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Enabling Climate Change Adaptation: Opportunities for Shared Learning

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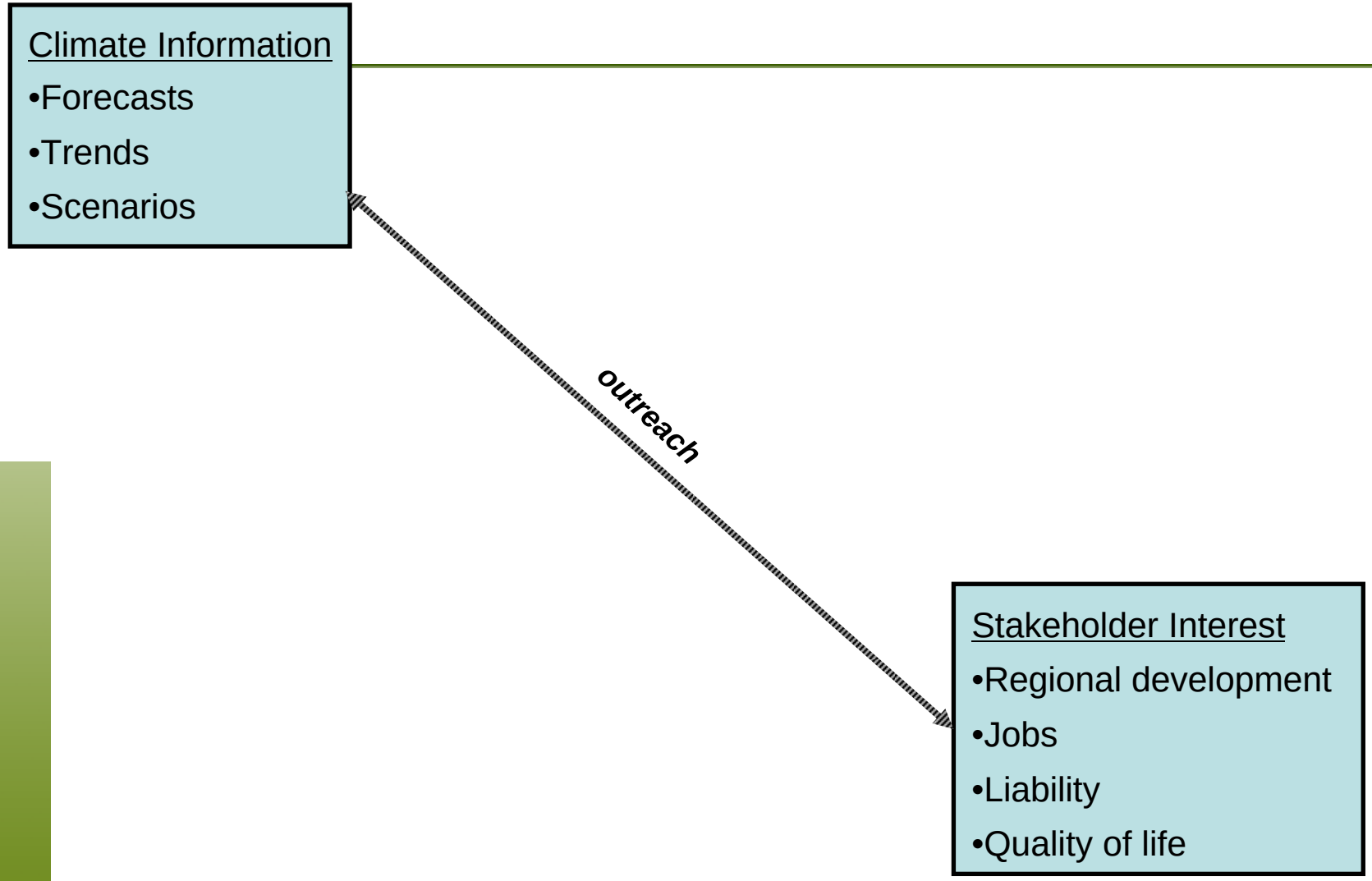
Outline

- **Information flow: seeking an interdisciplinary learning environment on climate change**
- Learning networks; creating shared learning on climate change adaptation
- Case study: Okanagan Basin, Canada

Climate change information flow to stakeholders?



Impacts Modeling/Visualization Helps Explore Futures and Enable Dialogue on Responses

- **It allows us to "fast forward" through time and simulate impacts under different scenarios**
- **We can also explore how actions (or lack) might affect future outcomes – enables dialogue with decision makers!**

2009

Modelling suite

A.K.A.

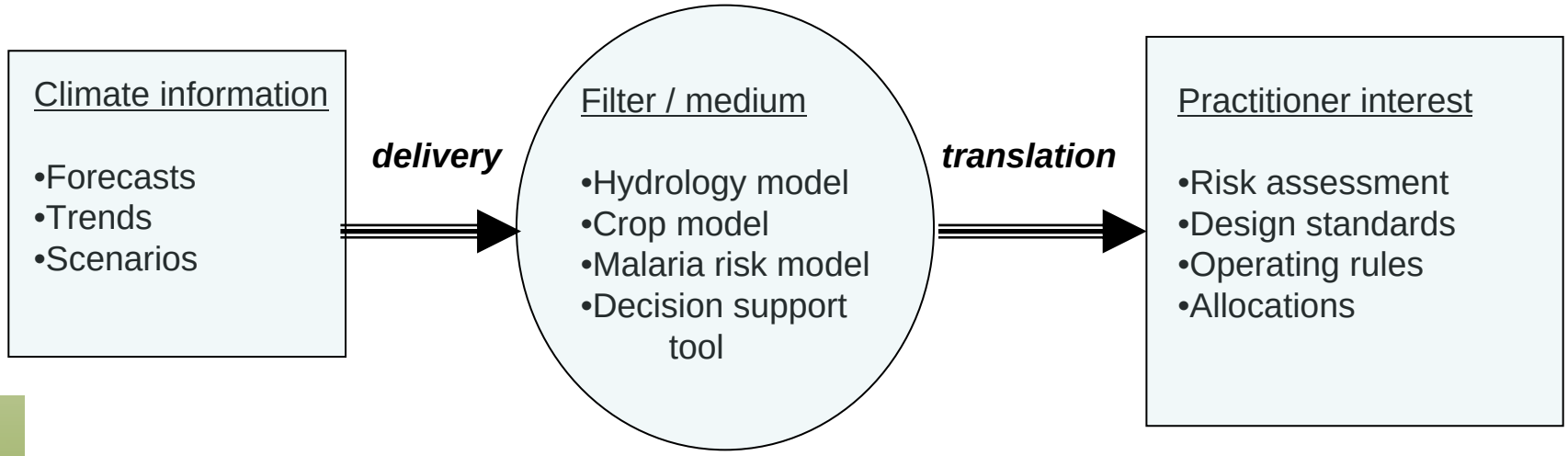
Our "time machine"

2050

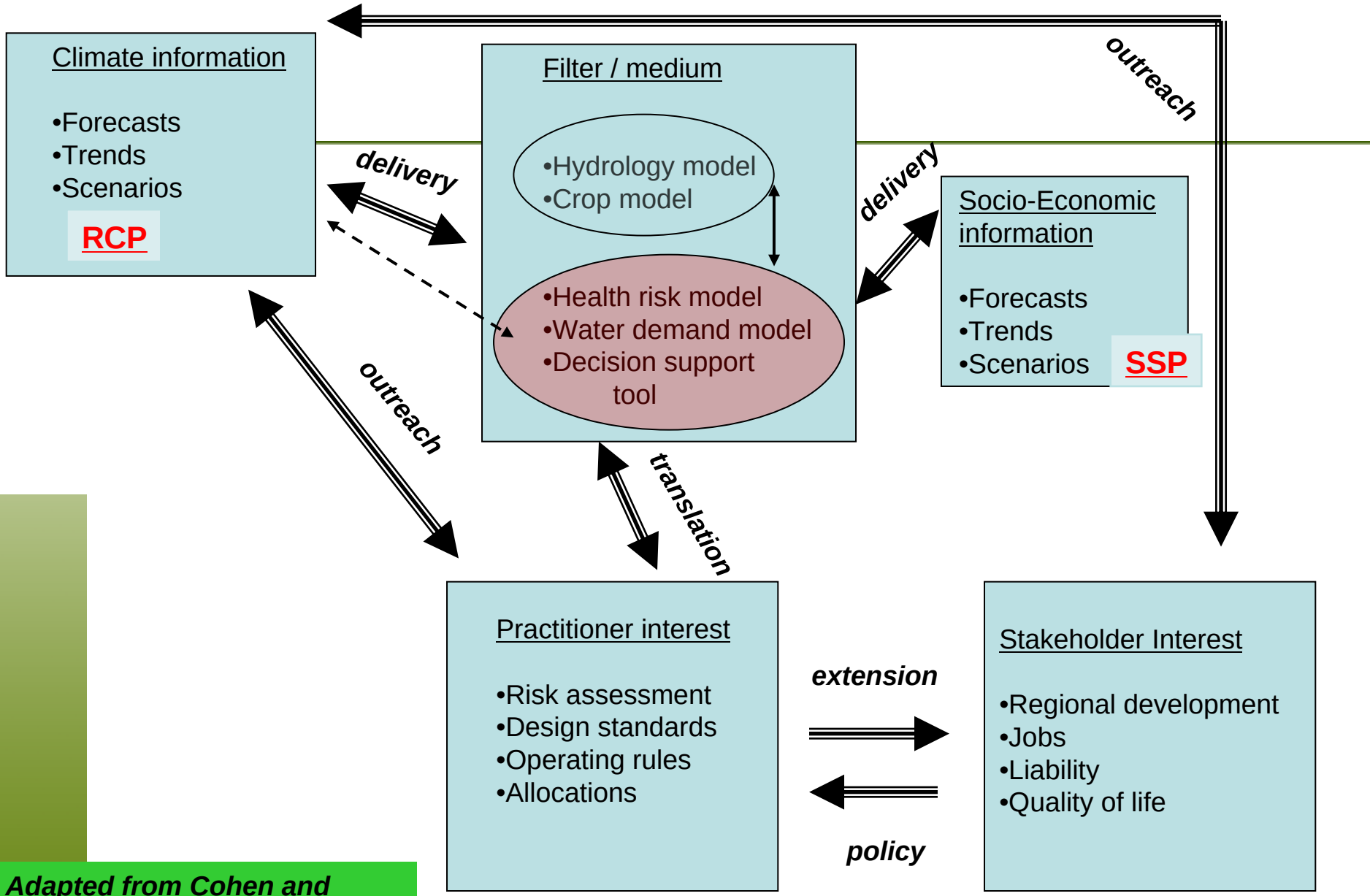
Slide from Harry Nelson

Climate Change: Pathway for Translation

(Cohen, 2010)



Climate Information flow to Practitioners/Stakeholders



Adapted from Cohen and Waddell (2009); Cohen, (2010)

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Care and feeding of climate change "extension agents"

…but what about those 'filters'?

How do those various impact models work together so that the whole impact/adaptation story is greater than the 'sum of the parts'?

Horizontal integration – electricians talking to plumbers….

Inspired by Ken Day

Taking stock of current knowledge, understanding and awareness of threats and risks associated with climate change, please indicate your level of agreement with the following statements *(APFBC Survey, 2013)*.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Don't Know
Globally and at continental scales, the climate is changing faster now than it has changed for millennia.	4%	10%	15%	36%	27%	8%
The current pace of climatic change is significantly affected by emissions of carbon dioxide and other gases.	3%	6%	15%	42%	29%	5%
Climate change has already impacted BC's forests and forest ecosystems.	2%	7%	14%	47%	27%	3%
Climate change impacts will pose future threats for BC forests.	2%	6%	12%	43%	33%	4%
I think it is important to consider climate change in the management of forests.	2%	4%	10%	47%	37%	1%
I know where to find information to inform my management decisions relative to climate change impacts, risks and opportunities.	3%	20%	25%	39%	10%	4%
I have a good understanding of how to assess climate change risks and minimize its impacts.	6%	31%	32%	22%	5%	5%

The biggest barriers I face in working to minimize the impacts of climate change in my forestry decisions are [check all that apply] *(APFBC Survey, 2013)*

Response	Chart	Percentage
Lack of employer awareness of impacts.		12%
Lack of employer interest in minimizing impacts.		18%
Lack of personal knowledge, expertise or ability.		32%
No authority to make adaptation recommendations/decisions.		33%
Lack of strategic vision or policies that support innovation/diversification of practices.		43%
Lack of guidance, standards or best practices.		45%
Costs are prohibitive.		17%
My workload allows little time for this.		25%
No barriers.		14%
Other, please specify...		18%

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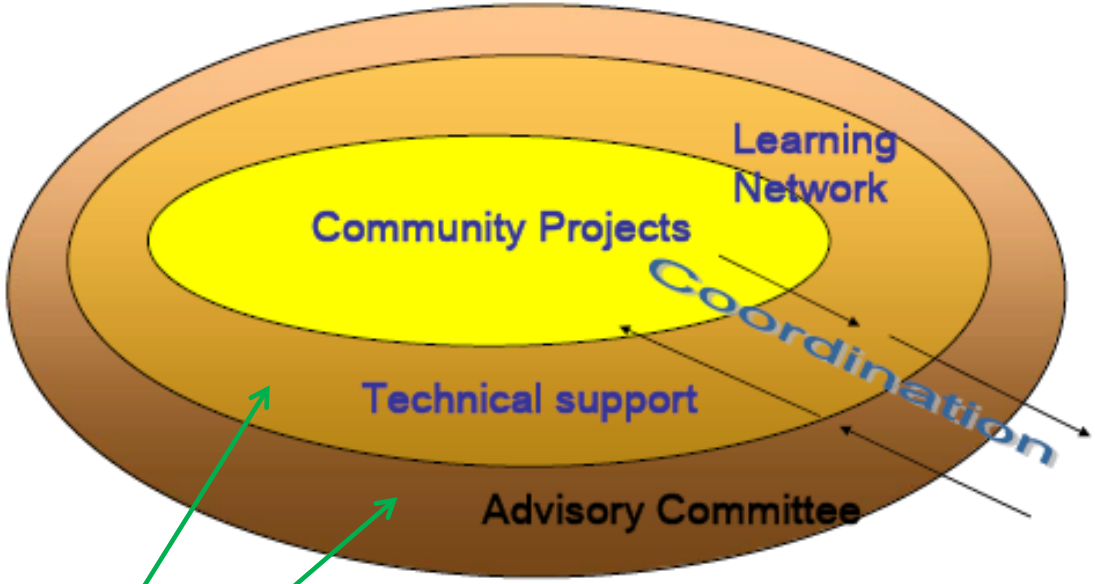
Columbia Basin Trust -- Communities Adapting to Climate Change Initiative [www.cbt.org]

(Cohen et al., 2013)



Climate Service [PCIC]

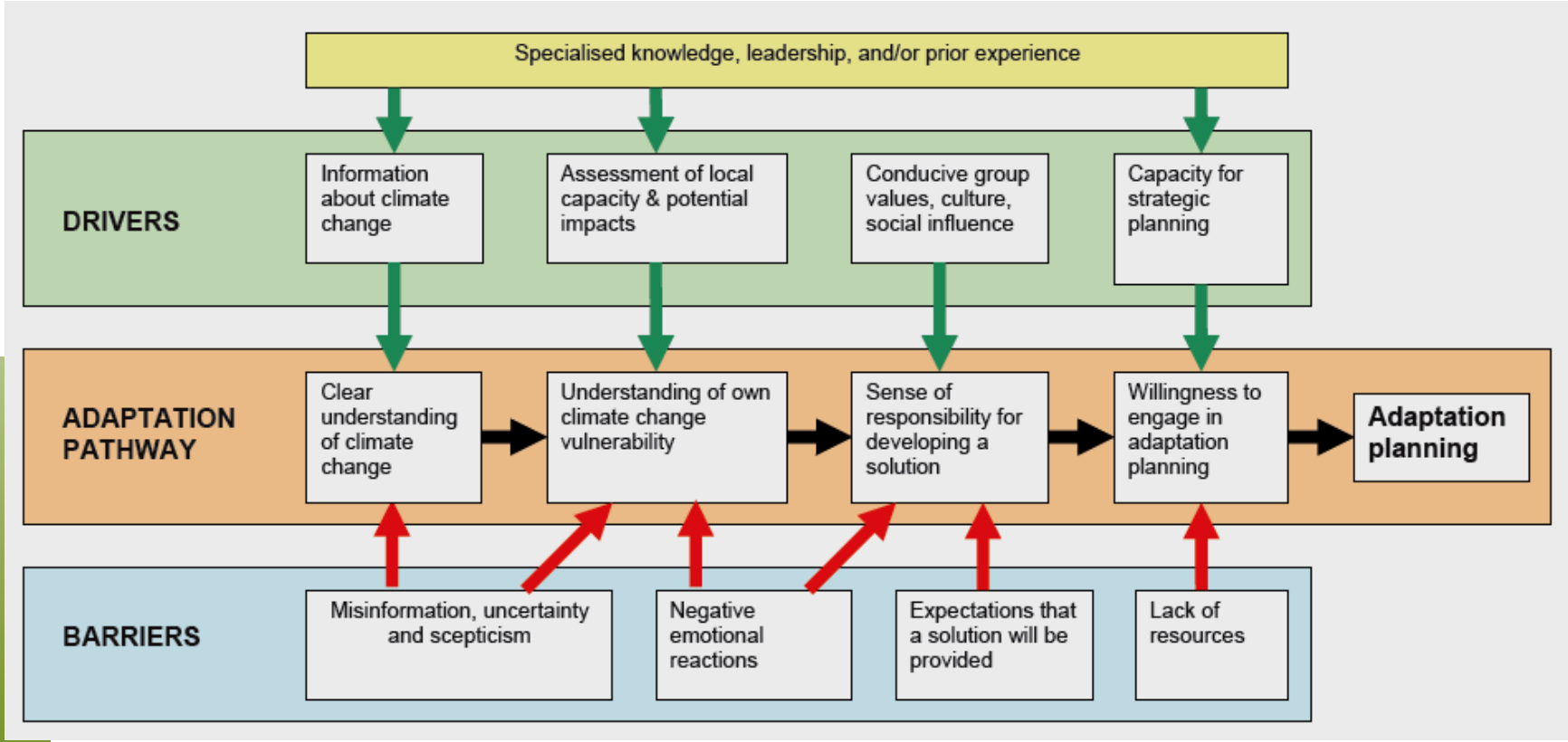
CBT Advisory Committee and community teams, Castlegar, 2008 (upper), Kimberley planning workshop, 2008 (lower).

Shared learning as a river, with canoes, fish, and rocks…

CBT planning workshop, Rossland, September 2010

Pathway for Adaptation Engagement

(Source: Gardner et al., 2009)



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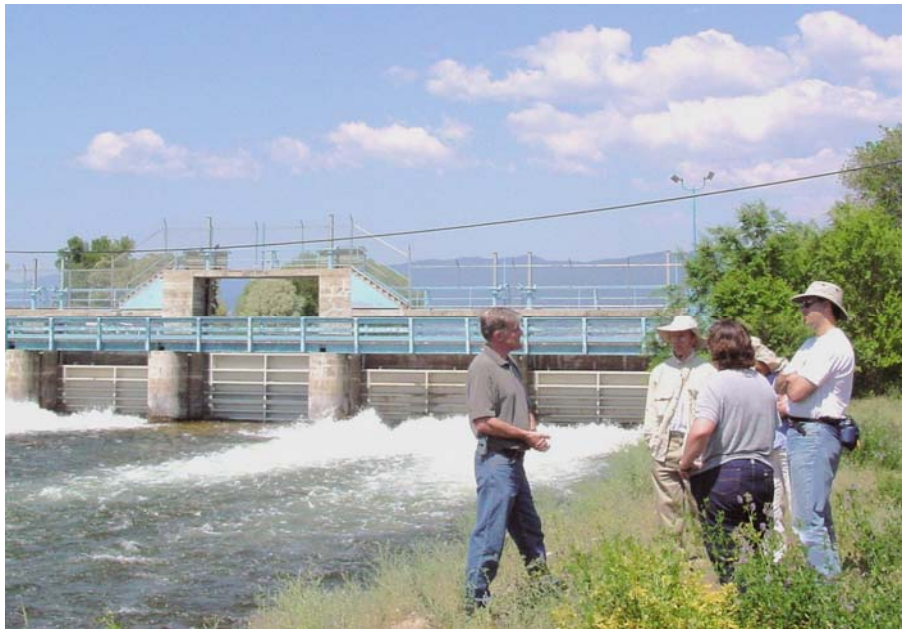
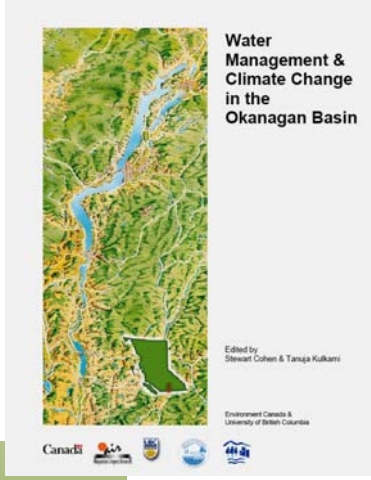
- **Case study: Okanagan Basin, Canada**

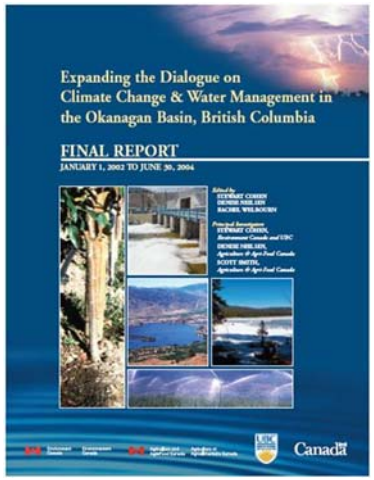
Okanagan studies, 2000-2011 -- Building the science-policy bridge to enable adaptation…

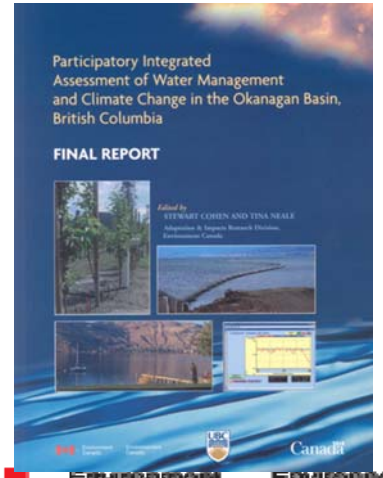


Okanagan climate change study team, Summerland (left) and visit to Penticton Dam (right), June 2002

Climate Change and Water Management in the Okanagan Basin; 2001, 2004, 2006







Source: Okanagan map from Cohen and Kulkarni (2001); funded by grants from Climate Change Action Fund (NRCan)

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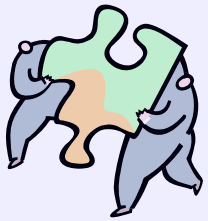
Group-Based Modelling, 2004-2006

linking participatory integrated assessment (PIA) & decision support (STELLA$_{TM}$)….
(photos from Cohen and Neale, 2006)

Technical
Info & Data

+



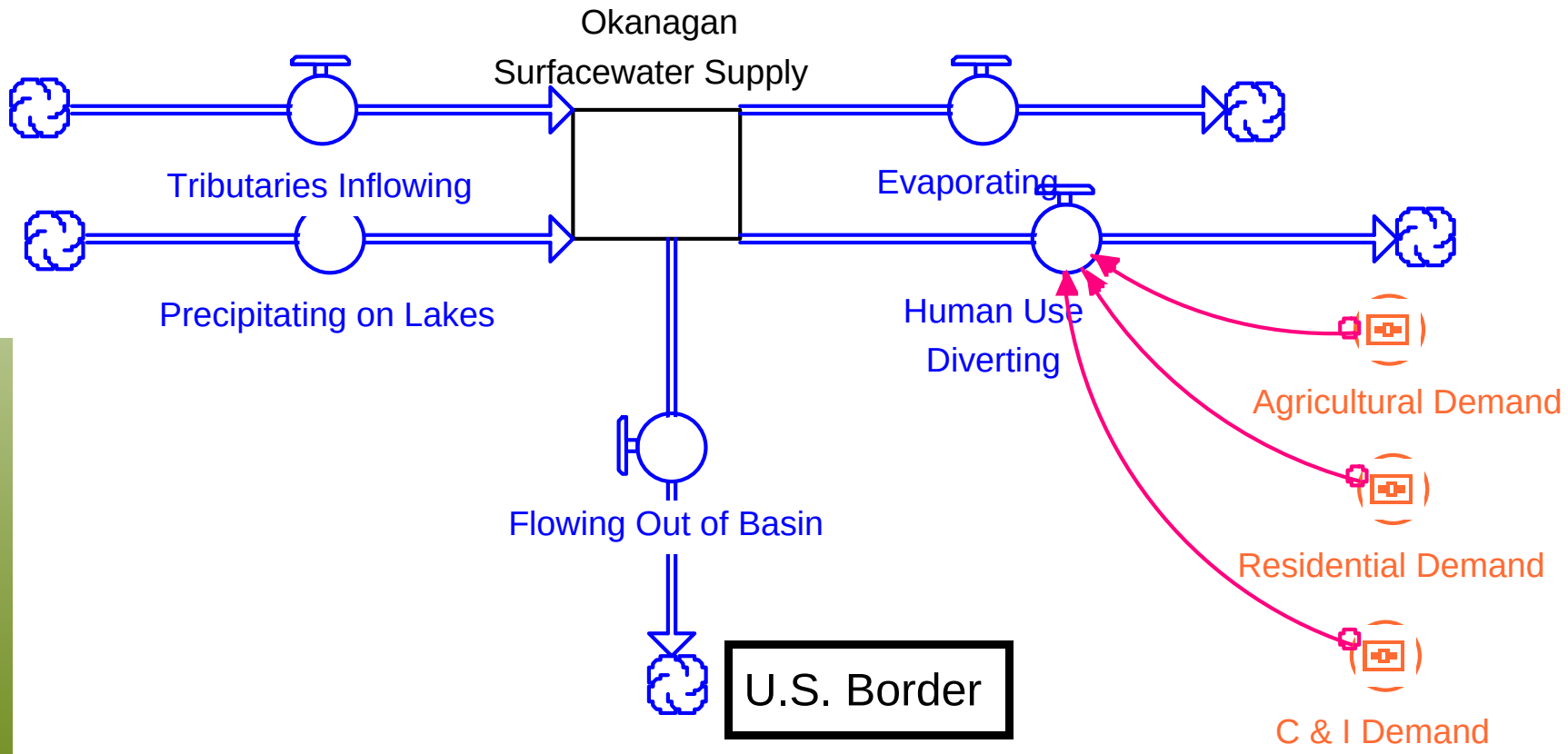
Experience Based
Knowledge &
Values

=

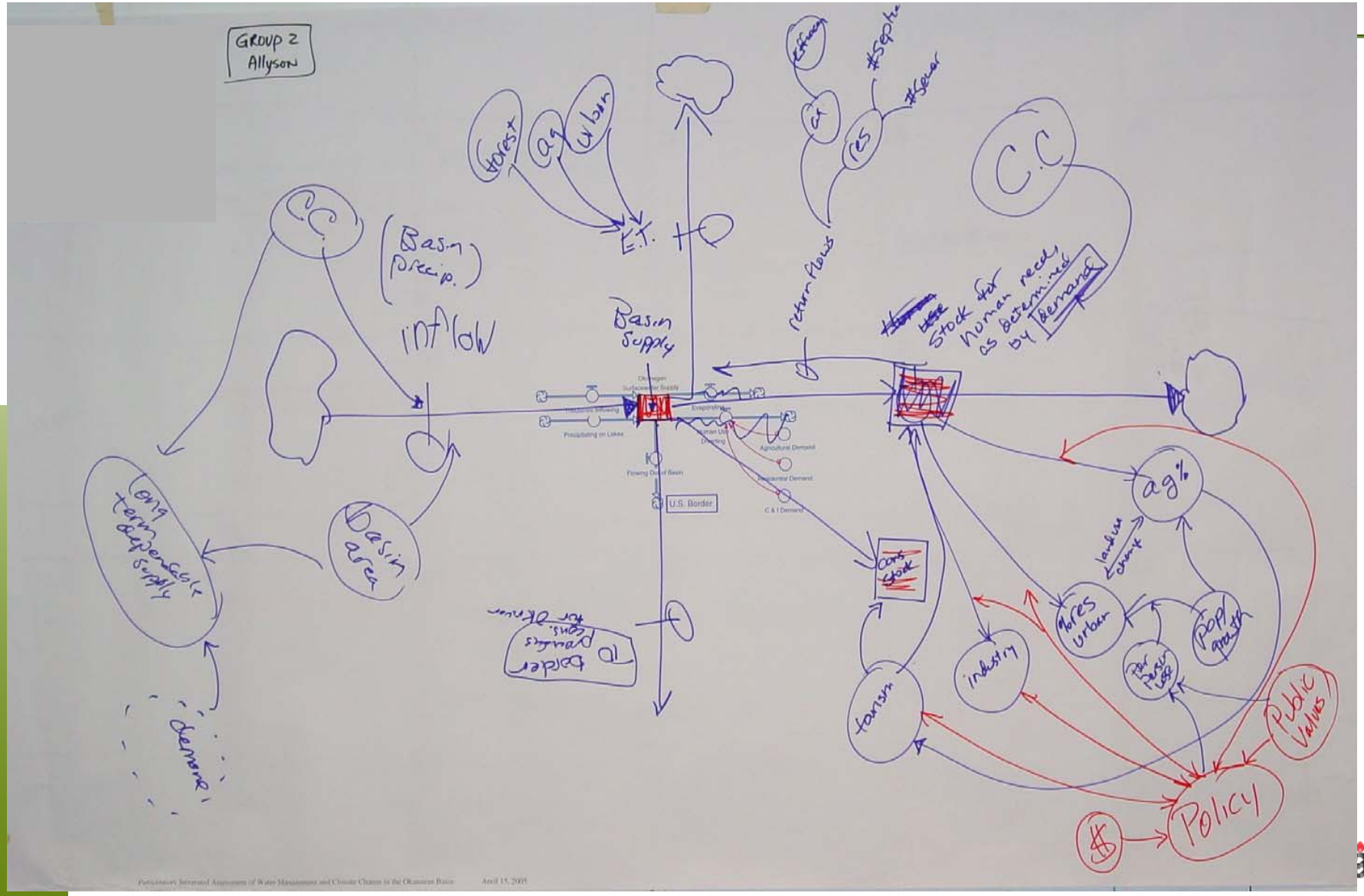
Decision Support
Model

Preliminary sketch of decision model [stock and flow]

(Langsdale et al., 2006, 2007)

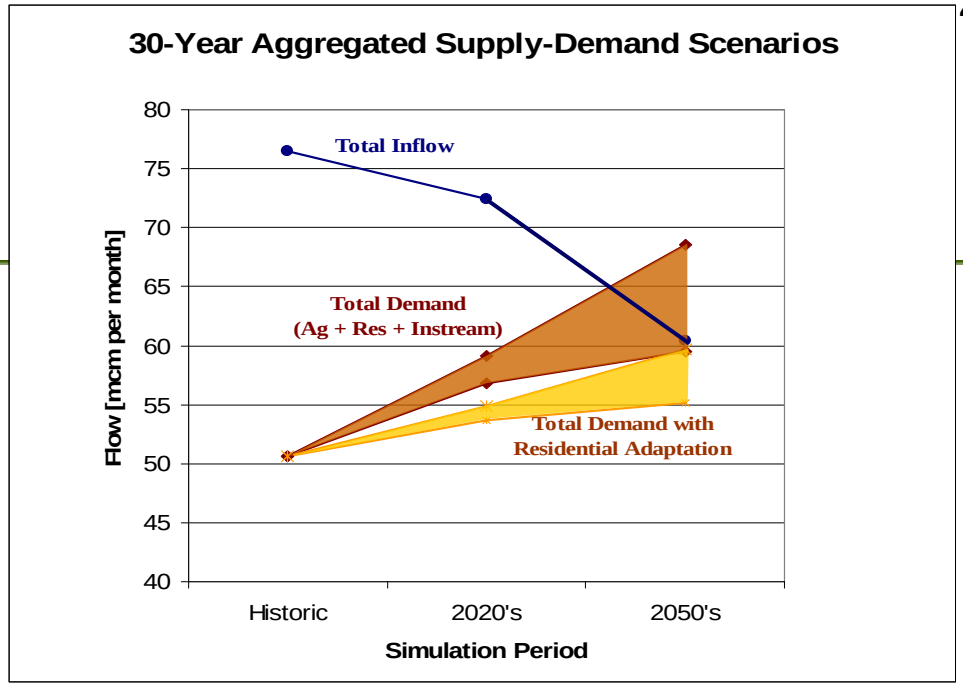


Input from some participants at Okanagan study model building workshop, April 2005 *(Cohen & Neale, 2007)*

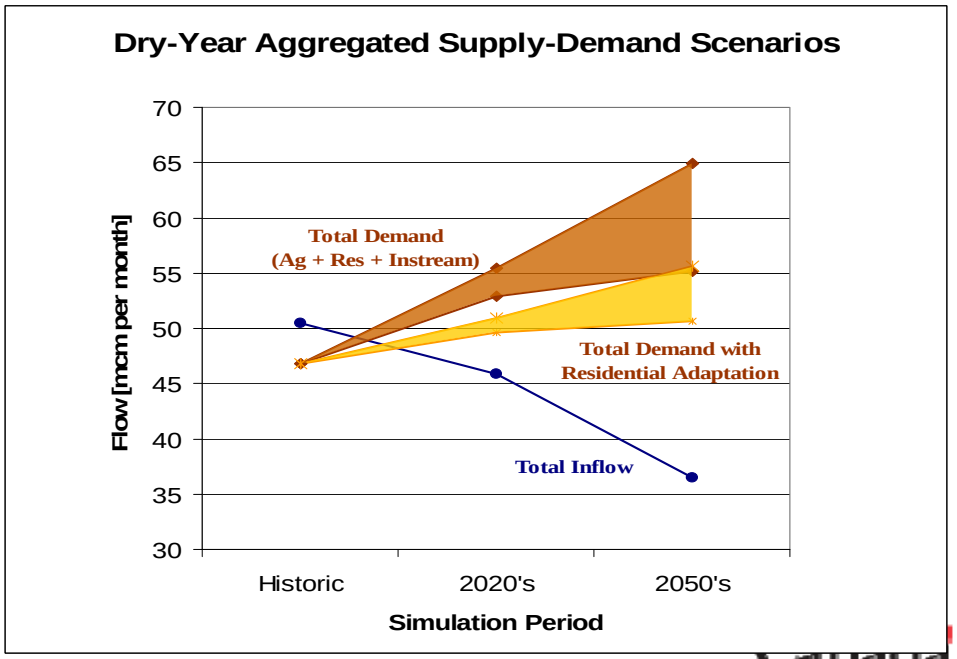


AVERAGE YEAR

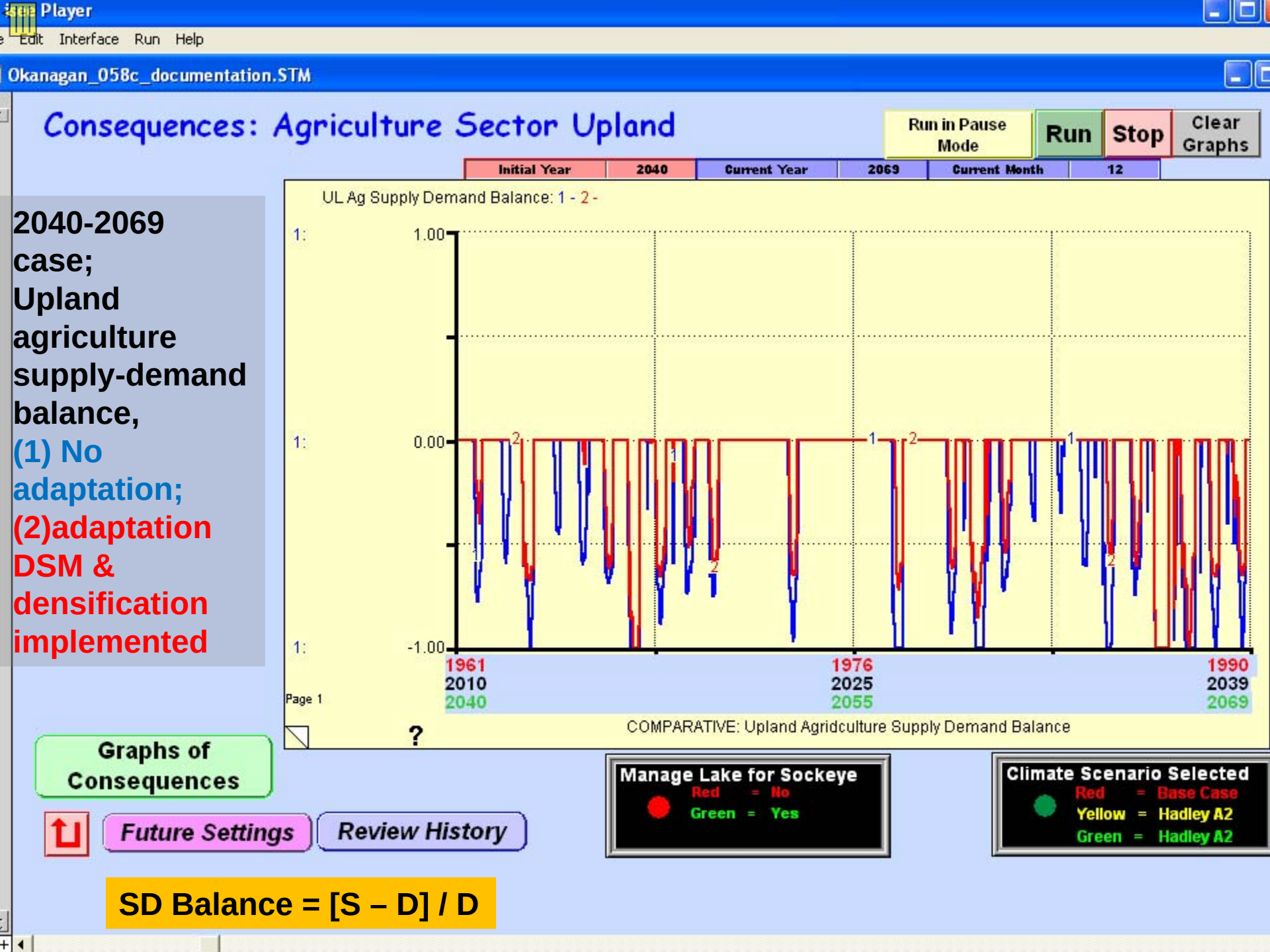
Okanagan Inflows vs. Water Demands, HadCM3-A2 *(source: Langsdale et al., 2007; Cohen and Neale 2006)*



DRY YEAR

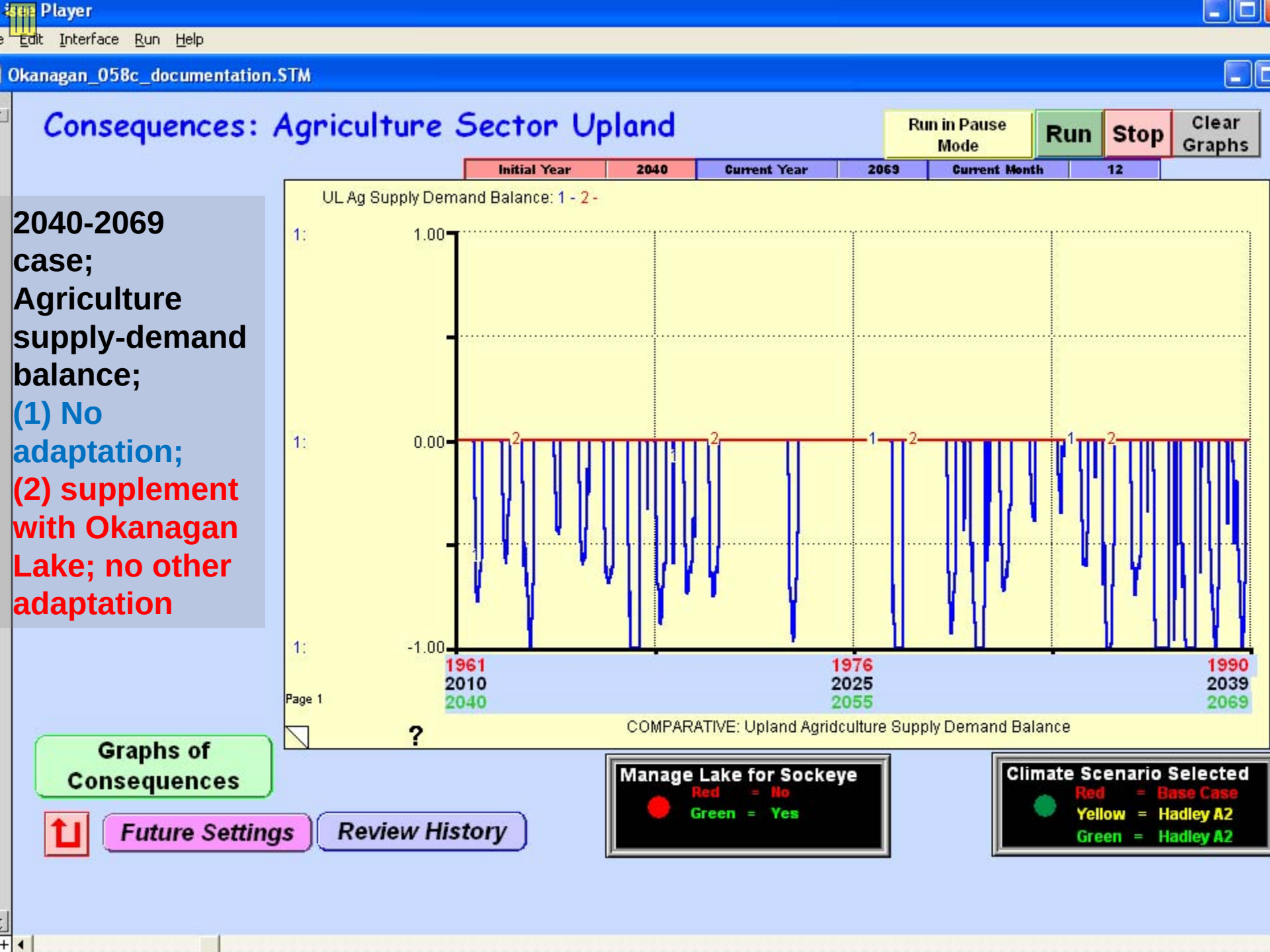


Note: assumes no change in instream demands to support ecosystems, and reduction in agricultural demand in dry years

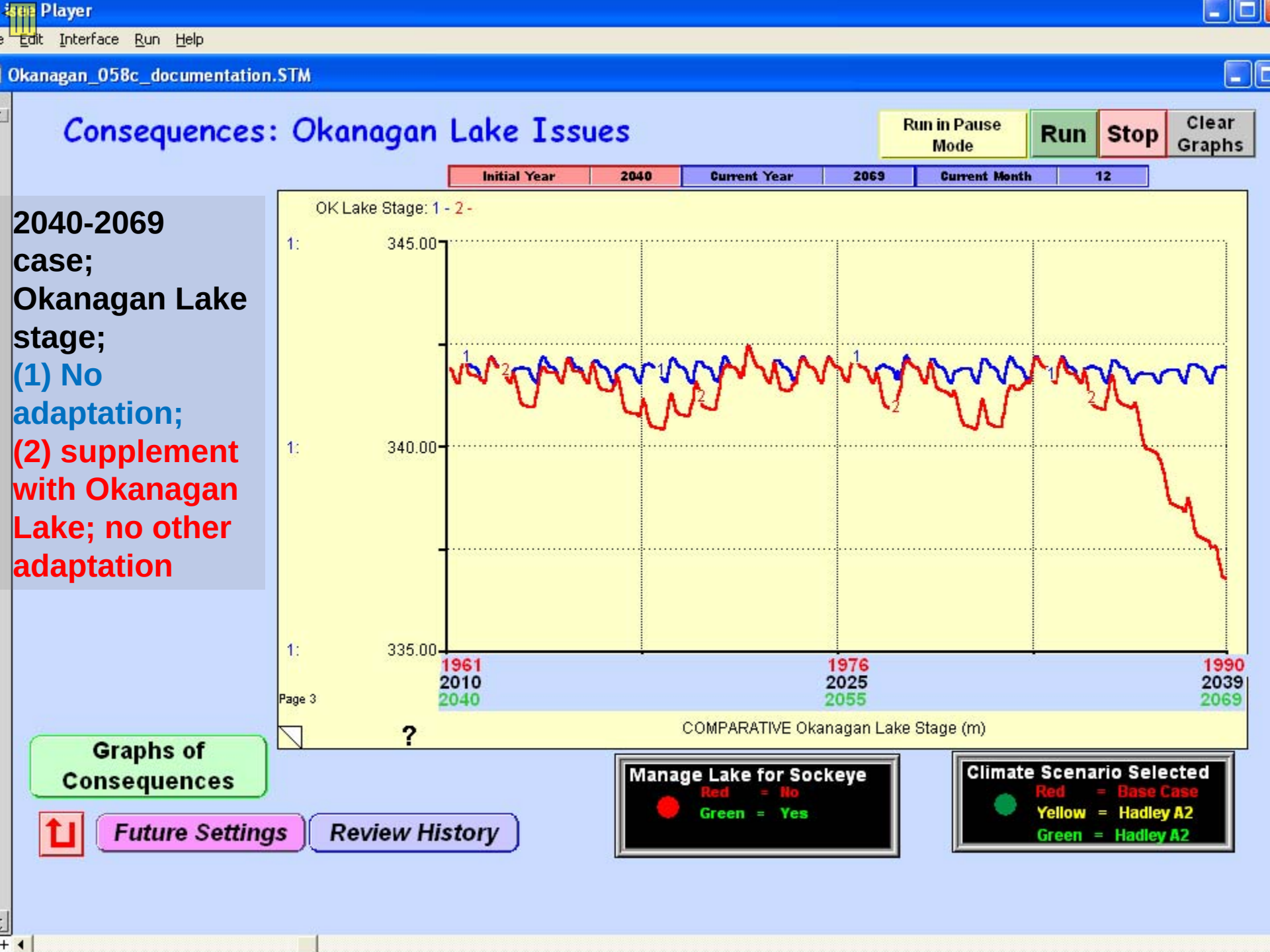


2040-2069 case; Upland agriculture supply-demand balance,
(1) No adaptation;
(2)adaptation DSM & densification implemented

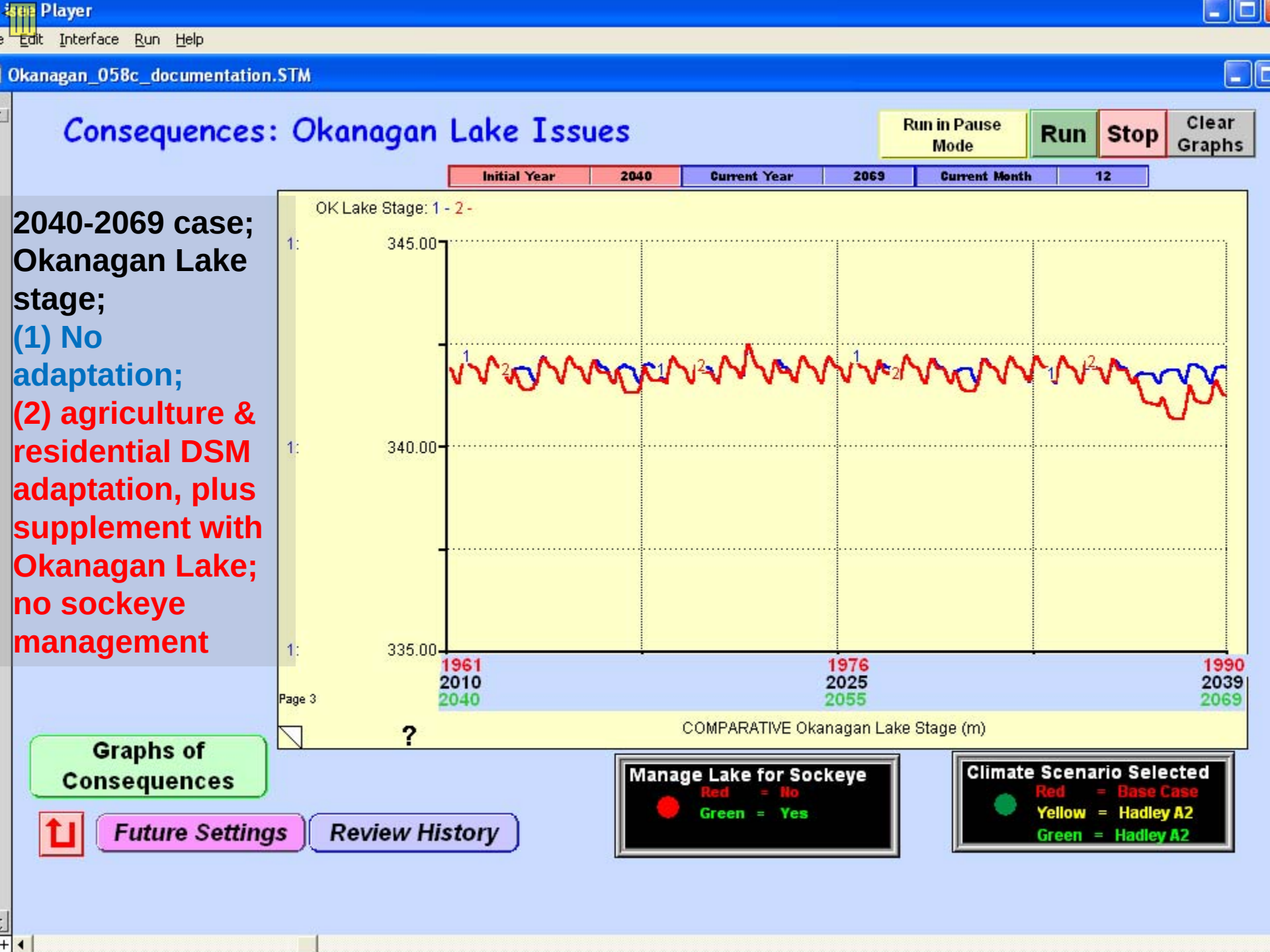
SD Balance = [S – D] / D



2040-2069 case; Agriculture supply-demand balance;
(1) No adaptation;
(2) supplement with Okanagan Lake; no other adaptation

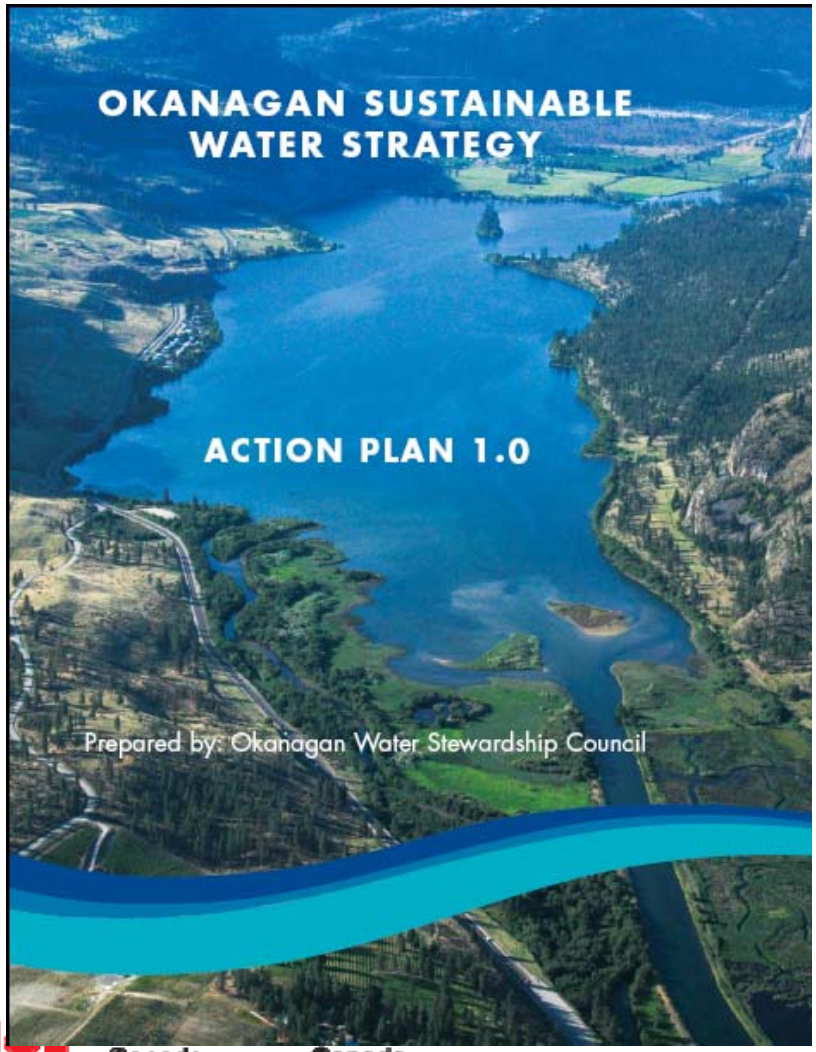


2040-2069 case; Okanagan Lake stage;
(1) No adaptation;
(2) supplement with Okanagan Lake; no other adaptation



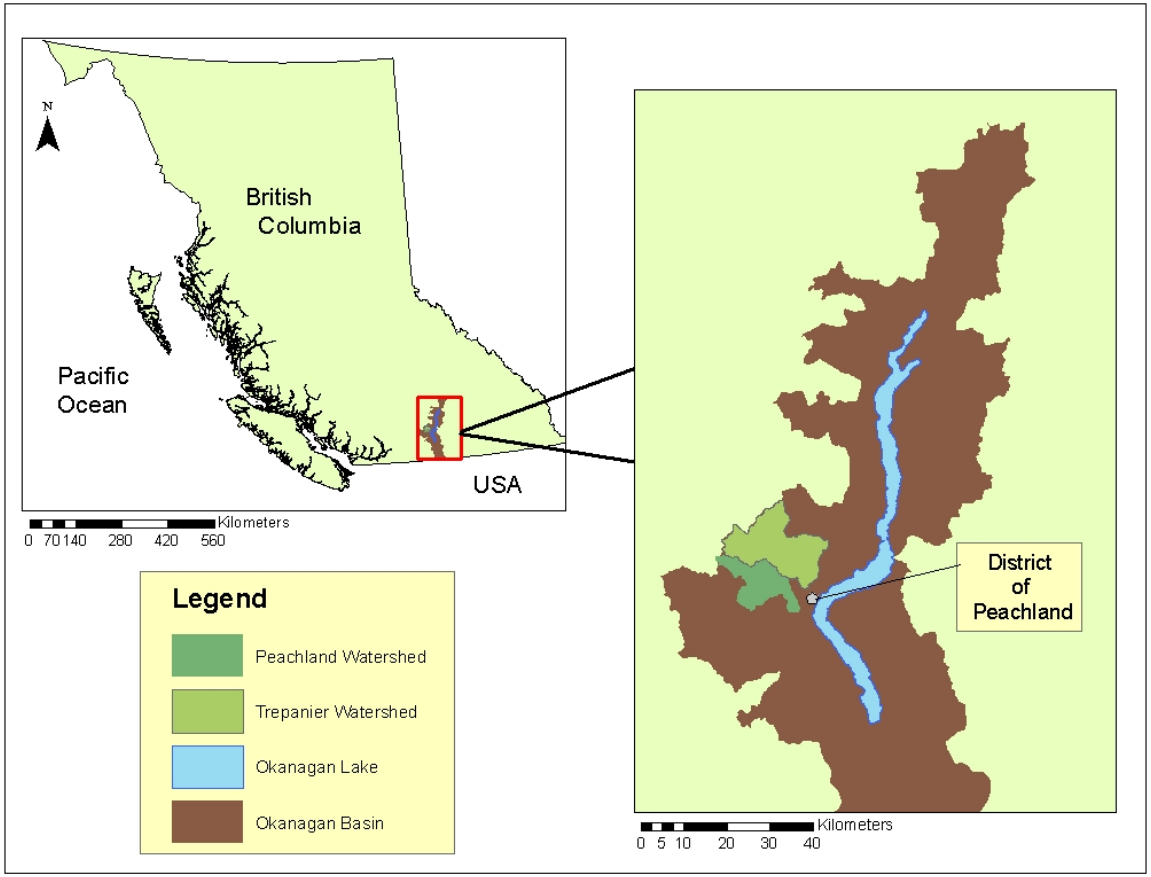
2040-2069 case; Okanagan Lake stage;
(1) No adaptation;
(2) agriculture & residential DSM adaptation, plus supplement with Okanagan Lake; no sockeye management

Okanagan Sustainable Water Strategy



- Sustainable water strategy prepared for the Okanagan Basin Water Board (2008) [www.obwb.ca]
- ***climate change included***
- 45 actions, including:
  - Allocate water within water budget
  - Water conservation and efficiency
  - Increase storage capacity
  - Act like a region
  - Adaptive management
  - Scientific information

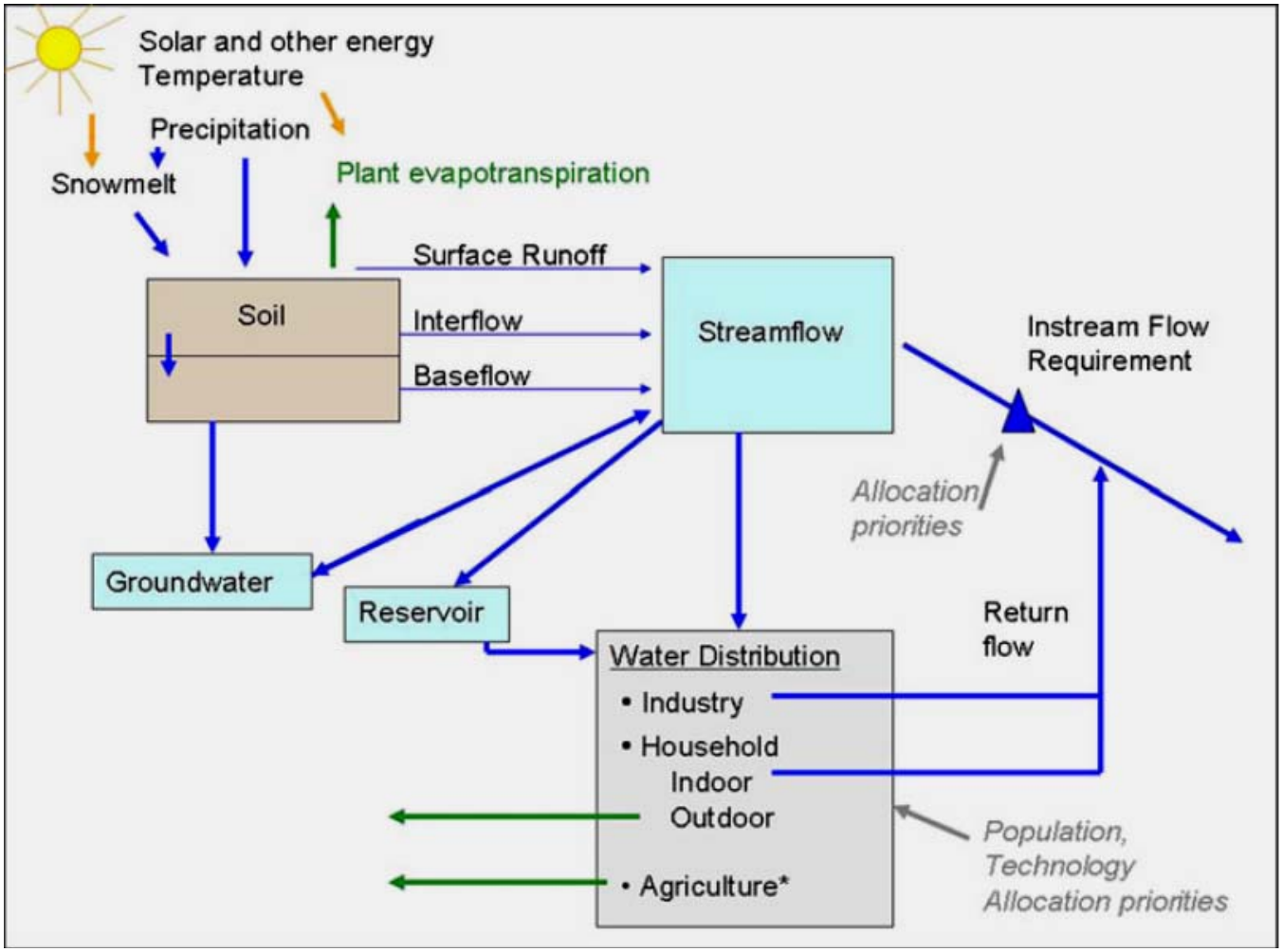
Location of Peachland and Trepanier drainage *(population = 5200; 8800 by 2050)*



Map from Harma et al., 2012

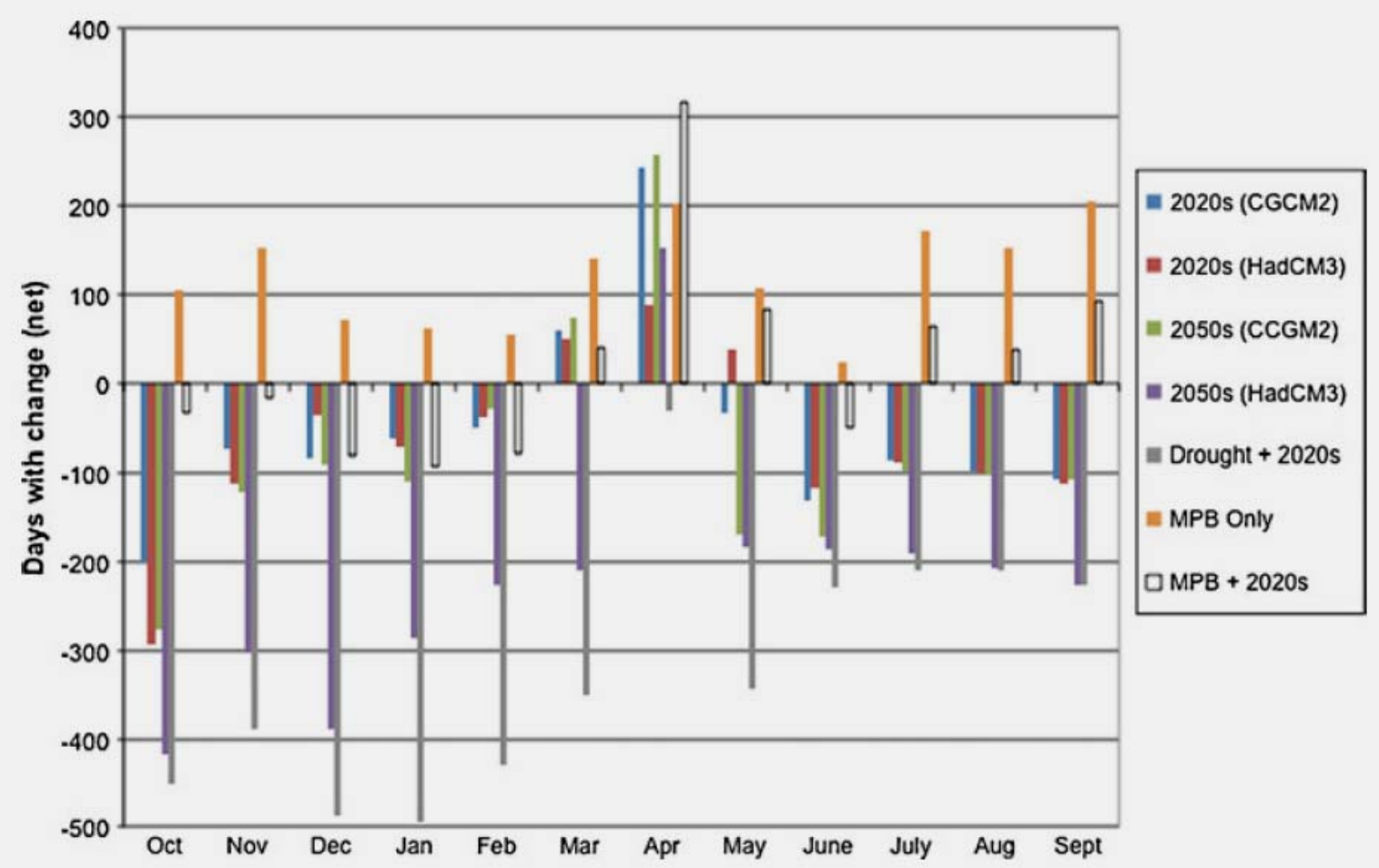
Water Evaluation and Planning System – WEAP: Peachland, BC case study

(Harma et al., 2012)



Translation in Peachland: Difference, in days, in meeting instream flow targets between baseline and scenarios [A2 for 2020s, 2050s]

(Harma et al., 2012)



Each scenario includes 2 x 9-year simulations (2 creeks); 540 days for a 30-day month

So? How can climate change research better enable planning and action?

- **Plumbers and electricians…**
  - **We need more institutional support for interdisciplinary research, learning, and career development**
  - **We need more experimenting with small scale integrative "translation" models/tools, like STELLA, WEAP, other (visualization?) – broaden the range of users of climate change scenarios**
- **Support shared learning in climate change adaptation**
  - **this is different from adapting to past climate/weather events, a challenge to researchers' and practitioners' toolkits**
  - **We need more entry points for local experiences to inform provincial & national planning/programming**
- **Care and feeding of climate change "extension agents"**
  - **Increase local/practitioner capacity to carry out (to lead) adaptation planning and actions**
  - **Climate "service", at national and regional/local scales, including guidance for using and translating "unfamiliar" climate change data**

Contact Information

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