

Research Needs for Cross-cutting Issues in Climate Change

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Broad Categories

- Data Management
 - Collect once, use many times
 - Retrospective; extends new information
- Monitoring (Observing)
 - Discrete, synoptic
 - Change detection; model constraints
- Modeling (Predicting)
 - Appropriate reliability
 - Appropriate spatial & temporal resolution

Data Preservation & Management

- Importance:
 - Historical data cannot be regenerated
 - Preservation can be cost effective
 - Data have to be 'important' and 'useable'
 - Metadata issues
- Challenges:
 - Usually collected with one use in mind
 - Access and awareness
 - Archival upkeep is hard to fund (need policy)
 - Retro-building metadata is labor intensive
 - Requires coordination across disciplines, agencies, etc.
 - Which data should (can) be preserved?

Monitoring

- Importance:
 - Initial characterization
 - Detecting change
 - Model input, constraints, validation (ground-truthing)
- Issues:
 - Broad diversity (biophysical, socio-economic, industrial, etc.)
 - Diverse approaches (satellite, automated stations, field researchers, community based)
 - Need for standards
 - Focus on long term records
 - Preservation & broad access is critical

Modeling

- Importance:
 - Extends capabilities of monitoring
 - Only means of forecasting
- Issues:
 - Important types: GCMs, mesoscale weather models, economic forecasts, socio-ecological models (ABM)
 - GCMs only calculate trends (no inter-annual variations)
 - GCMs require regional downscaling to be useful at the state/community level
 - Concerns over sufficient validation, reliability (mitigated with hindcasting and other testing approaches)

Common Needs

- Strong inter-agency coordination & standards policy
- Significant new investment
 - Not popular with funding agencies, law makers (orphans)
- Promotion, access, updating to be useful
- Richly populated metadata
- Formats & information products tailored to client needs