

Assessing and Communicating Climate Change Effects

Aims:

- Deciding on objectives: are they reasonable and objective
- What are indices of change; of environmental health

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Data:

- Historical data
- Perhaps from a widely dispersed collection with different sources (temperature and weather data, forestry data);
- Digitizing data from images, written records
- Differences in collection schedule, format etc can also occur within specific types of data (temperature) when collected over long periods
- In the forestry context detection changes over time
- Data collected for different purposes than current investigation

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Data Considerations (continued):

- Combining data with different precisions
- Quality of data – assessment of precisions; few opportunities for verification of historical records
- Different study designs -- data collected over long time periods
- Incomplete data: missing responses, missing covariates; little information on reasons for missingness
- Different intervention strategies used over long series; e.g. intervention strategies with regards fire management

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Monitoring Systems:

- Design
- Long-term consistency and yet adaptive

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Modeling and Analysis:

- Standard analytical methods assumed may be improper
- Typical assumptions in standard models don't match requirements for long-scale studies based on a variety of data sources
- Need for flexible modeling strategies; material in this area needs to be amalgamated. Much of this research takes place within specific environmental user communities (coastal studies, forestry) and developments are not usually shared across cultures; reinventions and parallel developments

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Modeling and Analysis (continued):

- Requirements of regulatory bodies
- Massive data
- Skewed distributions; extremes; mixtures

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Modeling and Analysis (continued):

- Lack of inferential techniques and testing procedures; diagnostics and goodness of fit procedures
- Difficulties and questions surrounding simulation models
- Evidence on emerging trends; inference on causal relationships (attribution); forecasts of potential impacts
- For climate change impacts analysis, incorporation of outputs from weather “black-box” models

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Communication:

- Reliability of results
- Validation of methods
- Combining expert opinions: combining evidence in meta-analyses
- Sometimes being overly critical of other research; inability to see beyond one's viewpoint
- Creating meaningful summaries (data visualization) for informing public discussion and policy making: methods for conveying estimates of uncertainty, management strategies under uncertainty