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