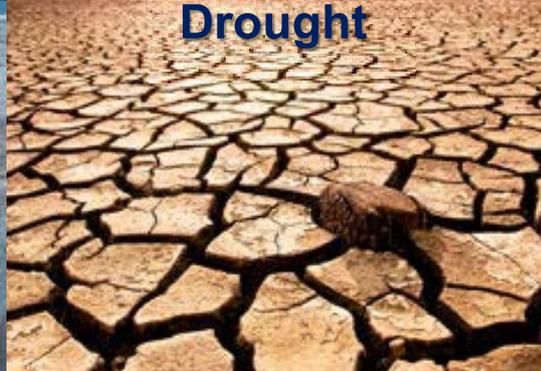
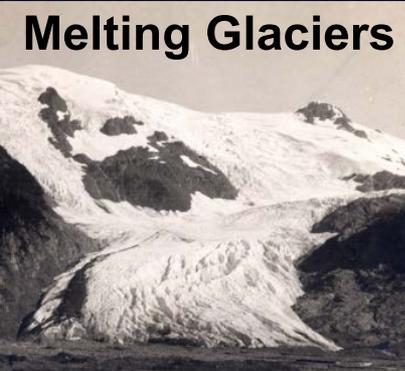




Our Changing Climate From Space A Global Perspective

David Crisp
OCO-2 Science Team Leader
Jet Propulsion Laboratory,
California Institute of Technology
March 27, 2012

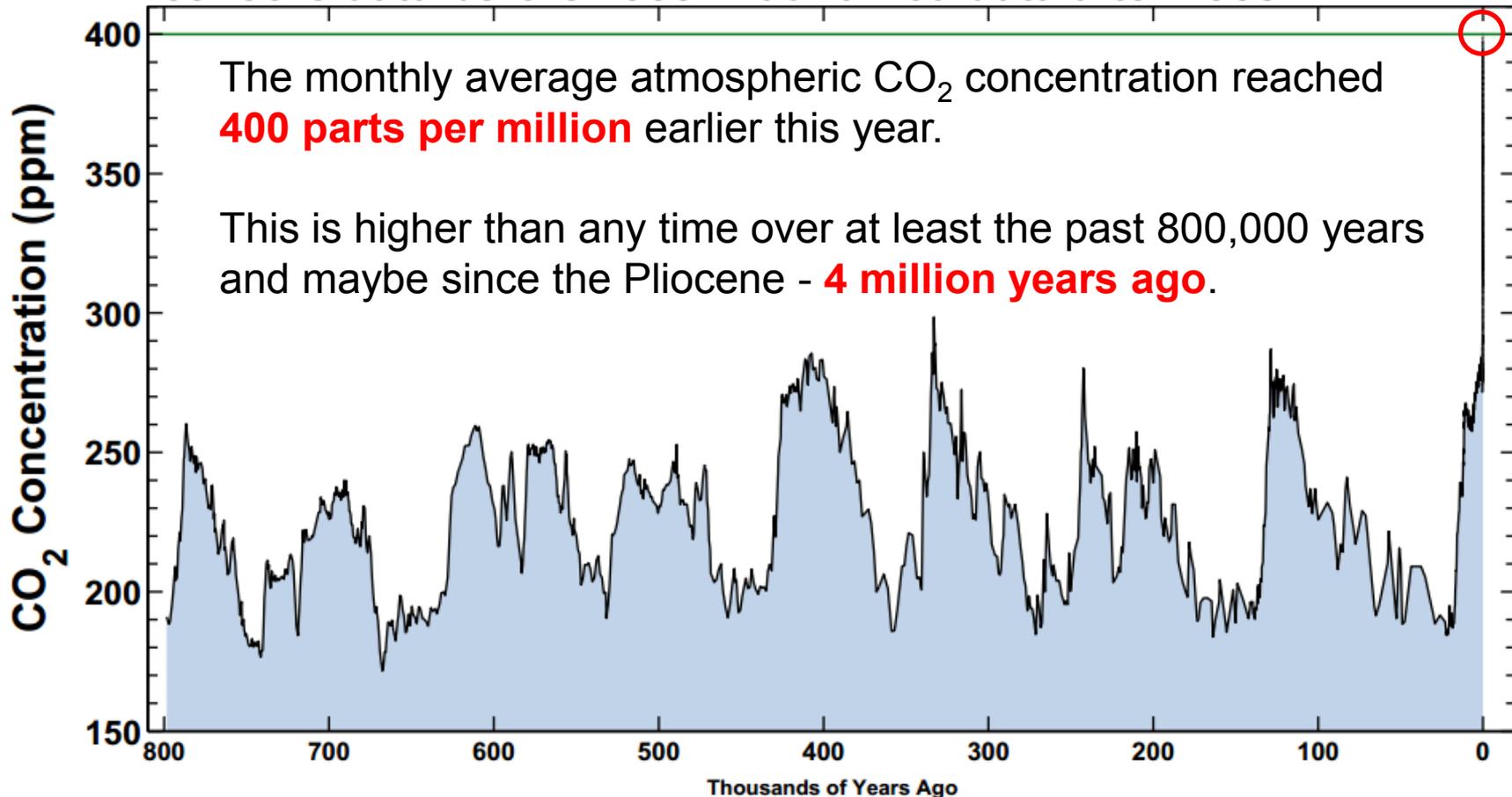
Changes in our Environment



CO₂ and the Global Carbon Cycle

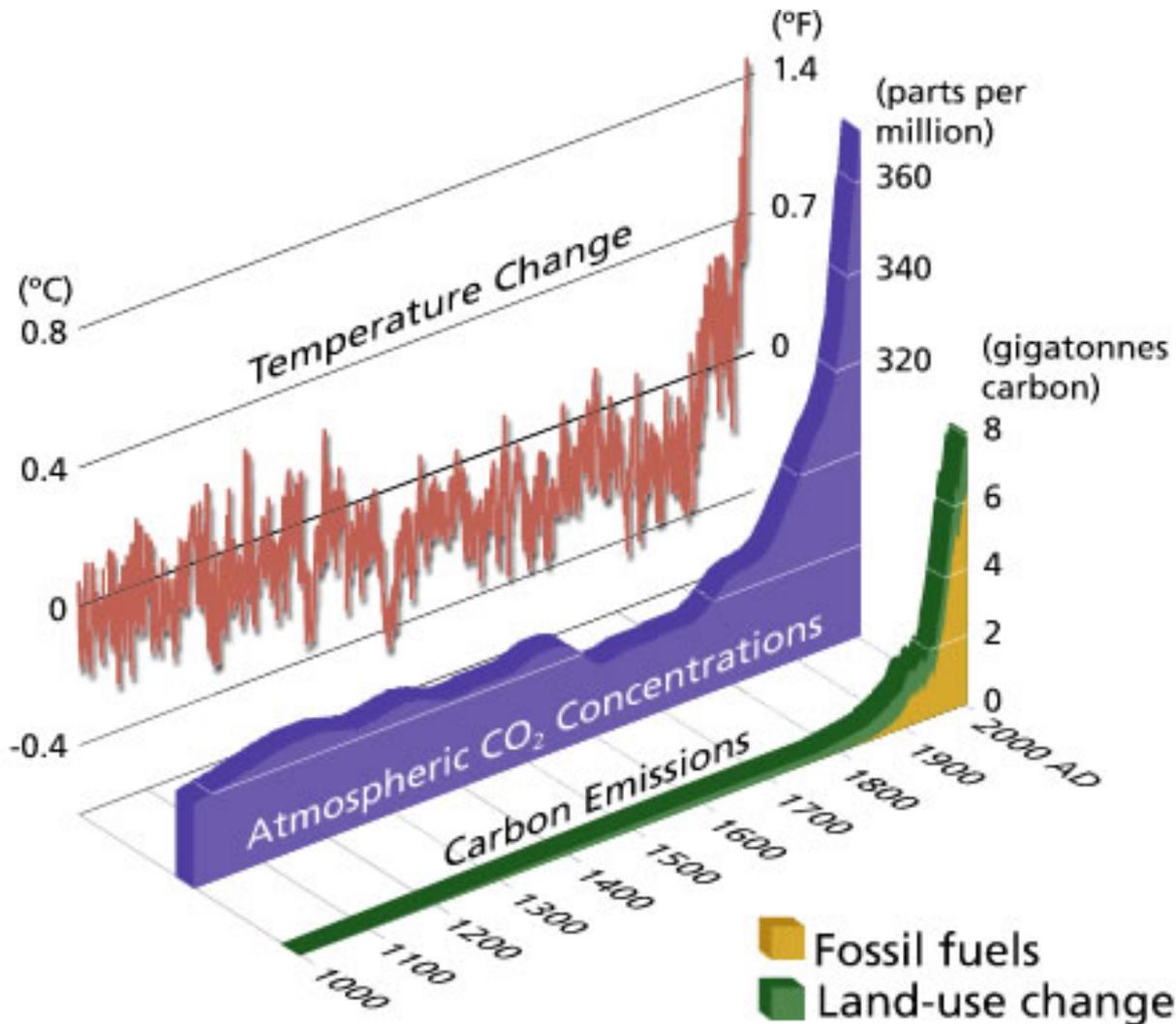


Ice-core data before 1958. Mauna Loa data after 1958.



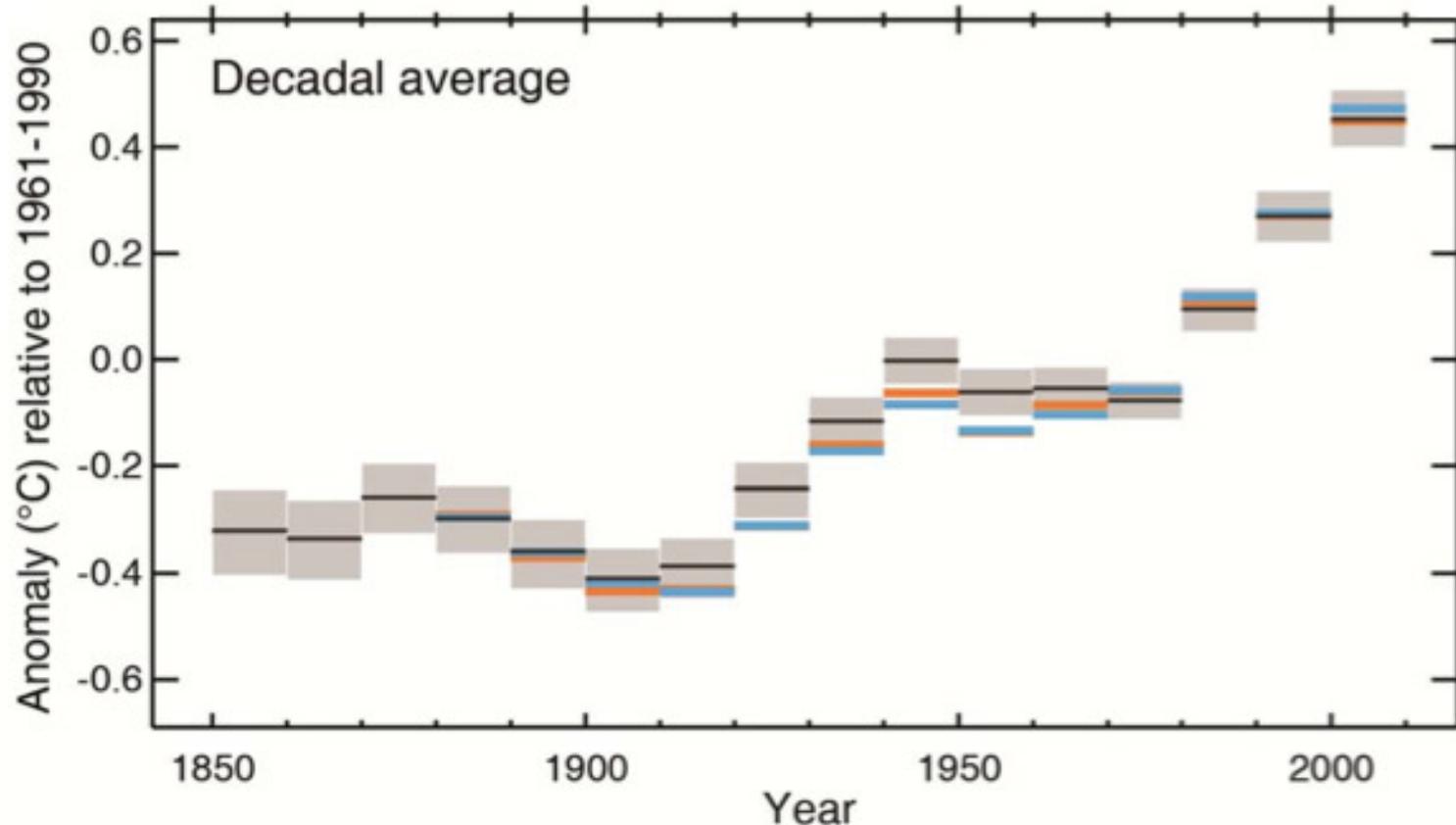
http://bluemoon.ucsd.edu/co2_400/co2_800k.pdf

CO₂ Over the Past 1000 Years



As the carbon emissions and atmospheric CO₂ concentrations have risen, the surface temperatures have followed, more or less as expected.

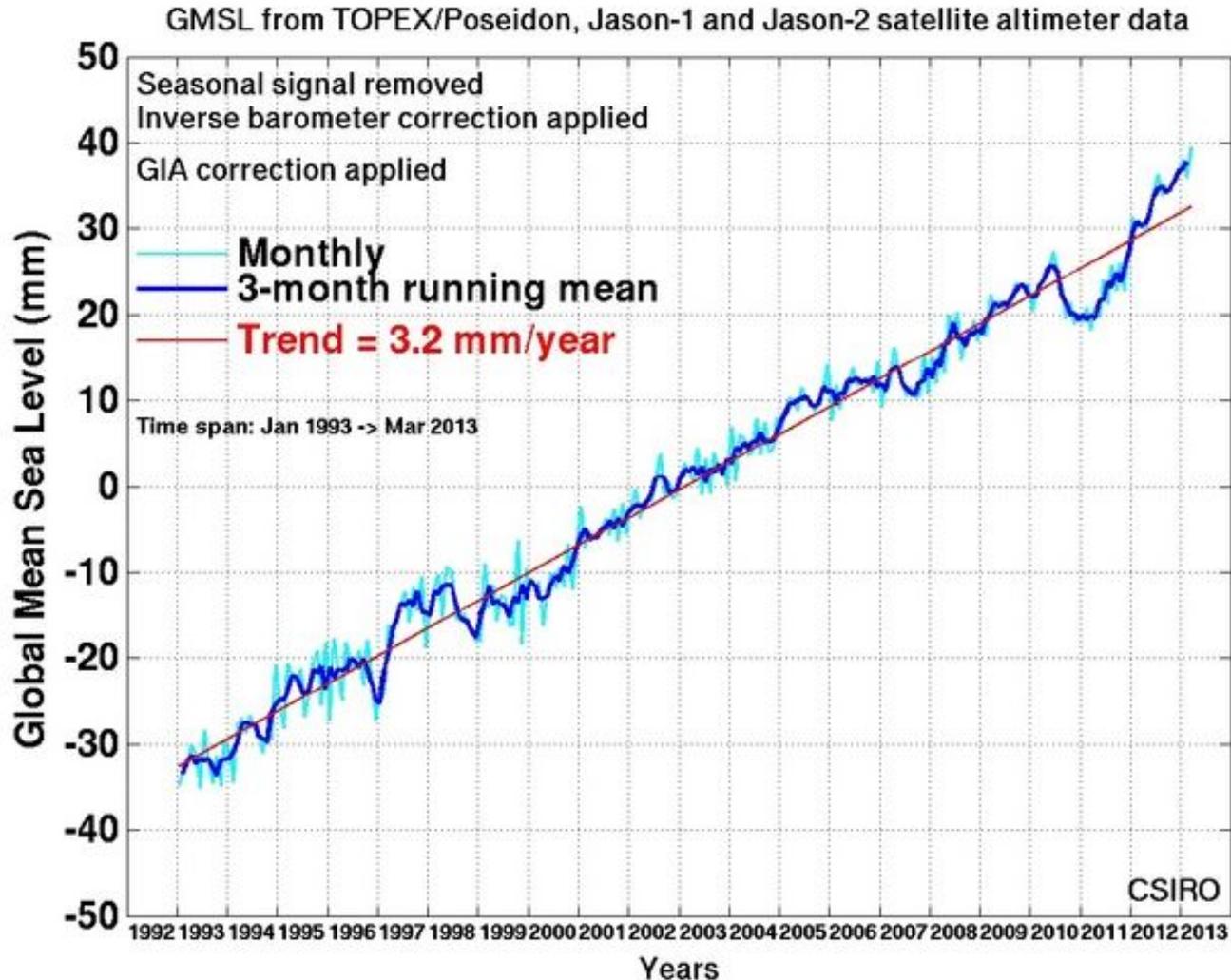
Global Surface Temperatures



In spite of this reduced surface warming, we have just experienced the warmest decade in recorded history.

From IPCC AR5

Where is the Global Warming Going?



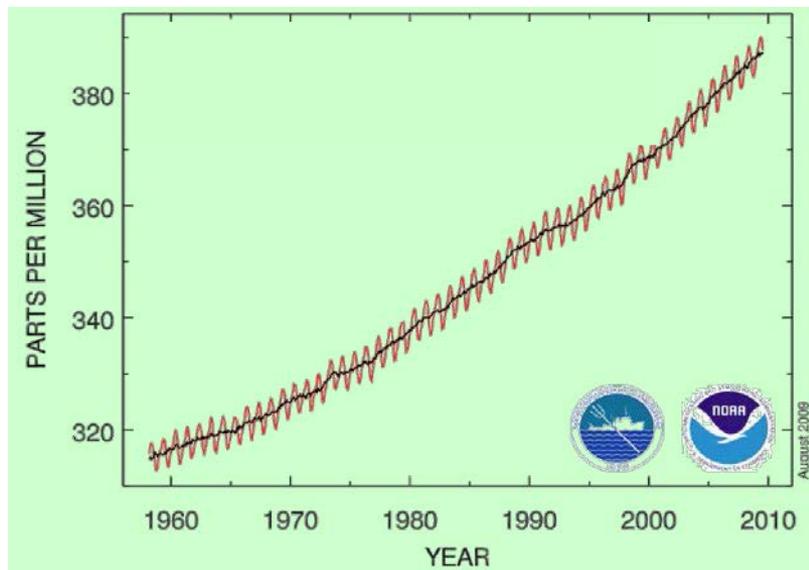
Global Measurements from Space are Essential for Monitoring the Climate



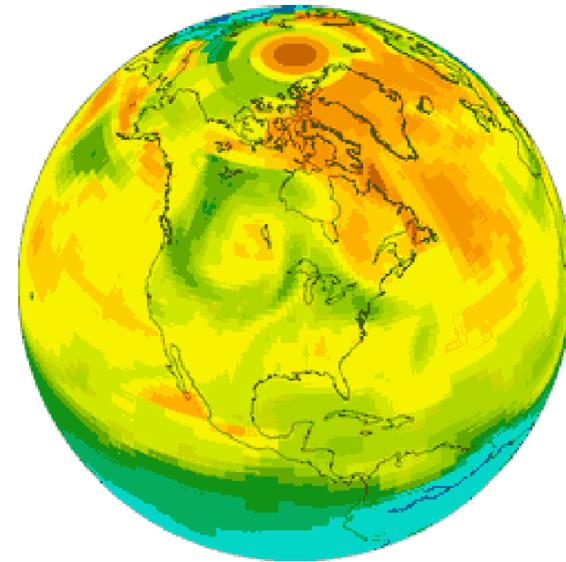
To understand and predict our changing climate, we must

- Monitor human activities that can affect our environment
- Understand how natural processes will respond to these changes

We can only manage what we can measure



Precise ground-based measurements describe global CO₂ trends.



High resolution, space-based measurements are needed to discriminate its sources and sinks.



More Information

- **NASA and its partners are currently operating more than a dozen spacecraft in orbit around the Earth to monitor the health of its climate, and more are under development**
- **You can learn more about these and other NASA Earth Science missions at the web sites:**

<http://climate.nasa.gov/>

and

<http://science.nasa.gov/earth-science/>

Thank you for your attention