

## AR4 Cluster B

### Consistency in observed climate change

- 3, 4, 5 Ensuring consistency among variables
  - 3, 4, 5 Role of 3.9 and Technical Summary
  - 3, 6, 9 Consistent coverage of observed changes
  - 9, 11 Interpretation of NAO shift
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- Reach consensus
  - Decisions for actions
  - Conclusions, assignments

## AR4 Cluster B

### Consistency in observed climate change

- 9, 11 Interpretation of NAO shift
- The issue here is broader: what are the regional aspects of climate change?
- What are observed regional trends?
- C3: will have global maps, patterns associated with "modes", some regional aspects related to monsoons, extremes
- Data to be passed to C11 for use
- For use with regional projections

## AR4 Cluster B

### Consistency in observed climate change

- sea ice with SST
- snow cover with snowfall and temperature
- glacier melting and permafrost changes vs temperatures
- borehole temperatures, glacier changes and paleo record
- overlap between paleo record and instrumental record
- salinity vs precipitation
- ocean heat content with SST and surface fluxes
- sea level rise as an integrator: ocean expansion, melting of land ice, increased water storage on land, and changes in TOA radiation (presumably led by Chapter 5.)
- Issues consist of use of consistent temperature and precipitation records (don't use NCEP surface temperatures as in Ch 4 CQ).
- overlap and redundancy

## Cross Chapter coordination

- Issues: use of consistent temperature and precipitation records
- Avoid overlap and redundancy: c3,c4,c5,c6,c9

### Contacts:

- sea ice (SSS) c4, heat transport ocean c5, with SST c3  
Parker, c4 Allison, c5 Bindoff, c9 Nicholls
- snow cover with snowfall and temperature c4 Mote, c3  
Easterling, c9 Nicholls
- glacier melting and permafrost changes vs temperatures and precipitation  
c4 Kaser, Zhang; c3 Jones, c5 Shum, c6 Solomina, c9  
Nicholls
- borehole temperatures, glacier changes and paleo record  
c3 Jones, c6 Briffa, c4 Kaser
- overlap between paleo record and instrumental record  
c3 Jones, c6 Briffa

## Cross Chapter coordination contacts:

- salinity vs precipitation , c3 Easterling, c5 Bindoff, Levitus, c4 icebergs => c5 Allison
- ocean heat content with SST and surface fluxes  
c3, c5 Gulev
- sea level rise as an integrator: ocean expansion, melting of land ice, increased water storage on land, and changes in TOA radiation (**led by c5.**)  
Cazenave, Shum,  
c4 Kaser (glaciers), Alley (ice sheets), c6 Peltier,  
c3 Trenberth (water vapor), c4 Zhang (ground ice),  
c9 Stott

- C3: Jones (general), Parker (MSU), Zhai (tropical), Klein Tank (extremes)
- C5: Bindoff (heat content), Levitus (Ice stuff), Shum (glaciers)
- C9: - MSU, urbanization: Nicholls
  - Large scale modes, circulation: Nicholls, Gillett
  - Tropical change: Marengo, Luo
  - Changes in extreme events: Marengo, Zwiers
  - Snow cover: Nicholls
  - Sea ice: Stott
  - Glaciers and small ice caps: Hegerl
  - Oceanic climate change and sea level: Stott
  - Biogeochemical tracers: Braconnot
  - Permafrost Zhang => c9

**ACTION:** obs chapters to send relevant FOD sections to c9 (Zwiers, Hegerl)

# Integrated assessment

- sea level: Chapter 5
- paleo record vs instrumental Chapter 6

## Overall Chapter 3.9: vs Technical Summary

- 3.9 Synthesis: Consistency Across Observations
- 3.9.1 *Consistency of Observed Trends*
- 3.9.2 *Consistency with the Retreat of Glaciers, Sea Ice and Snow Cover and Sea Level*
  - **Each chapter to synthesize relevant topics**
  - **Brief in 3.9**
  - **Mainly TS**
- T increase (land, SST, subsurface ocean), snow retreat, sea ice retreat, thinning, freezing season shorter, glacier melt, sea level rise, permafrost, soil temperatures
- Precip changes, drought, salinity, ocean currents, P-E, snowfall, snow cover.

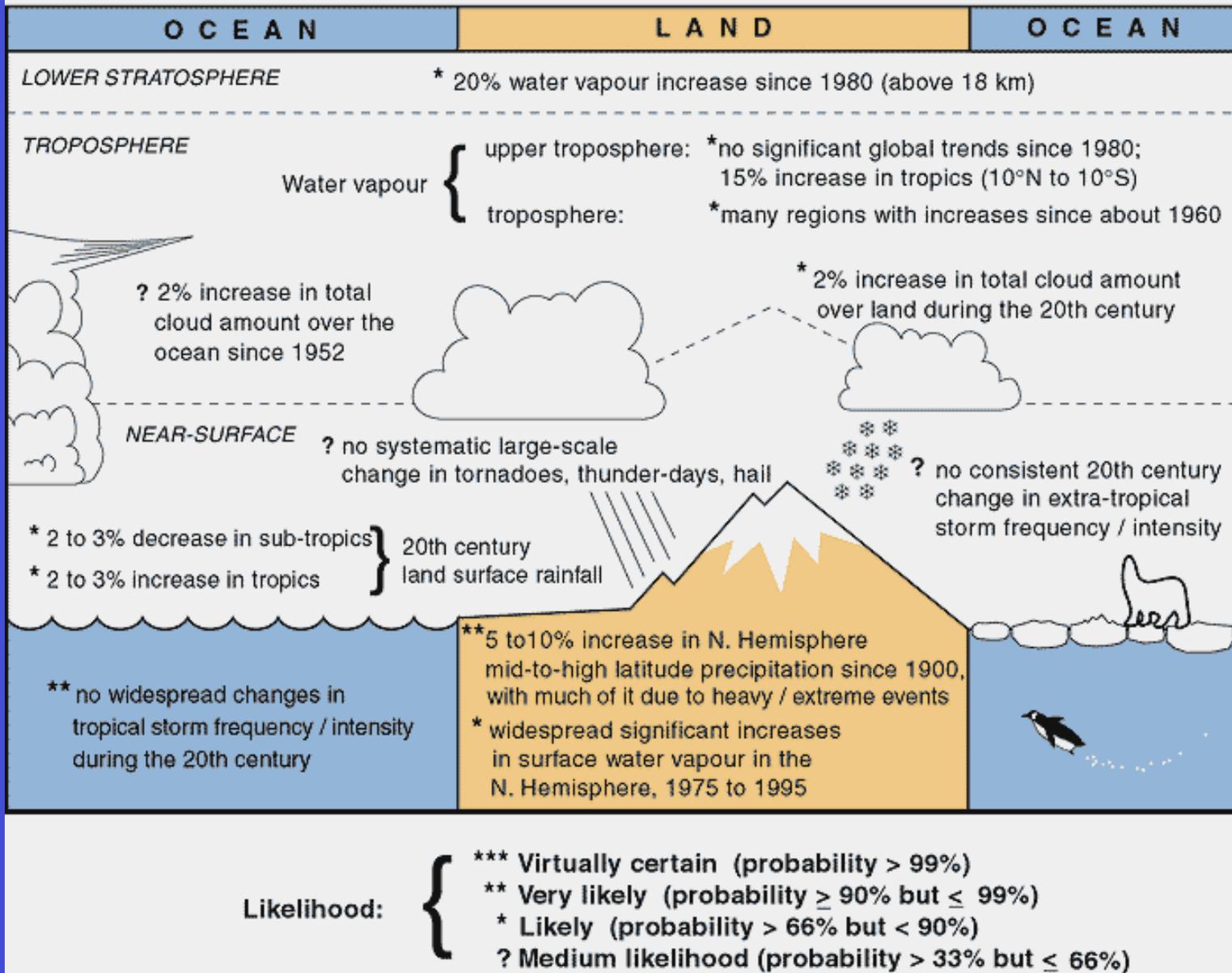
# Integrated assessment

## Synthesis diagrams, modeled after the TAR?

- Temperature related c3
- Precip related c3
- Cryosphere c4
- Sea level c5
- Need for confidence, significance, uncertainty
- Need for Obs chapters to formulate these figures



## (b) Hydrological and Storm related Indicators



Many hydrological indicators have low confidence in how they have changed.

# 20<sup>th</sup> Century Sea Level Rise - IPCC, 2001

