IPCC '07: Setting the Stage

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- 2007 is the year in which the Intergovernmental Panel on Climate Change will (finally) release its Fourth Assessment Report (FAR).
- While the full report will not be available until late summer, portions (Summaries for Policymakers) are out.
- This talk attempts to lay the foundation for the conference with a very brief overview of these summaries.

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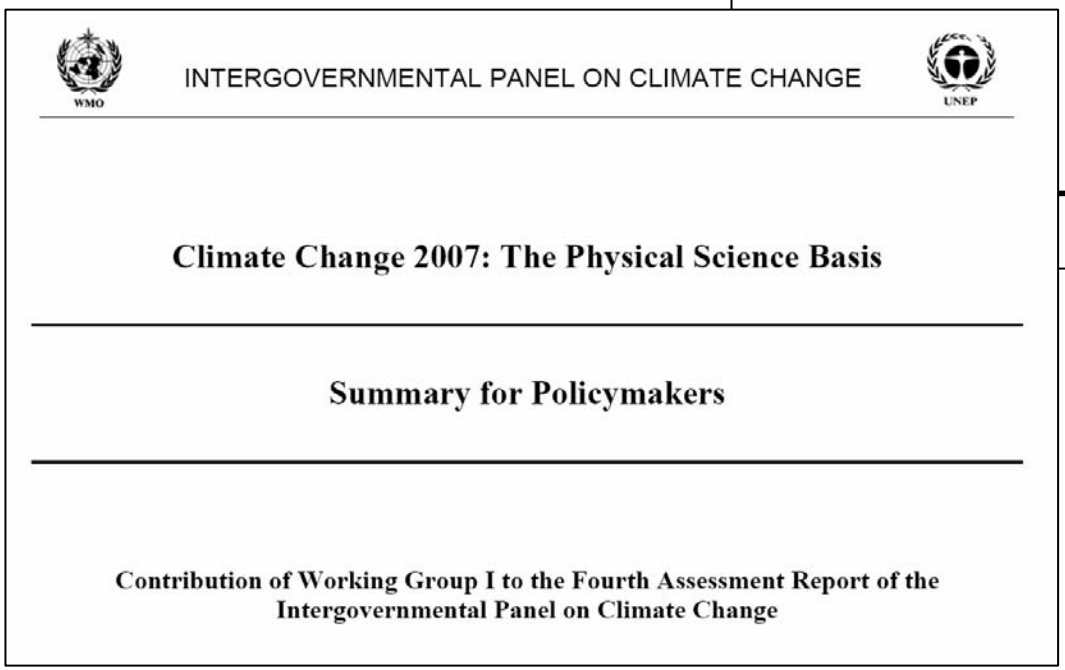
The Science & Its Implications

IPCC '07:

What's available now

February, 2007:


INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE

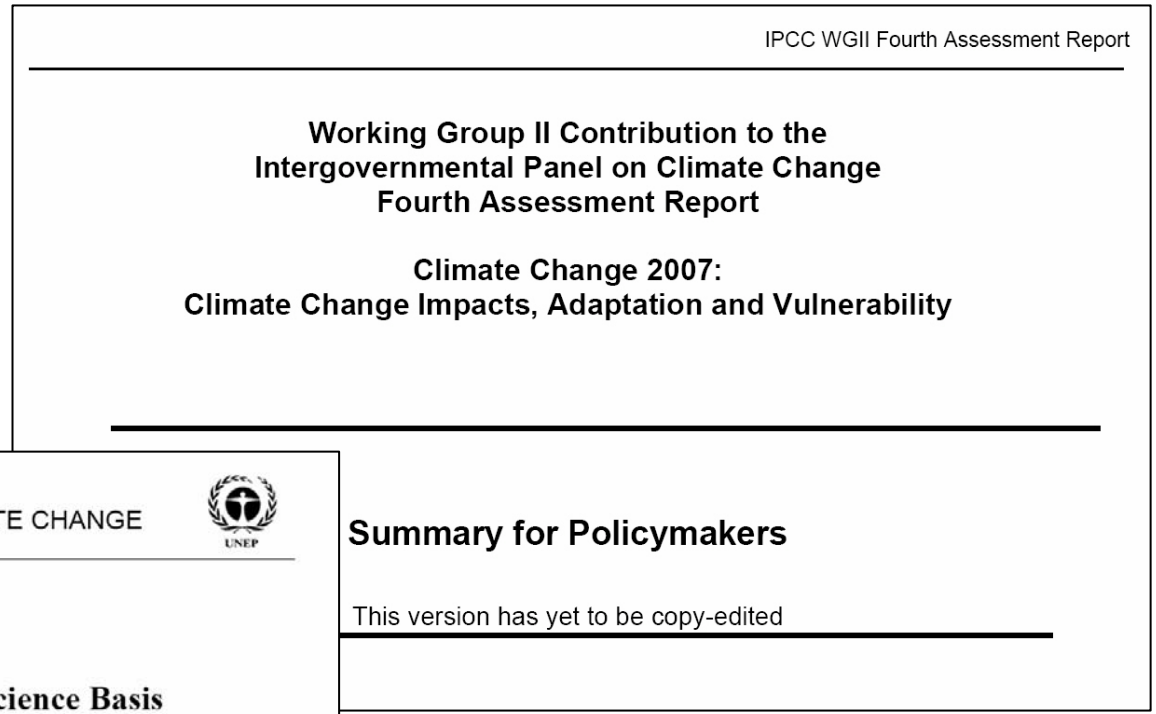
WMO

UNEP

Climate Change 2007: The Physical Science Basis

Summary for Policymakers

Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change


IPCC WGII Fourth Assessment Report

Working Group II Contribution to the Intergovernmental Panel on Climate Change Fourth Assessment Report

Climate Change 2007: Climate Change Impacts, Adaptation and Vulnerability

Summary for Policymakers

This version has yet to be copy-edited

April, 2007

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From TAR to FAR

The FAR includes several meta-level changes:

- Uncertainties are quantified.
  - Numerical probability ranges assigned to likelihood and confidence descriptors ("likely", "high confidence", etc.)
  - More attention is given to ranges of ensemble results.
- Greater emphasis is placed on time scales, particularly multi-decadal change.

There are also changes notably absent:

- None of the previous results has been reversed (and most objections have been answered):
  "Warming of the climate system is unequivocal," "very likely" (90%) due to anthropogenic greenhouse gases
- Florida still doesn't exist

Nonetheless …

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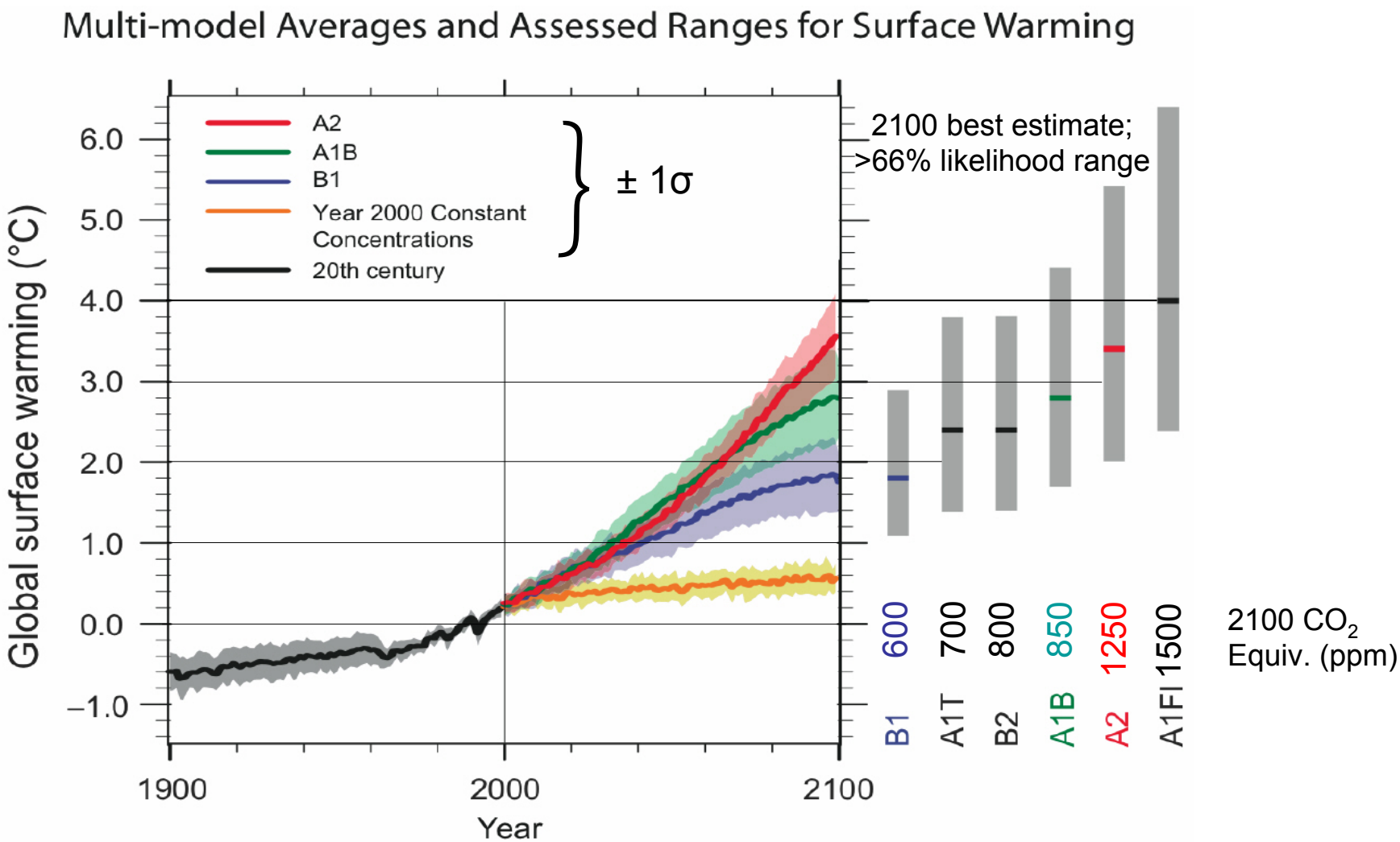
Global Warming



These global/annual averages do not show the whole story.

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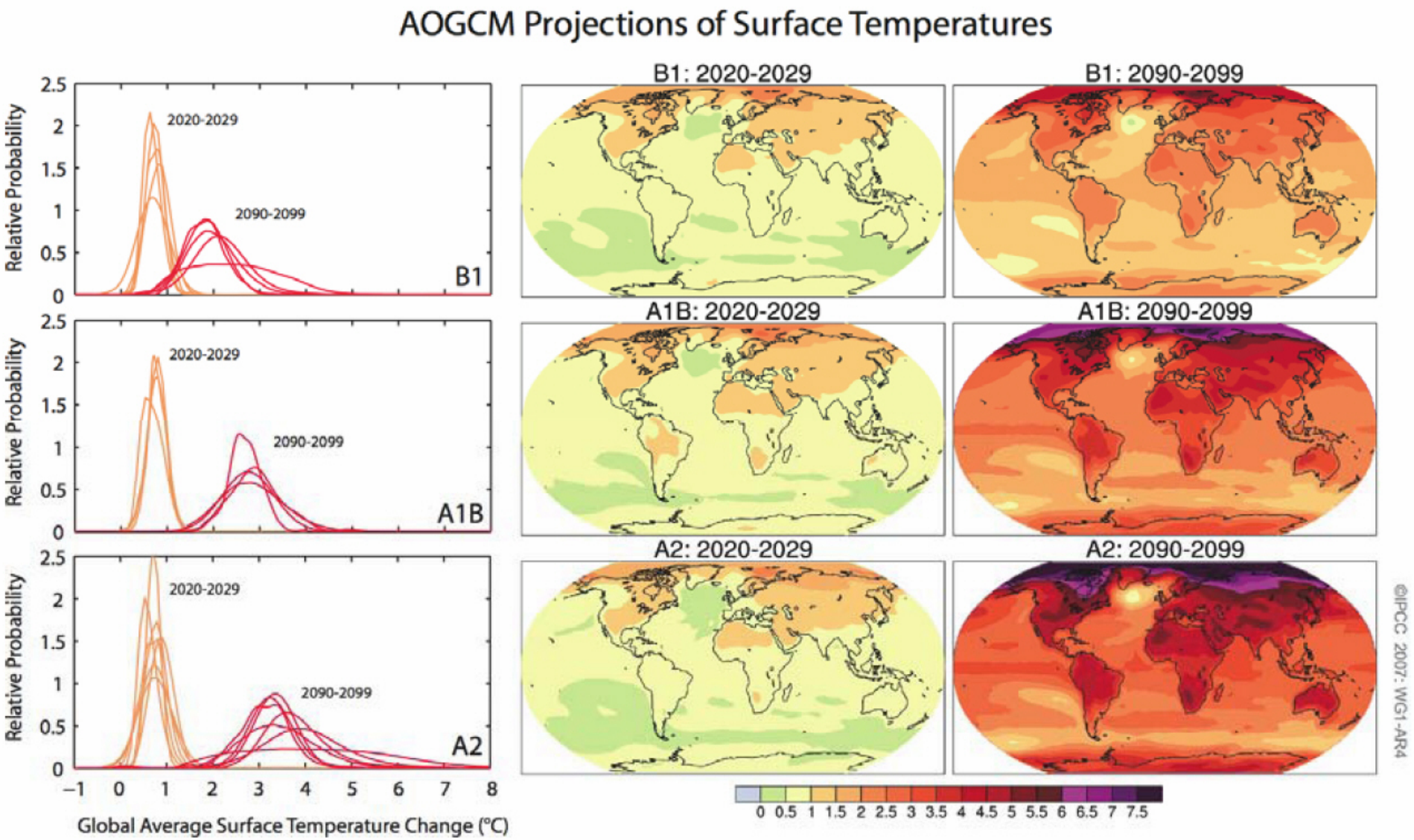
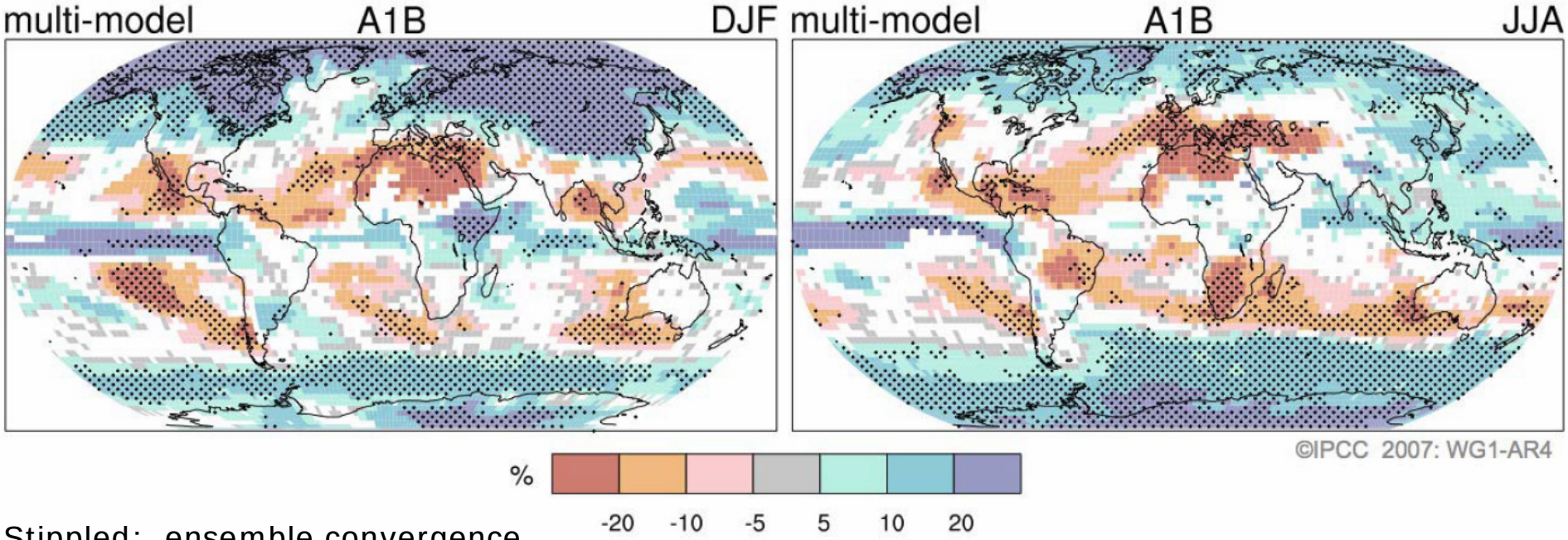
Geographic Variations



Precipitation

Projected Patterns of Precipitation Changes



Stippled: ensemble convergence
White: ensemble divergence

(Weak) Conclusion: Florida will become hotter and drier*.

*Drier in the sense of less water falling from the sky. But...

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Got Snow?

"Current models [of the Greenland Ice Sheet] suggest ice mass losses increase with temperature more rapidly than gains due to precipitation and that the surface mass balance becomes negative at a global average warming (relative to pre-industrial values) in excess of 1.9 to 4.6°C. If a negative surface mass balance were sustained for millennia, that would lead to virtually complete elimination of the Greenland ice sheet and a resulting contribution to sea level rise of about 7 m. The corresponding future temperatures in Greenland are comparable to those inferred for the last interglacial period 125,000 years ago, when paleoclimatic information suggests reductions of polar land ice extent and 4 to 6 m of sea level rise."

IPCC/FAR/SPM1 (2007)

This implies that low-lying areas are vulnerable, and therefore we need consider ...

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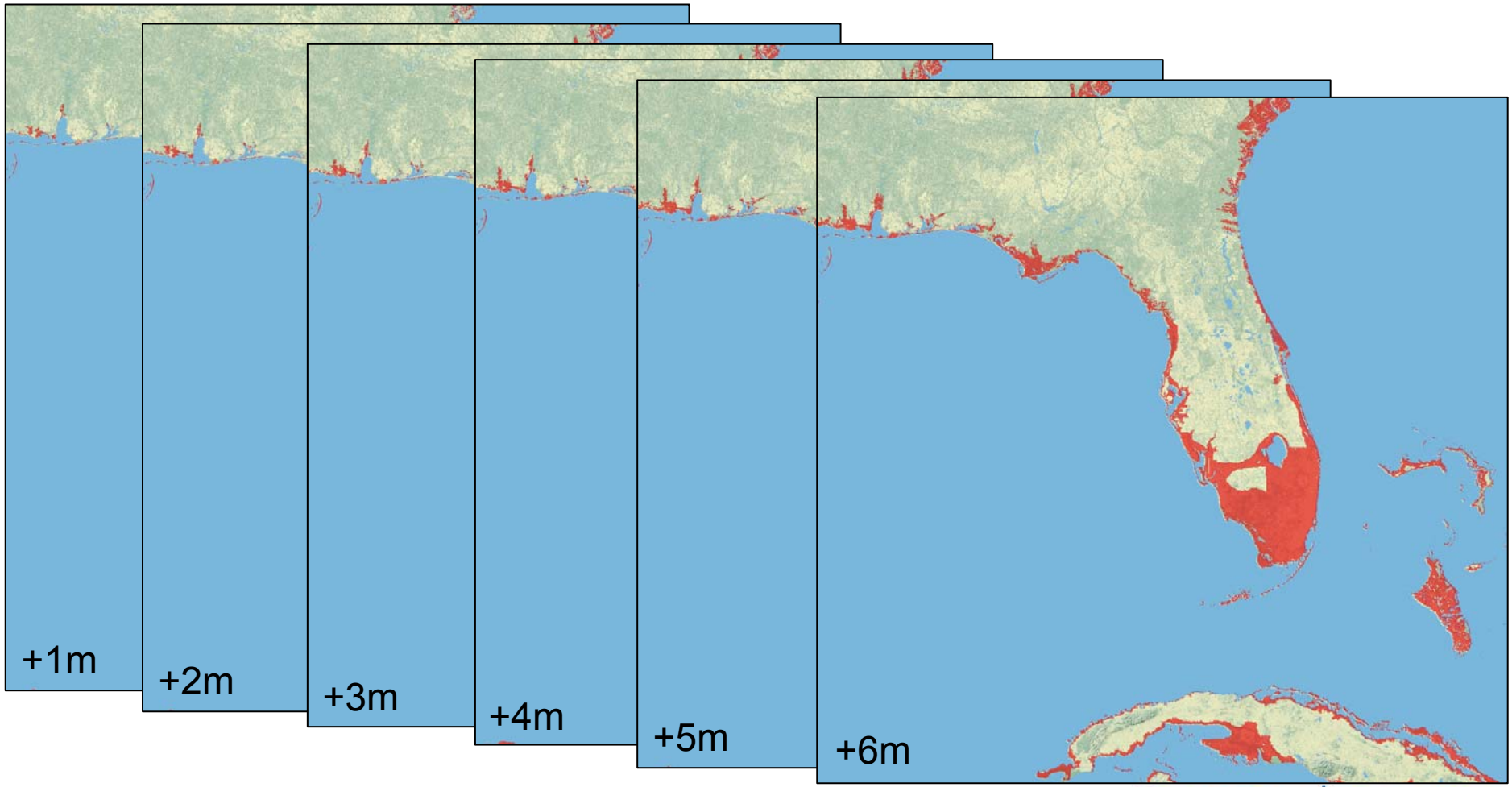
Pool-Table Hydrology

Images from the Center for the Remote Sensing of Ice Sheets (CReSIS), University of Kansas



"Drier" = less rain, more saltwater

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The Implications

Observed impacts:

- Poleward and upward shifts in ranges in plant and animal species (90%)
- Earlier timing of spring events such as leaf-unfolding, bird migrations, egg-laying (90%)
- Warming of lakes and rivers in many regions, with effects on thermal structure and water quality (80%)

Future impacts:

- More frequent coral bleaching events and widespread mortality (90%)
- Coastal exposure to increasing risks; climatic and human pressures compound (90%)
- Coastal wetlands including salt marshes and mangroves negatively affected (90%)
- Coastal flooding, especially in storm-prone areas (90%)
- +/- health effects will vary strongly by region (90%)
- Elderly population at increased risk from heat waves (90%)

Strategies

Develop greater understanding:

… especially on regional level (e.g., this conference)

Adapt & Mitigate:

- Some change is inevitable, so learn to live with it.
- Decide which emissions scenario is possible to adopt and figure out how to wind up there.

e.g., SigmaXi.org:

"Manage the unavoidable, and avoid the unmanageable"

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