## LOCAL CLIMATE CHANGE VISIONING WORKSHOP

Session I Visioning Process with Future Scenarios

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Collaborative for Advanced Landscape Planning – an interdisciplinary research group applying visual and spatial tools to climate change planning and community engagement



BC Hydro Decision Theatre, CIRS, UBC *Visualization credit: A. Pilon* 



## Workshop Overview

I. Local Climate Change Visioning process – why, when, how Exercise I: Developing alternative community scenarios

Break

- II. Principles for Visualization Planning – 'defensible drama'
  Exercise II: Visualization planning
  III. Implementing Visioning
  Exercise III: Brainstorming how to mainstream visioning at your office
  IV Training Resources and New
- IV. Training Resources and New Developments

### High-carbon pathway





Low-carbon pathway







## Climate change is becoming visible

## What goes around comes around?



# Seeing the world through a holistic climate change lens



## Local Mitigation Solutions





(c) View from a train in eastern Germany: rural communities living cheek by jowl with **co-owned wind farms** that contribute to the local economy.

Photo credits: S. Sheppard

## Graphs and numbers aren't enough

Delta: 1.2m of sea level rise projected by 2100

(BC Sea Dike Guidelines, 2011)



Figure 3-1: Projections of Sea Level Rise source: Policy Discussion Paper (2010)

We need richer, more compelling tools & processes for climate change planning

- Better engagement:
  - making things tangible
  - 'defensible drama'
  - connection to the community
- Better learning:
  - shared understanding
- Better foresight:
  - 'time travel' into the future



### THE DAY AFTER TOMORROW WHERE WILL YOU BE?

IN THEATRES WORLDWIDE MAY 28, 2004

WWW.THEDAYAFTERTOMORROWMOVIE.COM

## I. Local Climate Change Visioning Process

Goals:

- Build awareness and support decisionmaking/policy change/behaviour change/social mobilization
- Localize, spatialize, visualize climate change impacts and solutions (mitigation and adaptation)
- Bridge to more formal planning/decision-making processes, add value









## **Components of Visioning Process**

1. Participation ------



2. Scenario Building



3. Data / Modeling Integration



4. 3D and 4D Visualizations







Northshore Snowpack D. Flanders, CALP; Environment Canada data

2090s Tier 1 (A2) Mean April 1st Snowline (1074m)

# Collaboration with communities, stakeholders, and local experts



Local Working Group workshops

Community feedback though questionnaires, observation, and interviews.







## Visioning Process - workflow

### Iteration of components through phases.







### **Snowpack modelling**

### **Average April 1st Snowline**





Data: Environment Canada; Visualization: D. Flanders, CALP Year

Climate change impacts.... identifying chains of effects









## **Vulnerability—easily flooded areas**

Nanjing Forestry University students Group 6, November 2013



### MOST POSSIBLE FLOODED AREAS

### SECONDARY FLOODED AREAS

# Visualizing Toronto's heat-island data and calculating shade potential from LiDAR

LiDAR modelling of shading (R. Harrap, York University)



# Local Climate Change Scenario Framework: developing meaningful future stories







## Identifying, spatializing and visualizing scenarios



GB-QUEST Modelling/ Tellus regional scenarios for Metro Vancouver (Carmichael)











## Impacts of Local Climate Change Visioning Process?



Delta 2007 public workshops with survey:

Longterm impacts on decisionmaking (interviews 4 years later):

- Increased understanding of local impacts and solutions
- Increased willingness (65-69%) to support local mitigation/adaptation measures
- Local government staff more willing to consider radical solutions to climate change in their community
- Northshore climate hazards study / detailed Delta adaptation scenario assessment
- Widespread use of visual images in the community

# Change in Perceptions of Urgency:

- Before: 23% of practitioners felt that the impacts of climate change are serious now
- After: 46% felt that way

When impacts of climate change will become serious (Metro Van Practitioners; Before) 100 % Respondents 80 60 40 20 Never 100 50 years 20 years It is from years from serious from now now now now

When impacts of climate change will become serious (Metro Van Practitioners; After)



## Participant comments on the process (South Delta community):

- "I learned how climate change could affect my community in a very graphic way. Numbers may not stay with me but visuals will"
- "I was somewhat aware of global warming impacts on the Maldives and polar ice caps - this presentation placed my own community in that context"
- "Felt empowered"

### Kimberley Visioning Study



### **Mountain Pine Beetle and**

fire in the watershed could increase debris flows and accelerate run-off

### **Climate Change**

projected increase of winter precipitation, leading to likely flooding

### **User evaluation**



### Participant rating of visualization benefits in Kimberley public meeting

Respondents n=38, valid n=38 Mean: 4.370, Standard Deviation 1.051

### Over 30 adaptation measures adopted in the final Plan





First phase of work on the Mark Creek Flume Flood Management and Stream Rehabilitation Project (photo: T. Pollock, 2013).

In

### 04/24/2013

# How to structure community climate change scenarios?

- Kimberley Adaptation Plan, BC: with lower budgets, simpler datasets and few projections: 2 composite scenarios (A+M)
- North Vancouver/Delta Visioning Study, BC: with a regional socio-economic model and climate change projections: 4 alternate 'worlds' (A+M)
- Delta Regional Adaptation Collaborative SLR Visioning Study: with flood modelling and GIS: 3 alternative adaptation scenarios
- Clyde River Visioning Study, Nunavut: with community mapping/input, no climate projections: 4 land use planning additive scenarios (A+M)
- Richmond City Centre Redevelopment Study, BC: with energy modelling: 4 additive mitigation scenarios

### **Adaptation Scenario**



FLOOD ADAPTATION GREEN INFRASTRUCTURE

### **Mitigation Scenario**

#### **GREEN RIBBON CONTEXT**

Surrounded by a firesmart, biomass-producing community landscape, a green ribbon of tra nodes along the Mark Creek corridor, with connections to recreational amenities.





## DELTA

The same of the

Example: Delta Visioning Case Study (RAC) Three alternative flood management scenarios:



### Hold the Line Managed Retreat

Build Up



### **How to Adapt?**

#### **Hold The Line**







#### **Hold The Line**







## Build-up scenario – before the flood....



Ladner - DikeView

Build Up Scenario (hypothetical year 2100)

1.2 metres sea level rise

# Build Up Scenario





Ladner - DikeView

Build Up Scenario (hypothetical year 2100)

1.2 metres sea level rise

## **Richmond City Centre Redevelopment**: 3 additive energy scenarios (layers) to reach absolute GHG reductions



## Q& A (5 mins)



