Knowledge Mobilization
Moving Scientific Knowledge into Pacific Salmon Fisheries Management

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Ocean Tracking Network – Travel fund

The *Pacific Salmon Commission*

All interviewed participants - from DFO, user-groups and other stakeholders, members of the media

**Logistical support:** Samantha Wilson, Graham Raby, Andrew Rous, Matthew Casselman. UBC forestry department
• Need to bridge the gap between science and action (science-policy)

• Call to natural scientists: “Conservation is primarily not about biology but about people and the choices they make.” - Richard Cowling, 2005

• Look to social sciences to understand how natural science (scientific knowledge) can better inform policy makers
• There are barriers to the uptake of new knowledge

• Research shown that knowledge does not travel well

• Not clear why some knowledge/research has greater/broader impact than others
Complexity of Knowledge Movement

User A

User B

User C

User D

User E
General Research Objective

- Explore the intersection of knowledge, politics and decision-making in Pacific salmon fisheries management in Canada
  - Based on Knowledge Mobilization (KMb) Theory
Case-study: Fraser River Salmon Fisheries

- Fraser is one of the world's most significant salmon rivers
- Commercial, recreational and First Nation fishing
- **Complex mgmt**: co-migration of species/stocks - bycatch
Complexity of Stakeholders

Fraser River Salmon Case-study

Recreational Fishers
Commercial Fishers
First Nation Fishers
Fish Processors
NGOs
Ocean Tracking Network

- Global network (lead by Canada, Dalhousie)
- Deploys state of the art **acoustic receivers** and **oceanographic monitoring** equipment in all of the world’s five oceans
- **Global receiver infrastructure**
  - Collect data on sea animals in relation to ocean’s changing physical properties
• $ millions invested into research
• **Ocean Tracking Network** (UBC and Carleton) leading Pacific Salmon telemetry studies for 10+ years
• Fisheries interactions, warming rivers, disease, juvenile migration, etc.
Specific Research Objective

• Explore challenges of mobilizing new scientific knowledge in the management of Fraser River salmon fisheries. Look at:

  a. Knowledge channels and network
  b. Perception of knowledge, science, and knowledge user community
• **Qualitative research:** Semi-structured interviews (Feb-April 2014)

• **Sample Frame:** participants from groups involved in use, mgmt, activities and debate surrounding Fraser River salmon

• **Sample size:**
  – 28 “management” level participants
    • 21 DFO staff
    • 7 Pacific Salmon Commission (PSC) staff
  – 23 “stakeholder” participants
    • NGOs, fishery reps, media, consultant, Fist Nation reps, etc.

• Preliminary findings
Knowledge moves via ‘channels’

- Conversations
- Conferences
- Publications
- Media
- Grape vine
- Etc.
Q: When looking for scientific information where do you turn to first?

Knowledge is most often mobilized through an individual’s “social network” or “internally”

“I go to my co-workers to ask what’s out there. I don’t actually have many personal contacts with too many research scientists” – DFO staff

“I don’t like to rely on the internet, summaries or abstracts. I rely on my peer group, the people at PSC. People I have worked with” – PSC staff

“Colleagues within DFO, Science branch and Stock assessment biologists within DFO” – most of DFO staff
Q: When looking for scientific information where do you turn to first?

Peer-reviewed publications made up approx. 1/5 of the responses:

– Concerning as it is the primary dissemination tool for scientists

“The challenge with journal articles is to find applicable ones” – PSC staff

“I don’t have much time to look at primary literature… when I do, it is usually through a forward” – DFO mgmt
Stakeholder access to knowledge

- Google, personal contacts, press releases, and government agencies
- **Challenges to use and access science:**
  - **TIME** (to filter and search) and **FUNDS** (to access)

“…not sure what to ask when searching for science. **Papers are not clear**, so when I read through it, it’s not what I needed. **My network is my biggest resource** of knowledge. **Abstracts are all I look at because we need money to access full articles**” – NGO VP
Q: How often do you seek out scientific information relevant to your work from the following sources?

Findings: Knowledge Channels and Network

Social media
- Never
- Rarely
- Sometimes
- Very often

Listservs
- Never
- Rarely
- Sometimes
- Very often

Individual websites
- Never
- Rarely
- Sometimes
- Very often

Organization websites
- Never
- Rarely
- Sometimes
- Very often

Government Websites
- Never
- Rarely
- Sometimes
- Very often

Personal contacts
- Never
- Rarely
- Sometimes
- Very often

Public interest reports
- Never
- Rarely
- Sometimes
- Very often

Science publications
- Never
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News/Media
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- Sometimes
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Response Frequency (%) for Management:
- Never
- Rarely
- Sometimes
- Very often
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Findings: Knowledge Channels and Network

Stakeholder usage of scientific information sources

Sources of Scientific Information:
- Social media
- Listservs
- Individual websites
- Organization websites
- Government Websites
- Personal contacts
- Public interest reports
- Science publications
- News/Media

Response Frequency (%) From Stakeholders:
- Never
- Rarely
- Sometimes
- Very often
Stakeholder usage of scientific information sources

- **Social media**: 20% Never, 40% Rarely, 40% Sometimes, 10% Very often
- **Listservs**: 20% Never, 40% Rarely, 40% Sometimes, 10% Very often
- **Individual websites**: 20% Never, 40% Rarely, 40% Sometimes, 10% Very often
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Response Frequency (%) From Stakeholders:
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- Rarely
- Sometimes
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Take Home: Importance of social network

- Knowledge universe for management and stakeholders are much different than academics
  - Peer review publications are secondary

- Social network is the primary source and channel of knowledge

- Need to know people, to network, to build trust, etc.
Perspective of “Reliable” Information

- Very broad view of reliable information
  - Expertise
    - Experience, TEK, first hand obs
  - Broad knowledge base
    (collection of knowledge)
  - Trustworthy
  - Scientific rigor
    - Peer review, academic approach, replicability
  - Objectivity
    - No agenda/interest/motive, unbiased, funding source
Take-home: Objectivity is not assumed

- Objectivity is assumed in the academic world

- For management and stakeholders – demand proof of objectivity prior to considering knowledge

“University science, a lot is done by students and it’s not always reliable…concerned about **credibility of organization** ….as they are **funded by industry** rather than government funded by public money” - NGO rep
Take-home: Knowledge evaluated on breadth and collection

- Academia - scientific papers evaluated methods, analyses etc. NOT “broad knowledge”

- Stakeholders and management see “broad knowledge” as evidence of depth and/or commitment
  - Source of trust
  - Sign of competence
Q: What are barriers to incorporating new scientific findings into actual fisheries management practices?

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<th>Stakeholders</th>
<th>Management</th>
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| • Resistance to change  
  • Human nature, status quo, lack of political will  
• Politics  
  • Fed govt, politicized science  
• Resources  
  • Lack of funding, human capacity  
• Bureaucracy  
• Trust issues | • Relevance and applicability  
• Resources  
  • Lack of time, funds, capacity  
• Institutional structure, bureaucracy  
• Research lag time  
• Communication gaps  
• Resistance to change  
• Transparency and trust  
• Buy-in, lack of compelling evidence |
“Sometimes peer review is not enough… the application of a finding can’t be generalized” – DFO mgmt

“Decisions are based not just on scientific information, but also other contextual information available” – DFO mgmt
Q: **What advice** would you give academic fisheries scientists about their research?

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<th>Stakeholder</th>
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<td>• Better <strong>communication</strong> to public, use <strong>laymen</strong> terms</td>
<td>• <strong>Applicability/relevance:</strong> Work with mgmt to design study, follow ups</td>
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<td>• <strong>Collaborate</strong></td>
<td>• <strong>Transparency</strong>, be honest about uncertainties and limits</td>
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<td>• More <strong>applied science</strong></td>
<td>• <strong>Transferability:</strong> generalize, quantify research</td>
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<td>• Separate science from politics</td>
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**Findings:** Advice to fisheries scientists
Words from the management perspective

“We need more people who can integrate. Certain individuals can act as a conduit between groups”

“Speak loud and make sure you can popularize it somehow. Unless they [fisheries scientists] can get the attention of the people who like hockey and texting better, they will be buried”
Words from the management perspective

“Communication. What are the weaknesses or gaps in that field? As opposed to pre-made project that are harder to fit in [management framework]”

“It’s a process of collaboration and understanding what the department needs… Application to more areas, species and issues”
Words from the stakeholders’ perspective

“Ask so what? Always bring back the science and make connection into advancing policy and implementation” – NGO rep

“Do more of it. Make a compelling case for it. Work with others to build a compelling case” – Env. consultant
Network, collaborate, and engage

- **Collaborate and network with experts (trusted source)**
  - Scientists need to work alongside management to increase relevance and applicability
  - **Build trust** within the social network

- **Publishing is not enough** to make societal impact
  - **Social network** biggest knowledge source and channel
  - **Communicate and engage** with stakeholders/public (in their language) – build trust
Knowledge evaluated by social robustness

• “Users” will evaluate scientific work on different criteria than scientific peers
  – Social robustness (broad knowledge base) vs. peer review

• Need institutional change (e.g. university structure) to facilitate KMb, to have management impact
  – Academic career and research rewards based on classic scientific publishing
  – Simply publishing will likely not make impact on conservation
Thank you.

Questions?

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Constraints and demands pushing for new ways to do things – need for change

“….The [stakeholder] groups are more sophisticated now… they know that they have to push their own agenda to maximize their share of the harvest. Managers aren’t just managers any more, people see them more like judges dividing up an estate.” – DFO manager

“The bottom line is we may have to change how assessments are done. Budgets have been cut, so we need to be looking for outside research. The problem is that we’re not accustomed to doing that yet and we don’t really know how to do it, institutionally speaking.” – DFO manager
New knowledge entering fisheries management have to be socially robust

“The science policy and scientific management interface is one of our biggest challenges. Industry, First Nations, and the NGO community all follow what we do very, very closely. They examine all of our decisions based on their scientific merits, which means that no matter what we do we can be criticized from multiple directions.” – DFO manager

“My world has gone from being a pretty simple one based on the [traditional] academic model, towards a model that is more open and transparent ... We have to be in constant dialogue with these groups and constantly justify our decisions.” – DFO manager
Q: How reliable is the information from the following sources about state of Fraser salmon populations? (MGMT)

Findings: Knowledge Properties

- University-based scientists
- Government scientists
- Government fisheries managers
- C/ENGO
- Environmental consulting
- Commercial fishers
- First Nation fishers
- First Nation organizations
- Anglers
- Angler associations
- Recreational river users

Always, Usually, Sometimes, Rarely, Never, Don't know
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