What determines whether or not adaptive management programs affect management and policy decisions?

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ESSA Technologies Ltd., Vancouver B.C.

NCER – Aug 4, 2011 – Baltimore MD
Where our ideas come from

- 2001: workshop on factors which enable / inhibit AM (for U. Washington - *handout*)
- 2006: study of 20 adaptive forest management projects (for NCSSF)
- 1979-2011: Toolbox from various AM projects across North America
Bridging the decision-science circles in AM projects

- Stakeholder interests
- Agency mandate
- Uncertainties
- Evidence
- Models / Tools
- Experimental design
- Decision Makers
- Scientists

- Risks
- Costs and Benefits
The Forest AM Study

<table>
<thead>
<tr>
<th>Potentially Enabling Factors (from UW workshop)</th>
<th>Forest AM Projects (20)</th>
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</thead>
<tbody>
<tr>
<td>Problem Context</td>
<td>“Success” (14)</td>
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<tr>
<td>Leadership</td>
<td>“Failure” (6)</td>
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<tr>
<td>Executive direction</td>
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<tr>
<td>Problem definition</td>
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<td>Communication &amp; Org. Structure</td>
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<td>Community involvement</td>
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<td>Planning</td>
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<td>Funding</td>
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<td>Staff Training</td>
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<td>AM Science</td>
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</table>
Key Factors Enabling AM

Context – Driving Problem

Leadership
Executive Direction
Problem Definition
Communication
Organizational Structure

Community Involvement
Planning
Funding
Staff Training
AM Science

ESSA 2006. NCSSF Study
Steps 1-5 set the foundation for Step 6
Feasibility of AM Experiments

How easy to replicate treatment / controls?

- Farm Plots
- Stream Reaches / Forest Stands
- Watersheds Salmon Pop’ns
- Large River Basins

Global climate change

How many years to test hypotheses?

- Easy
- Difficult
- Impossible

Increasing # of entities & value conflicts, system inertia

40 30 20 10 1

easy
difficult
impossible

How easy to replicate treatment / controls?
5 tools for building bridges

Decision Makers

Scientists
1. Water Use Planning Process

www.bchydro.com

Policy Group
Generate alternative strategies
Review outcomes, tradeoffs
Converge to preferred option

Technical Group
Convert strategies into actions
Simulate actions & outcomes
Summarize tradeoffs
2. Decision Analysis

PrOACT Approach

Problem

Objectives

Alternatives

Consequences

Tradeoffs

Hammond et al. 1999. Smart choices.
3. Data Quality Objectives Process

1. State the problem
2. Identify the decision
3. Identify inputs to the decision
4. Define the study boundaries
5. Develop an “if-then” decision rule
6. Specify limits on decision errors
7. Optimize design for obtaining data

Avoid the Path of Endless Questions
4. Simple Outputs for Managers

<table>
<thead>
<tr>
<th>Performance Measure</th>
<th>Description</th>
<th>Multi-Year Rollup</th>
<th>% Poor</th>
<th>% Fair</th>
<th>% Good</th>
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</thead>
<tbody>
<tr>
<td>Historical flows – No gravel augmentation</td>
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<tr>
<td>CH - Fall</td>
<td></td>
<td>5</td>
<td>39</td>
<td>56</td>
<td></td>
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<tr>
<td>CH - Late Fall</td>
<td></td>
<td>23</td>
<td>32</td>
<td>45</td>
<td></td>
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<tr>
<td>CH - Spring</td>
<td></td>
<td>16</td>
<td>24</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>CH - Winter</td>
<td></td>
<td>12</td>
<td>28</td>
<td>60</td>
<td></td>
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<tr>
<td>ST1</td>
<td></td>
<td>19</td>
<td>40</td>
<td>41</td>
<td></td>
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<tr>
<td>Weighted useable area - spawning</td>
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</table>

| Historical flows – gravel augmentation | | |
| CH - Fall          |                           | 5                 | 32     | 63     |        |
| CH - Late Fall     |                           | 23                | 26     | 51     |        |
| CH - Spring        |                           | 9                 | 21     | 70     |        |
| CH - Winter        |                           | 7                 | 25     | 68     |        |
| ST1                |                           | 7                 | 19     | 74     |        |
| Weighted useable area - spawning | | | | | |
But linked to details for scientists...

Select individual scenario x PM x year results of interest for more detailed outputs.
Within-year details in Excel
## 5. Choose the right tools

<table>
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<tr>
<th>Problem</th>
<th>Tools</th>
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<tbody>
<tr>
<td>Disagree on desired outcomes, objectives.</td>
<td>Conflict resolution through negotiation</td>
</tr>
<tr>
<td>Disagree on how to achieve outcomes.</td>
<td>Science syntheses, research, pilot studies, adaptive management.</td>
</tr>
</tbody>
</table>
And finally…

Change occurs when the consequences of retaining the status quo are worse than the consequences of trying something new.
Thanks!