

BUILDING RESILIENT COASTAL
COMMUNITIES IN THE FACE
OF CLIMATE CHANGE
IMPACTS ON COASTAL AND
MARINE RESOURCES AND
ECOSYSTEMS IN BRITISH
COLUMBIA

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Overview

It is usually the case that scientists examine either ecological systems or social systems, yet the need for an interdisciplinary approach to the problems of environmental management and sustainable development is becoming increasingly obvious.

- Berkes & Folke,
1998

- Acknowledgements
- Background: coastal people, coastal places
- Linking climate change and British Columbia's coastal systems
- Purpose and objectives
- Conceptual framework
- Findings – Climate in Ucluelet
- Findings – Community Resilience
- Implications for British Columbia's Coastal Communities

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Coastal People, Coastal Places

- Linking ecosystems and human communities on coasts
- Interactions between coastal people and natural environments; these forces interact to affect the health of natural resources and ecosystems and the health of coastal communities
- The problems of environmental degradation and stressed communities on our coasts
- A build up of stress in coastal areas and communities, which has contributed to an increased vulnerability to additional perturbations or surprises, human and ecological

Linking Climate Change and British Columbia's Coastal Systems

Climate change refers to a change of climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and that is in addition to natural climate variability observed over a comparable period of time.

- IPCC, 2007

- Climate change as an issue for coastal communities in British Columbia
- Potential impacts of climate change on coastal and marine resources and ecosystems
 - Rising sea levels
 - Rising sea surface temperatures
 - Changes in levels of pH and salinity
 - Increases in the frequency and intensity of extreme weather and related natural hazards
 - And more
- Likely consequences for communities

Purpose of Study

- To increase understandings of the potential impacts of climate change on British Columbia's coastal and marine resources and ecosystems and the communities they support
- To increase the capacity of coastal resource-connected communities to absorb and accommodate these changes

Conceptual Framework

- Approaches to understanding the relationship between climate change and coastal communities
- Limitations of the conventional methodology; attempts to provide alternative frameworks
- A new community-centered approach to understanding how we can build resilient communities in the face of climate change in coastal BC
- Six key dimensions

Conceptual Framework

- 1. Interdisciplinary
- 2. Coastal, place-specific
- 3. Community-centered
- 4. Resilience



Resilience

Resilience is the ability of a social or ecological system to absorb disturbances while retaining the same basic structure and ways of functioning, the capacity for self-organization, and the capacity to adapt to change

Conceptual Framework

- 1. Interdisciplinary
- 2. Coastal, place-specific
- 3. Community-centered
- 4. Resilience
- 5. Scale
- 6. Knowledge systems

Study Area



- Ucluelet, British Columbia
- Chosen to represent a range of characteristics:
 - ▣ Biophysical susceptibility
 - ▣ Remote/isolated setting
 - ▣ Connection to resources and ecosystems
 - ▣ Diverse social and cultural interests
 - ▣ Recent experience with environmental and socio-economic changes

Findings – Climate in Ucluelet

- Scientific assessment of historic and future climate and anticipated impacts
- Community-centered analysis of climate
 - Community interpretations of past and current climate
 - Community awareness and understandings of climate change
 - Community perceptions of potential impacts on coastal and marine resources and ecosystems
 - Community perceptions of the likely consequences for the community

Findings – Climate in Ucluelet

Climate Trends Noticed

- Changing weather (temperature and precipitation) and seasonal patterns
- Increases in ocean water temperatures
- Increases in the frequency and intensity of extreme weather events

Potential Impacts Noticed

- Decreases in river levels
- Declining salmon stocks
- Appearance of non-native species
- Changes in coastal and marine species assemblages (abundance, types of species present)
- Changing growth patterns of local crops
- Heat stress in local forests

Findings – Community Resilience

- Community-identified sources of stress (vulnerability)
- Community-identified sources of capacity
- Community identified strategies for building resilience

Findings – Sources of Stress

- Environmental degradation
- Invasive species
- Biophysical susceptibility
- Remote and isolated setting
- Small size
- Dependence on the natural resource base
- Fluctuations in tourism
- Economic inequality
- Lack of opportunities for employment and incomes
- Lack of opportunities for youth
- High costs of living
- Decline in community cohesion
- Resistance to change
- Transient, seasonal and 'unattached' population
- Outmigration
- Alcohol and drug use
- Violence
- Limited availability of government resources, services and support for the community
- Limited community involvement in decision-making

Findings – Sources of Capacity

- Biodiversity
- Abundance of natural resources and species
- Decrease in resource industry-based environmental degradation
- Improvements in ecological health
- Clean air and freshwater
- Moderate maritime climate
- Remote and isolated setting
- Small size
- Independence
- Economic diversity
- New opportunities
- Volunteerism
- Tight sense of community
- People help/support one another
- Communication between community members
- Community-based learning and action initiatives
- People are adaptive/open to change
- Environmental consciousness
- Environmental stewardship
- Close connection to natural resource base
- Access to education and information
- Creative problem solving
- Access to health care services
- Strong, driven and active youth
- Local knowledge and experience
- Active and concerned leadership
- Sustainability-focused community planning
- Emergency planning and response
- Collective/cooperative decision making at the community level

Findings – Strategies to Build Resilience

- Environmental stewardship and wildlife habitat protection
- Support for local resource enhancement programs
- More robust resource management institutions and frameworks
- More sustainable practices of resource use
- More sustainable practices for all local businesses
- A more integrated ('holistic') resource management approach
- An end to resource overexploitation and pollution
- Support for local food sources and sustainable culture practices
- Community involvement in resource management
- Community-based learning and action initiatives
- Community forums/exchanges for communication
- Exploring new opportunities and alternative resources and industries
- Research
- Education, awareness and understanding

Summary and Conclusions

This view from the coast has relevance for the rest of Canada and the world.

- Rosemary Ommer, 2007

- Preliminary findings: indicators of stress and resilience in Ucluelet
- Implications for coastal communities in British Columbia in general
- On the basis of results obtained in the Ucluelet case study, it is suggested that the challenge for our coastal communities is to sustain and enhance sources of resilience within communities and their life-supporting ecosystems
- This must involve the development of mechanisms to build the capacity of communities and environments to deal with disturbance and sustain in the face of change and uncertainty
- A complete discussion of what has been learned and what can be done to build resilient coastal communities, on the basis of results obtained in Ucluelet, is forthcoming



Questions and Discussion