitigate climate change impacts in the marine environment of Howe Sound

8:30 - 9:00 Arrival

- Coffee and refreshments provided

9:00 - 9:25 Welcome and Introductions

- Welcome from Coast Salish First Nation (Squamish Nation)
- Welcome from Ocean Wise (Lasse Gustavsson, CEO Ocean Wise)
- Overview of the day (Aroha Miller)

9:25 - 10:25 Actions Taken

- Brief update on OWHS actions taken (Susan Abs)
- Progress towards Howe Sound classification as a UNESCO biosphere region (Ruth Simons)
- Atl'ka7tsem/Howe Sound Marine Conservation Assessment (Bill Wareham, DSF)
- Marine Reference Guide (Bridget John)
- Howe Sound edition 2 update (Aroha Miller)

10:30 – 10:50 break, coffee

10:50 – 12:00 Climate Change

- Damage caused by extreme weather events in Howe Sound (Ruth Simons)
- What's climate got to do with it? (Trevor Murdock, PCIC)
- Sea level rise and policy action at the local level (Deborah Carlson, WCEL)

12:00 – 1:00 LUNCH

1:00 – 1:10 ~~Peter Ross~~ CORI research in support of action Cancelled

1:10 – 2:00 **Round table discussion – climate change**
What actions can be taken to mitigate the impacts of climate change in the Howe Sound marine environment?

2:00 – 2:20 Coffee break

2:20 – 2:40 **Voting**
Prioritize actions identified

2:40 – 3:15 **Collective discussion**
1) suggested actions into themes, 2) obstacles, 3) action priorities.

3:15 – 3:20 **Reminder of the current layout ideas for Howe Sound update** (Aroha Miller)

3:20 – 3:45 **Break-out groups**
Brainstorming on report layout


3:45 - 4:00 **Summary and next steps; thank you and concluding remarks**

Appendix 2 Selection of slides from presentations



Susan Abs: Update on Ocean Watch Howe Sound actions taken

OWHS 1st Edition: ACTION THEMES

- 1. ACKNOWLEDGE & BUILD ON FIRST NATIONS HISTORIC STEWARDSHIP OF HOWE SOUND/ATL'KA7TSEM**
- 2. CREATE A MARINE REFERENCE GUIDE FOR HOWE SOUND**
- 3. PROTECT AND RESTORE PRIORITY MARINE SPECIES, HABITATS AND FUNCTIONS**
Marine Protected Areas, Plankton, Forage Fish, Sea Stars, Salmon, Lingcod, Rockfish, Bald Eagles, Marine Birds, Cetaceans, Eelgrass, Glass Sponge Reefs, Fish and Seafood Harvesting
- 4. TRACK THE STATUS AND TRENDS FOR KEY OCEAN HEALTH INDICATORS**
- 5. COLLABORATE ON MARINE AND COASTAL PLANNING AND MANAGEMENT**
 - 5.1 Monitoring and Enforcement of Legislation
 - 5.2 Comprehensive Marine and Land Use Planning
 - 5.3 Local Government Protection of Marine and Coastal Ecosystems
 - 5.4 Clean Water (and Industrial Pollution)
 - 5.5 Maritime Industry and Large Vessel Traffic
 - 5.6 Problem Vessels
 - 5.7 Tourism And Recreation
 - 5.8 Climate Change Mitigation And Adaptation
 - 5.8.1 Temperature Rise
 - 5.8.2 Sea Level Rise, Stream Flow And Flood Risk
- 6. STRENGTHEN EDUCATION and STEWARDSHIP PROGRAMS**
 - 6.1 Public Education On Coastal Ecosystem Health
 - 6.2 Citizen Science and Stewardship
 - 6.2 Environmental Learning (Education)



UPDATE/PROGRESS



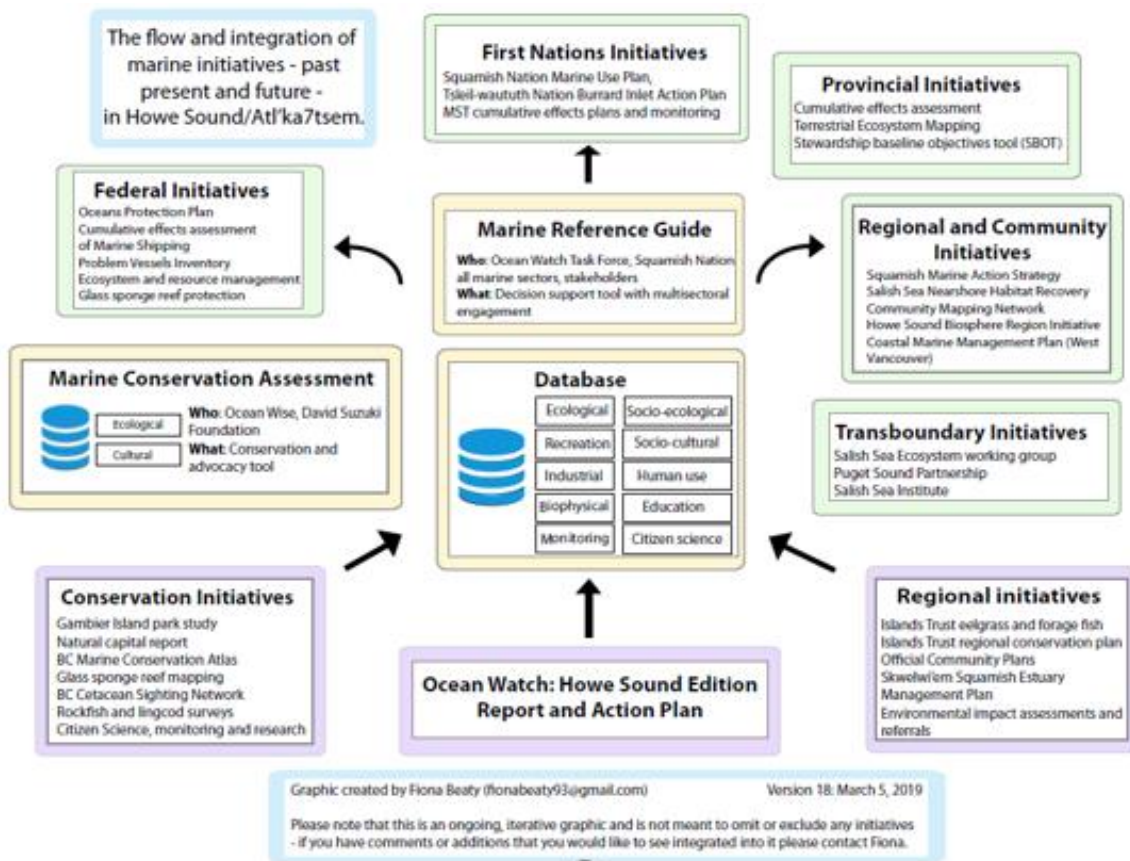
1. Acknowledge & build on First Nations historic stewardship of Howe Sound/Atl'ka7tsem
2. Create a Marine Reference Guide (MRG) for Howe Sound
3. Protect and restore priority marine species, habitats and functions
4. Track the status and trends for key ocean health indicators
5. Collaborate on marine and coastal planning and management
6. Strengthen education and stewardship programs

1. Done at HSCF meetings; in MRG & OWTF Local Gov't. *Strategic Plan*
- 1, 5. First Nations involvement in all OWHS initiatives (below)
2. *MRG - key strategy addressing multiple data & management actions
- 3, 4, 5, 6. MPAs: sponge reef Conservation Areas; spp. strategies; MRG → protection & mgmt.; OWTF *LG Strategic Plan*
- 1, 2, 3, 5, 6. OWTF *LG Strategic Plan*
6. On-going/expanding NGO, env. educators' and gov't. programs
- 1 – 6. UNESCO Biosphere designation



Our Deliverables and Outcomes

1. Interactive Map
2. Narrative resources
3. Relationships
4. Capacity





Fisherman's Cove Gas Dock – December 20th, 2018

- Boat tied up sank and recovered
- Fire started when gas line was being cut – West Van Fire Department, SAR, Coast Guard on site.
- Some of the float replaced, Styrofoam remaining in old docks

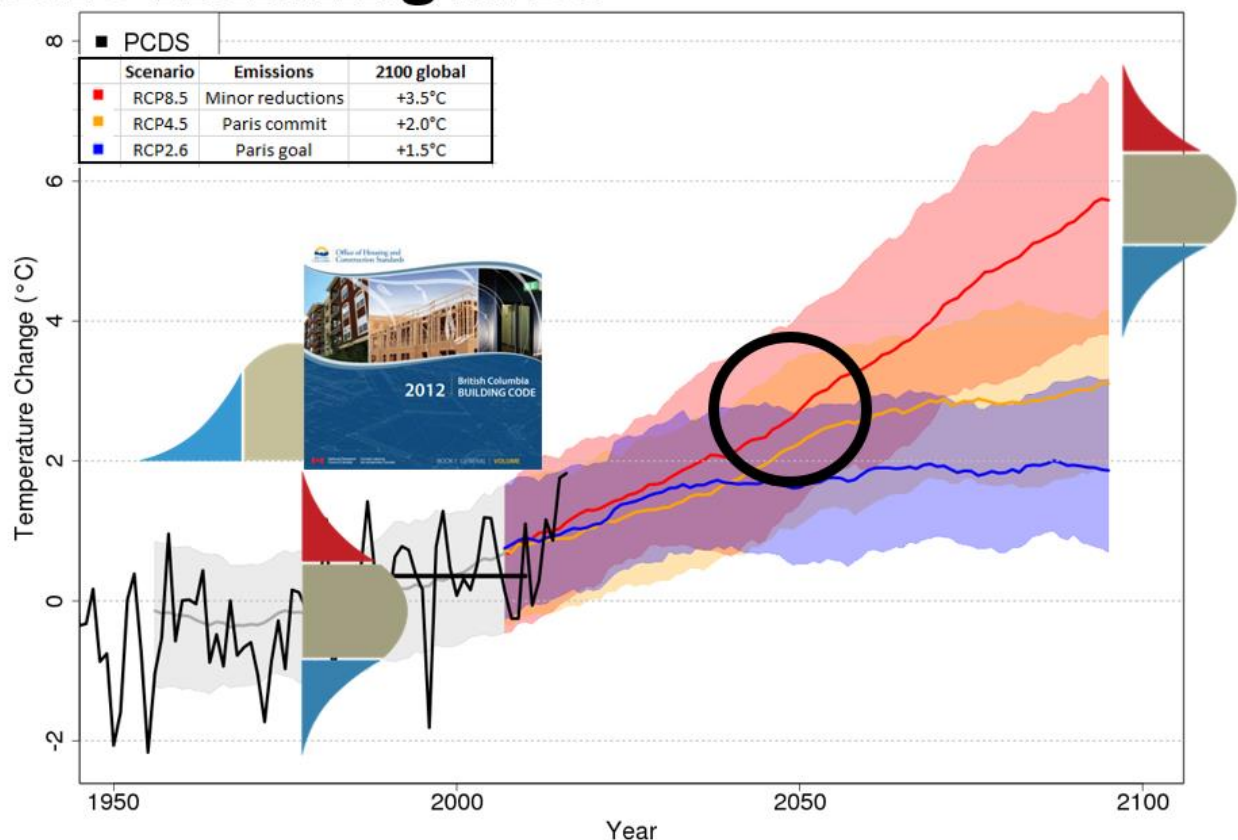


Trevor Murdock: What's climate got to do with it?

In ONE (1) word or phrase, what was a remarkable weather event or climate impact in the past 3 or 4 years?

drought
forest
king
flood
fires
storms
tides
wildfires
smoke
wildfire
windstorm
windstorms
snowpack
tornado
waves
storm surge
downpours
heat

Future Warming in BC

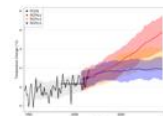


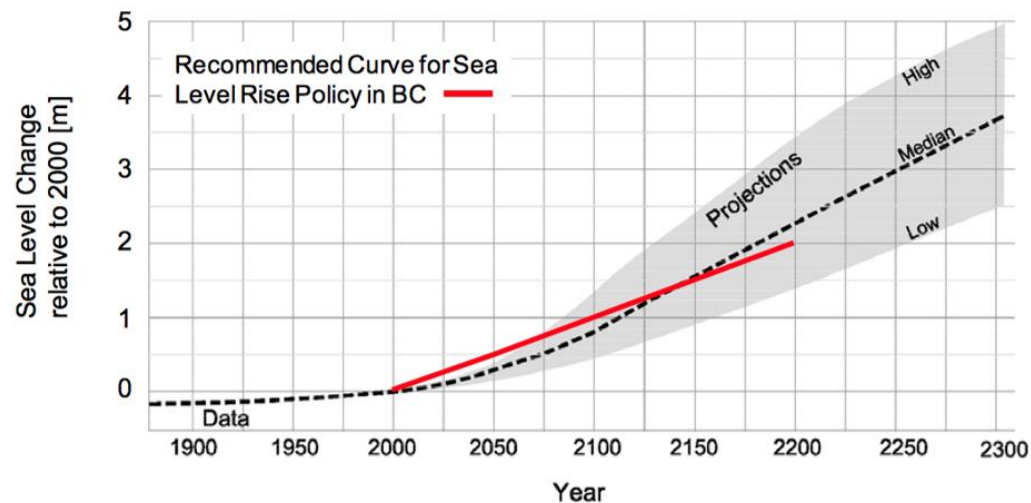
Share one (1) word to describe how you're feeling right now

concerned
motivated
challenged
empowered
shocked
pick-up-sword
daunted
sad
stunned
water shortage
deflated
scared
educated
sunburnt

Best Practices

- Make use of available climate information
- Consider a range of future projections
- Practice cross-disciplinary engagement
- Iteration, iteration, iteration





Provincial sea level rise guidance for **local governments**
(2011- draft; January 2018 – finalized)

How local governments can regulate on the coast

- * Official community plans
- * Zoning
- * Development permit areas
- * Upland regulation affecting shorelines



OCP policies

- * Opportunity to describe shoreline objectives, in context of longer term planning
 - * Protection/remediation priorities
 - * Public access
 - * Identify studies needed
 - * **Resilience** (erosion, sea level rise)
- * Example: “To support climate resilience in shoreline areas, opportunities to protect and restore coastal ecosystems that can buffer waterfront areas from rising sea levels and storm surge should be considered in development and redevelopment applications.”



Zoning



- * Requirements apply everywhere within a zone, no need for permitting
- * Setbacks – apply to structures, but don't protect vegetation in the setbacks
- * Reminder: can define uses out to municipal water boundary

Appendix 3 Summary of questions and answers from afternoon discussion

With regards to the exercise and themes identified in the small group discussions, what are your observations?

- With protection and to restore key habitats, you need to take big picture approach. There are challenges if one is not taking a big picture view.
- The way I'm viewing this, these are all just different stages in the process; even the themes with fewer votes are really important. Difficult to prioritize.
- Some of the themes could be combined further.
- When we think about infrastructure, how to build, how to carry out transportation around watersheds, what is missing is that we are trying to mitigate in the marine environment what we are doing on land. In watersheds, we are seeing the results of activities that increase carbon emissions. The ocean is the final result of much of this.
- Climate change is an opportunity to engage people with nature. Climate change is nature change. If nature is changing, how does nature work? There is an engagement possibility. We have to think more like nature. In the educational engagement piece, see this as an opportunity in gloomy times. There is a pro-activeness about what is going on right now. There is an opportunity here from an educational point of view.
- If we are trying to connect with nature we look to those best connected with nature; there is much to be learned from how First Nations conduct themselves with respect to the land.
- There is a merging opportunity to converge climate change with biodiversity conservation. Recent climate change reports are about climate change and biodiversity loss. There is an opportunity in Howe Sound: all of this conservation and biodiversity work helps to mitigate climate change and adapt to it.
- It is important to recognize we care about this; we need to be able to translate this to the general public.

What new ideas are percolating for you as a result of this conversation?

- Motivation is becoming highlighted in the sense that a lot has been accomplished with Howe Sound; it motivates me to help with education and awareness in general.
- Create more awareness: e.g., posters for "5-minute beach clean-ups"; have garbage bags that can be used to clean up (making the path easy, simple for people to help).
- Small projects can have profound outcomes if you involve people in your successes. Build confidence engaging people in doing something differently, and they will be more willing to invest in the future.
- One of the great assets of Howe Sound is hope. We love Howe Sound because Howe Sound is a good news story. We are in the oceans business; we love these stories because they energize people. Energy comes out of knowledge and people going forward. Our greatest asset right now: we are in recovery mode. It buoys peoples' interest in participating. It is an opportunity now; to that extent the strength of the Howe Sound community becomes an asset in taking advantage of that. The human

community is scattered; it is meetings such as this that bring the community together, to build and enhance the community. Anything that builds community and strengthens community allows us to leverage what we have right now. We have a good news story and are drawing talent to us.

- There was a document that was part of the roundtables in late 1990s. Sarah was with Tsleil-Waututh and wrote the document “Vision 2020”. It tells the story of where peoples’ heads were at in late nineties, the very beginnings of talking of Howe Sound as a collective, as a regional vision. We hope to hold, through the Biosphere Initiative, a Vision 2030 or 2040; where are we at on that document? Where do we want to go?

Obstacles to addressing or working on some of these action areas?

- Cost – it is hard to get people to spend money on climate change when the effects are in the future. Increases in home insurance premiums included climate change effects.
- Regarding cost, keep in mind federal money being thrown at sexy problems. There has to be political pressure to pay for enforcement. Providing the push to really invest in all the original mandate, not new sexy problems. Investing in enforcement.
- Shifting priorities of new governments that come in, and new people at the table sets you back.
- Despair; a lot of people are giving up. It is hopeless; need to recognize the obstacle. We have to think about addressing some of the myths and giving some of the good news specifically about Howe Sound.
- In marine environment, not to target but watch for this behavior: “it is only my dog/boat.” I am first and the collective is down the priority list. It is cumulative effects of behavior. The value of “my wants come first” is counterproductive. We have to counteract the behavior that comes from that very self-centered point of view.
- Fear of change; any change in lifestyle, values. It is hard to get people to change their mind.
- Engaging beyond the conservation community. How to take this information and engage the larger community, a broader group of stakeholders.
- We seem to be looking at this as though populations will remain static. Population growth will increase in the future in Howe Sound.
- If we don’t start making the transition to a carbon free economy now, we will continue to make the problem worse. We need to address the issue that is causing the problem. Need to talk about solutions, and how to get to the zero carbon economy, but we need the political will to achieve a zero carbon economy.

Appendix 4 Follow-up Survey

A follow-up survey was circulated amongst workshop attendees to ensure everyone had the opportunity to give feedback on the workshop and that their ideas were captured. There were a total of 13 respondents from 51 attendees.

All respondents found the workshop to be useful. Specifically, the climate change lectures and discussions, making new connections/networking, and hearing about updates on actions being taken throughout the sound were noted as the most useful outcomes of the workshop. One respondent found the voting activity to be of little use.

This survey gave respondents another opportunity to ensure their ideas on actions to mitigate climate change in Howe Sound were heard. The majority who responded to this question (7 of 12 answered this question) said they had no further ideas or suggestions, and felt their ideas had been accurately captured at the workshop. The other respondents provided various suggestions, including: a greater focus on increasing wildlife corridors and addressing wildfire threats; increasing DFO support for non-profit work; obtaining updated plankton data from the sound; an increase in governance and lobbying for action on commitments already made by local governments; and a cumulative effects framework to identify gaps in knowledge, encompass monitoring and management, with weight placed on climate change.

A final multi-part question posed in this survey was with regards to what respondents liked best/least about the previous Ocean Watch: Howe Sound report (2017), and whether they had any suggestions for making the next update more relevant. Graphics from the first report were very popular, as was the clear, short format of the articles, the wide variety of topics covered, and the collaboration that occurred to bring this work together. Not so popular was the cost of hard copies, a lack of clarity on the aims and objectives of the report, and the lack of pinniped information. More information about First Nations/Squamish Nation historical and current use of the area was called for (written by the Nation), as was a shorter report with a clear purpose, and an increase in the number of First Nation and local government reviewers of articles submitted. A suggestion was made to include a glossary of key terms used throughout the next report update, information on new glass sponge reef protections, and to include more about climate change.

Feedback gathered together with the thoughts, suggestions, and ideas provided through the workshop, will be taken into consideration when working on the next Ocean Watch: Howe Sound Edition update.

