# So what?

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#### Forestry Cost Due to Climate Change

#### CUMULATIVE COSTS DUE TO CLIMATE CHANGE, 2010–2080

	- LOW CLIMATE CHANGE	+ HIGH CLIMATE CHANGE		
REGION	SLOW GROWTH	RAPID GROWTH		
BRITISH COLUMBIA	\$5B	\$32B		
ALBERTA	\$2B	\$10B		
MANITOBA, SASKATCHEWAN AND TERRITORIES	\$5B	\$33B		
ONTARIO	\$10B	\$75B		
QUÉBEC	\$3B	\$2IB		
ATLANTIC CANADA	\$IB	\$6 <b>B</b>		
CANA DA	\$25B	\$176B		
\$(2008), 3% DISCOUNT RATE Paying the price: The Economic Impacts of Climate Change for Canada				

National Roundtable on the Environment and the Economy 2011



1970-2 005

### Cohen Commission on Climate impacts on Fraser Sockeye



## Skeena River Water Conservation Project





#### What does the current tool do?

Possible Outcome 1

Possible Outcome 2

Possible Outcome 3

Possible Outcome 4

Possible Outcome 5

Possible Outcome 6

Possible Outcome 7

Possible Outcome 8

Possible Outcome 9



#### Project Study Area



#### Forest Estate Model



#### Forest Estate Model hypothetical schedule of harvest for Plan 1

- Implemented bioclimatic envelope approach for predicting climate change effects on forest stands
- □ 3 contrasting future climate scenarios were selected:
  - Globally warmer and wetter (CGCM3-A2)
  - Globally warmer and drier (HadGEM-A1B)
  - Globally somewhat warmer & wetter (HadCM3-B1)
- Interpolated local effects on annual climate variables (temperature, precipitation), potential BEC changes

## Ecosystem Change

Because of changes in a number of key attributes our ecosystems in the region are changing.



## Changing location of trees



More detailed application

Number of times a stream is crossed





Existing roads – zoomed

#### Integration and Indicator Module Cutblocks



#### Integration and Indicator Module Cutblocks









## Integration and Indicator Module at Landscape level Road Crossing Density



## Integration and Indicator Module at Landscape level Road Crossing Density



#### Other outputs

Equivalent Clearcut Area
Road Density
Logged Fish Bearing Streams
Disturbed Streams

June 26-27, Planning 2003-2006

## What does the current tool do?









With federal funding support through Natural Resources Canada's Regional Adaptation Collaboratives Program



Natural Resources Canada Ressources naturelles Canada







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## Aspects of Climate Change still not considered.

Flow diagram linking climate, physical and economics and social impacts



#### Healthy Stream

The ability of a stream, river, wetland, or lake and its riparian area to: 1) withstand normal peak flood events without experiencing accelerated soil loss, channel movement or bank movement, 2) filter runoff, and 3) store and safely release water.

#### **Ongoing Adaptation Action**



#### **WWF Network Projects**





## Health Issues

#### IMPACTS OF CLIMATE CHANGE ON HUMAN HEALTH

CLIMATE CHANGE		HEALTH IMPACTS ("Physical impacts")	ECONOMIC AND Social Impacts
Direct exposure (e.g., changes to temperature, preci- pitation, extreme weather)		Heat-related death	Loss of life / avoided death
		Respiratory illnesses	
Indirect exposure (e.g., changes to air, water, the natural environment)		Existing medical problems worsen (e.g., asthma, hay fever)	Changedwelfare
		Heat-related illnesses (e.g., heat stroke)	Costs to health care system
		Changed patterns of illness and death due to cold	Increased vulnerability
			Greater demand for cooling systems, weather defences
		Death from violent storms, heat waves, droughts, etc	-,
		Illness from food— water— vector — and rodent —	

transmitted diseases

Impacts quantified in our analysis