

# Understanding Social Cumulative Effects and Thresholds

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# Development impacts plentiful

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- Social effects numerous
- Fewer social science publications on responses to booms and busts in the North
- Inadequate longitudinal data for the North

# Cumulative impacts: in social world they could get worse or better

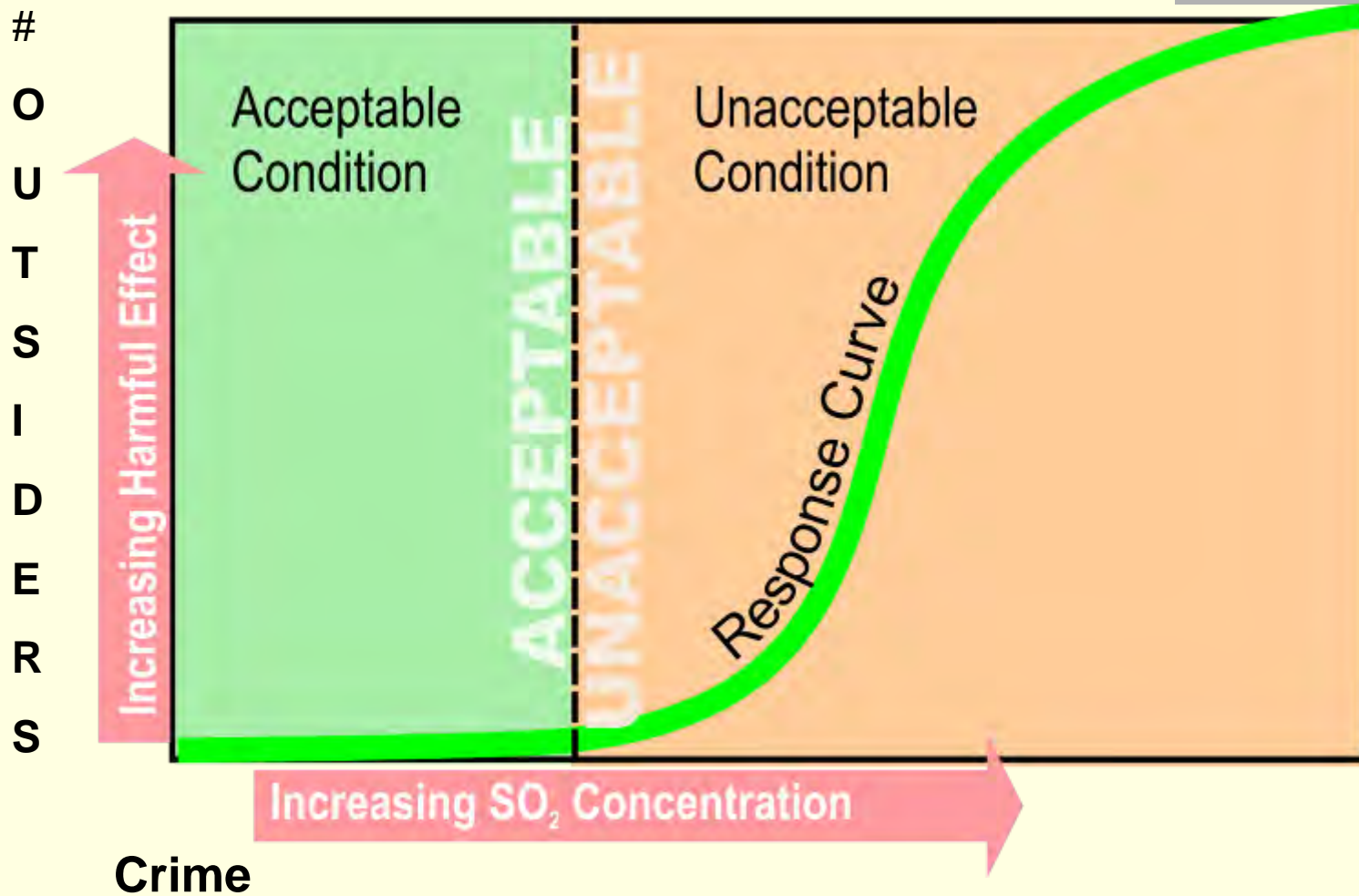
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*Social Learning:*

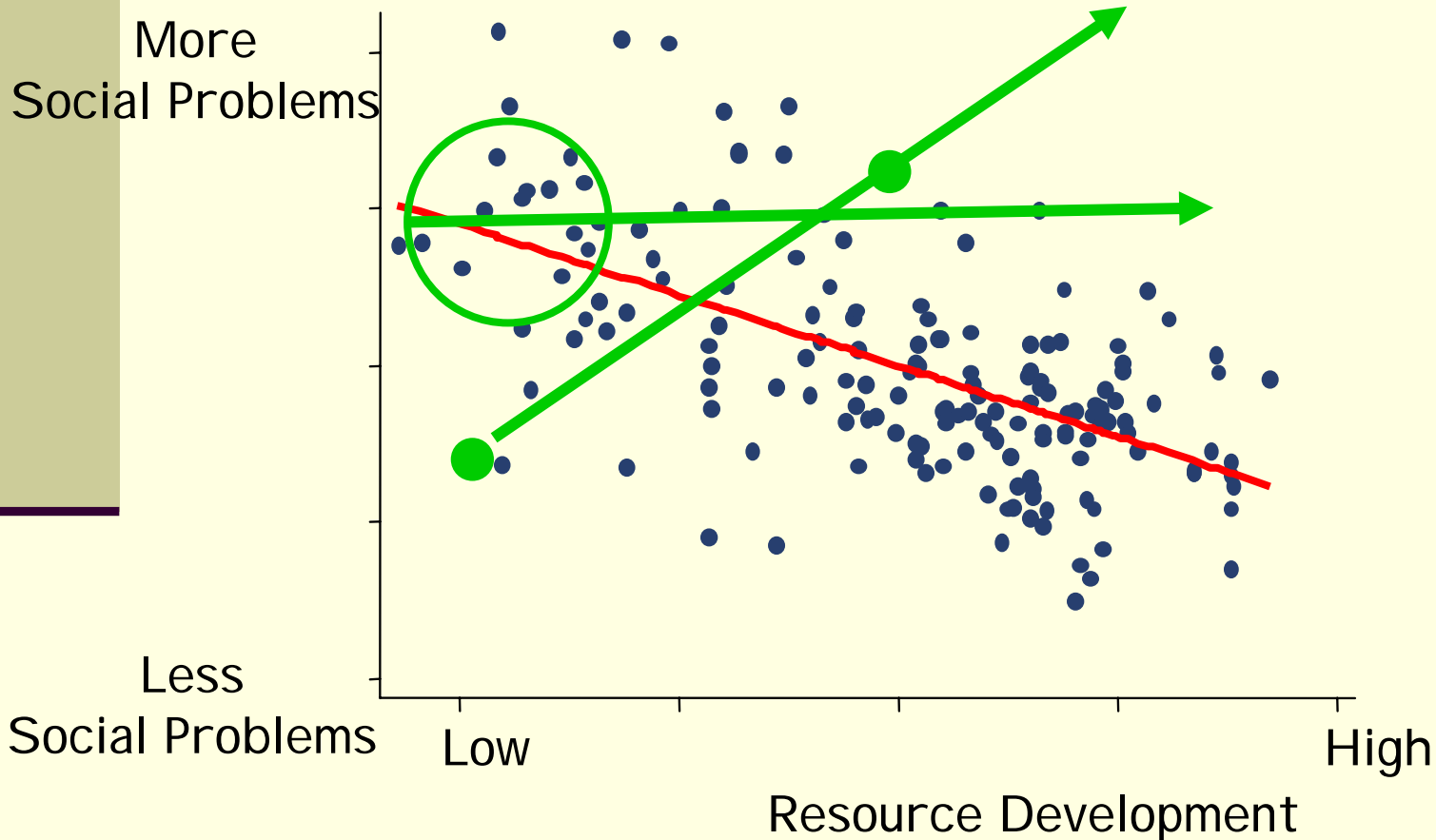
*Interaction among stakeholders to identify diversified ways of getting things done  
(Mutimkura et al. 2004)*



# Ideal Threshold

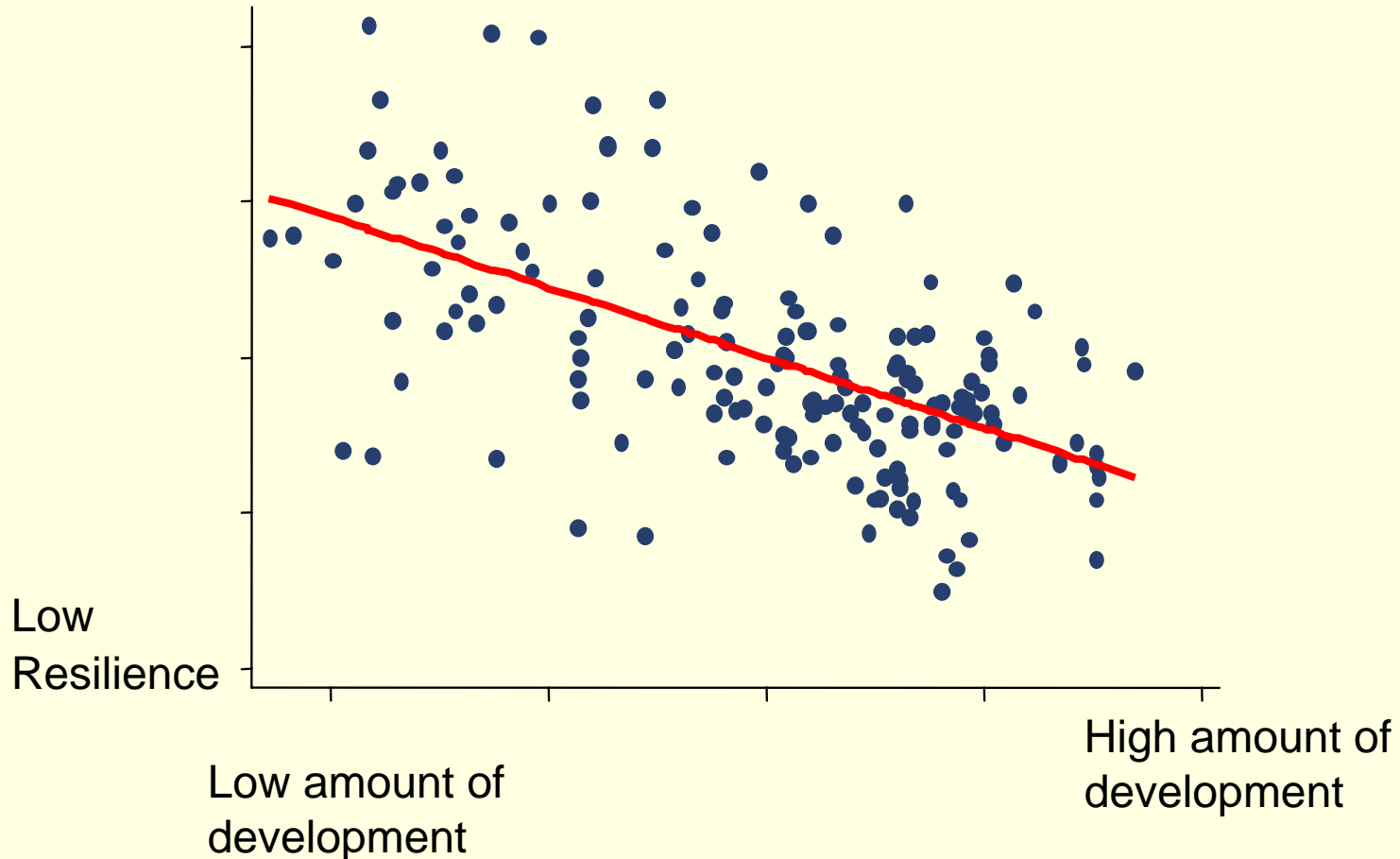


# Hypothetical Community Response to Development



# Or show positive changes

High resilience



# Key social science questions

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- **1. How do we arrive at, and development measurements for, key social thresholds?**
- **2. How do we measure the value of the impacts for people?**

# Thresholds in sociology

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- Assumptions of thresholds
- Need multiple indicators
- Need indicators at different scales
- Dose responses not used in social science lexicon
  - No magical numbers at which community crashes!
- Prioritizing



# Thresholds in economics

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- Economic agents are adaptive so there is an interaction between observed responses to change (behaviour) and preferences
  - Changes in observed behaviour may identify relevant 'substitutes' for 'happiness' as well as identify 'losses'
  - Preferences are also adaptive

# Thresholds in economics

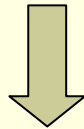
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- Fundamental Assumptions in Economics:
  - The greater the scarcity the greater the 'value' for the remainder relative to everything else
  - Over time, the allocation over scarce resources, is key for land management
  - Options for rules (disincentives and incentives) among alternative land uses will be needed to keep land and resource uses within a collective limit

# What models generally do for us

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**Models Generate “State of the World”**



Outcomes that are valued

- Education
- Health Risk
- Recreation
- Employment Opportunities
- Income level
- Cultural and Spiritual

**Relative Value of Outcomes**

# Modeling Outcomes

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- Land-use Simulation Tools
- Examples: ALCES
- Track stocks and flows (activity levels) for the biophysical impacts.
- Examples:
  - Stocks: energy reserves, forest cover, habitat types, road density, cumulative pollution
  - Flows: production levels for economy and ecosystem
  - Land consumed by forestry, agriculture, and energy sectors, wildlife productivity

# Important Caveats about Modeling social outcomes

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## ■ Advantages

- Compares alternatives
- Communicates impacts succinctly
- Assumptions of causes made clear

## ■ Disadvantages

- Too parsimonious?
- Lends toward those things easiest to measure
- Requires constant updating to validate

# Working with the community of paramount importance...

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- **Effective indicators important**
  - **What to focus on?**
    - **Goals for the community?**
    - **Feared Risks?**
    - **Key negative consequences to be avoided?**
    - **Health?**



# Sociological Approaches available for understanding cumulative effects

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- Case study comparisons
- Secondary data analysis to assess existing trends
- Delphi Study
- Surveys
- TEK GIS maps

# Resource Economics Approaches

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- Need to Understand How People Make Tradeoffs

## 2 Methods

### (1) Observe their choices

- May not have information on choices
  - E.g. hunting behaviour, time use, etc.
- cannot observe choices for intangible goods

### (2) Ask them directly

- Ask preferences over two different scenarios



# Resource Economics Approaches

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- NEI Working Landscapes Project with Kaska Forest Resource Stewardship Committee
- Communities of Ross River, Faro, Upper Liard, and Watson Lake
  - Focus Groups to identify relevant indicators
  - Formal experimental survey to understand tradeoffs among indicators over time.

## Focus Groups

To understand what indicators of well-being are of greatest concern for stakeholders

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The responses were used to develop a survey that enable the inclusion of the voices of more residents

June: FG with community members & Elders

## What We Heard:

Important to plan for future generations (~100 yrs)

Development concerns were incorporated into general survey questions: roads (access), types of forestry etc.

Four Most Important Attributes for the SE Yukon:

% of local residents who have jobs

# of moose (an indicator of wildlife populations)

Fish catch rates (an indicator of aquatic ecosystem health)

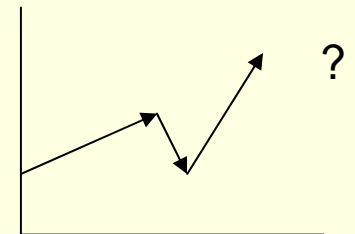
Regional human population

# Environmental Choice Surveys

To identify people's resource development preferences & the tradeoffs made

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- Ask people to make 8 choices
  - Choose between a constant “status quo” scenario & alternative
  - Ask: “Which scenario do you prefer?”
- Each scenario has a set of attributes
  - Descriptors of the alternatives (identified from the focus groups)
- Vary the levels of the attributes over time
  - A realistic range of the attributes in question
  - Such as X number of moose (ie: 150, 230, ?)
  - 3 time periods (10yrs, 50yrs, 100yrs)

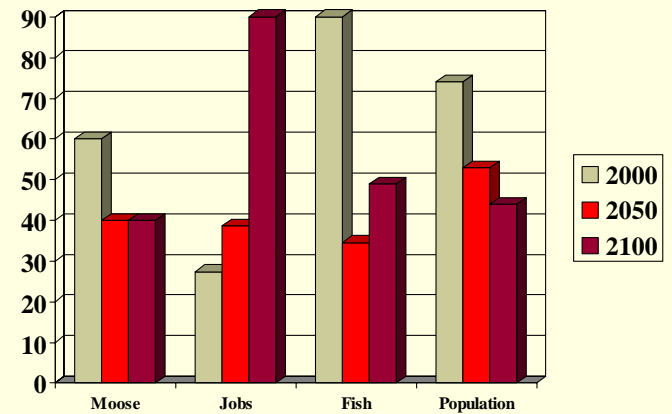
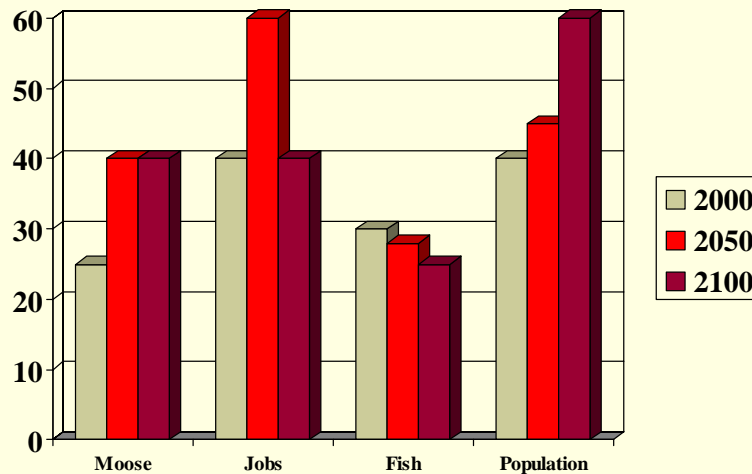


# Valuing Output from Two Scenarios

Individuals were asked to select preferred scenario

Question repeated for multiple scenarios

Results analyzed for multiple individuals across multiple scenarios



# Resource Economics Approaches

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Results to date (preliminary- not statistically valid)

- In general, if they didn't have to give anything up, people want more of everything.
- No evidence (initially) of 'thresholds', i.e., no obvious points at which further development is unacceptable to the whole community
- In other words, no evidence that some people were not willing to give up moose and fish for more jobs

# Resource Economics Approaches

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## Results

- Gives us 'weights' for different scenario outcomes
- Provides information to decision makers who have to choose between alternative landscape options

# Resource Economics Approaches

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- Land Use Planning often falls apart when it comes to making difficult tradeoffs
  - Decision makers often don't have right information about social preferences
  - LUP groups may not have authority to make tradeoffs

# Resource Economics Approaches

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- Remember:
- Win-win scenarios easy to evaluate
- Lose-lose scenarios easy to evaluate
- But what about scenarios with benefits and costs?



# Conclusions

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- Social science concerned with:
  - Adaptation
  - Preferences and tradeoffs
- Need to incorporate these into cumulative effects assessments and decision making processes
- Need to recognize strengths and weaknesses of approaches and transferability of relationships between different settings

# Next Steps

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- Pilot Study on cumulative effects
- Longitudinal summary of changing social conditions in the North and monitoring work henceforth
- Environment Canada strengthens relationship with Native communities



