

Interactive Climate Simulations to Create Learning Experiences (for Negotiators and the Public)

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Agenda

- Introduction to Climate Interactive
- Demo #1: What if the US...?
- World Climate Exercise
- Demos #2 & 3: What about climate momentum? What about rates of decline?
- Follow-up, Discussion, Conclusion

About Climate Interactive

Climate Interactive's Mission

- To improve the mental models of decision-makers and society as they tackle climate and energy systems
 - Stay apolitical, not get into partisanship
- As a means, Climate Interactive focuses on providing the best trusted, vetted, free, and open tools
 - While we do some analysis upon request, our goal is to empower others to do independent analysis easily, quickly, and in a scientifically rigorous manner.

Climate Interactive Assets

- C-ROADS (Climate Rapid Overview and Decision Support)
 - En-ROADS (Energy Rapid Overview and Decision Support)
- Climate Pathways – iOS application/mobile
- C-Learn – (web-hosted sim based on C-ROADS)
- World Climate (in-person negotiation exercise/war game)
 - Water-Energy Nexus simulator [proposed]
- ClimateScoreboard.org
- Climate Momentum (Flash-based online simulator)
 - Firm-level Electrical Utility model – carbon tax
 - Process facilitation skills

Project Partners

Financial and In-kind Supporters



In-kind Supporters



SEED SYSTEMS
Open Your Path to Sustainability



DEMO 1: WHAT IF THE US...?

C-ROADS Simulator

Climate Rapid Overview and
Decision Support

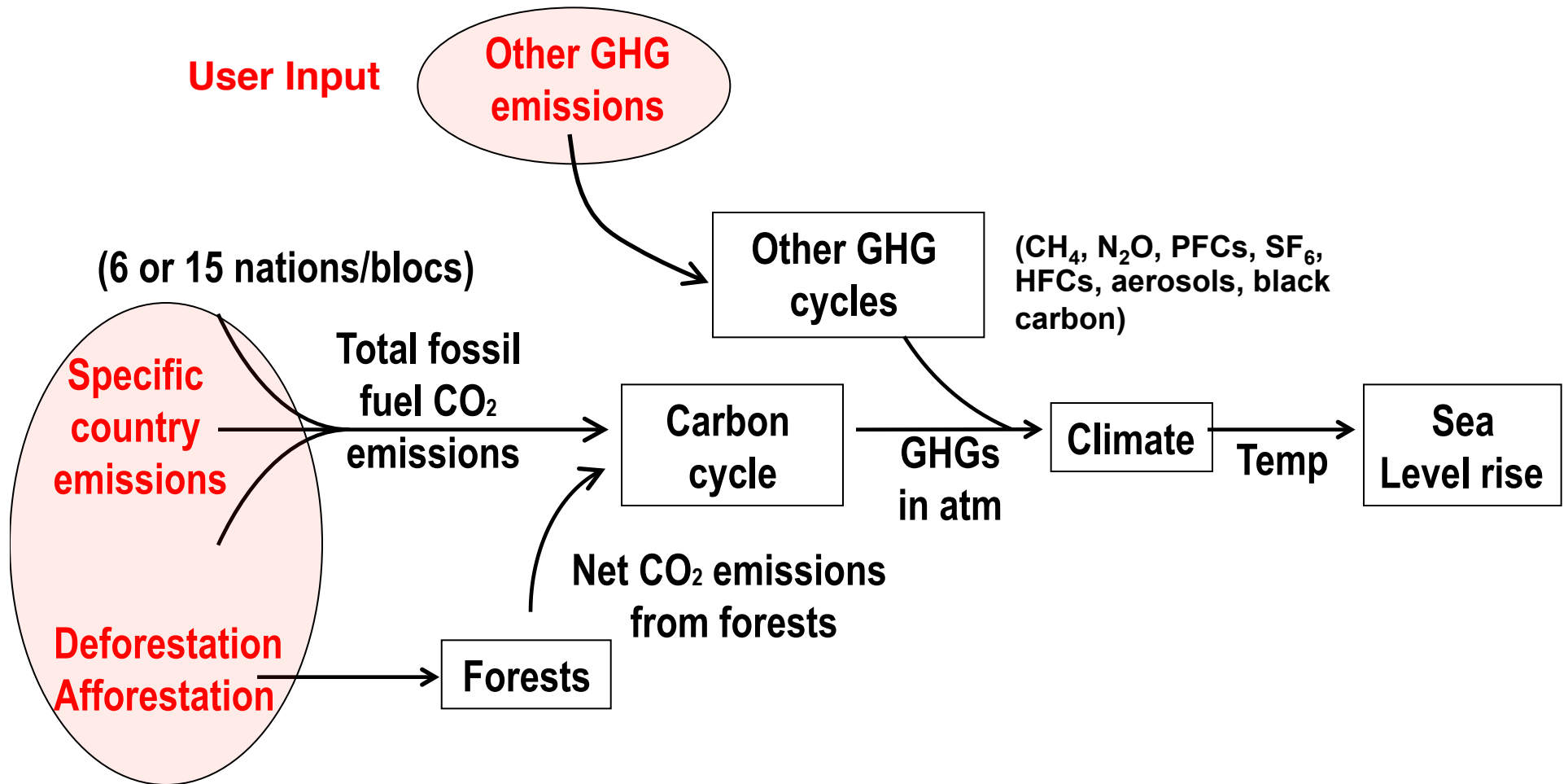
Reach 2°C?

- What will the temperature be in 2100 if:
 - the US reduces 30% below 2005 by 2050
 - the EU reduce 60% below 1990 by 2040
 - China reduces carbon intensity by 60% by 2030
 - and the rest of world continues as projected?

C-ROADS Motivation: Difficulty Comparing Proposals and Estimating Aggregate Impact

- “Currently, in the UNFCCC negotiation process, the concrete **environmental consequences of the various positions are not clear** to all of us. There is a **dangerous void of understanding** of the short and long term impacts of the espoused ...unwillingness to act on behalf of the Parties.”
 - Christiana Figueres, former UNFCCC negotiator for Costa Rica, now Chair UNFCCC, 2009

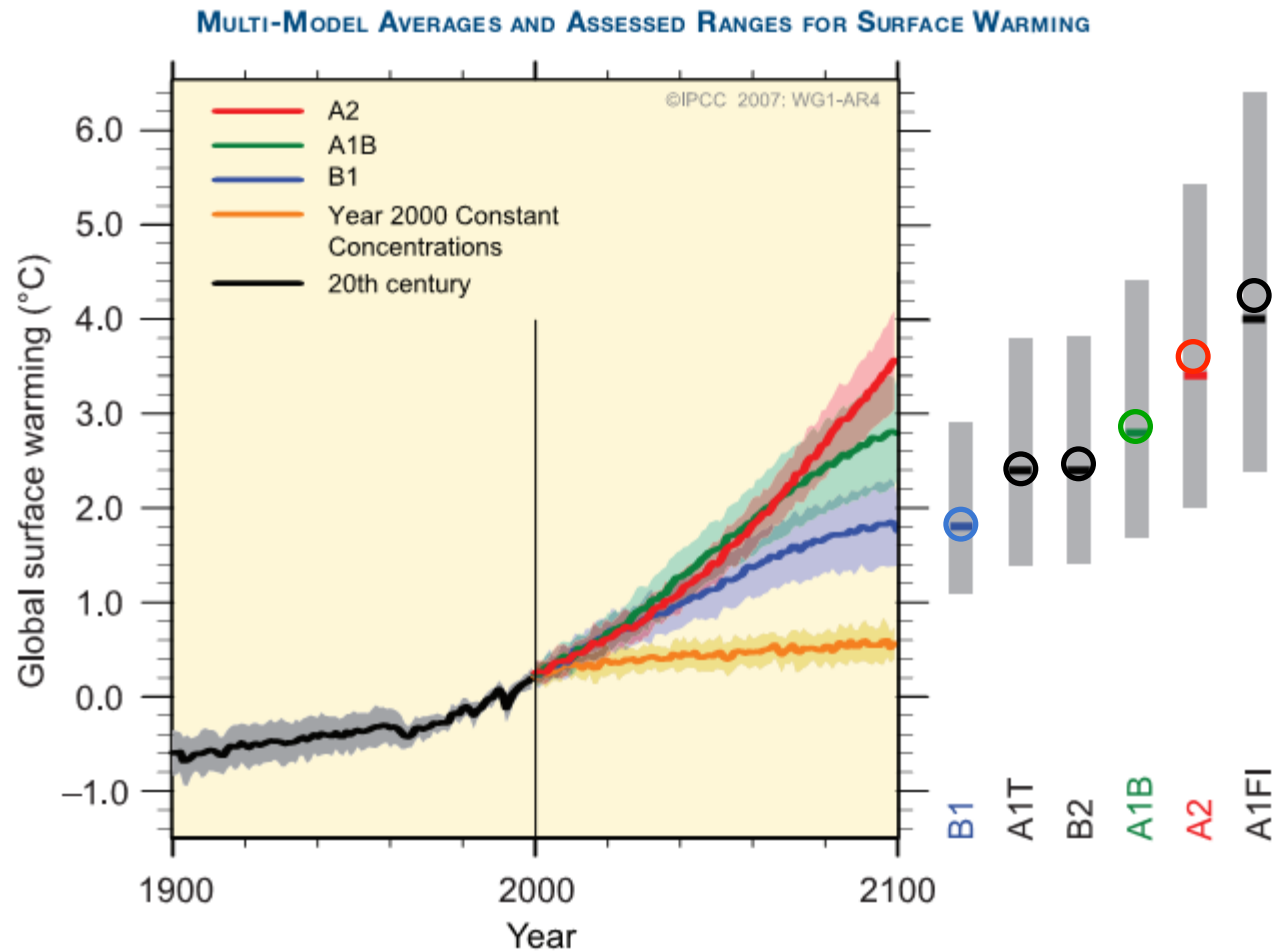
C-ROADS Model Structure



User Input

Scientifically reviewed; Runs easily on a laptop;
Emerges from team out of MIT; Shared with all groups
(e.g., US, EU, China, NGOs);
Open-box: equations and assumptions transparent

C-ROADS Calibration to AR4 Scenarios



Scientifically rigorous AND useful to decision-makers



**Dr. Robert Watson,
Past Chair, IPCC**

“C-ROADS... This very rapid simulation model reproduces the response properties of state-of-the-art three dimensional climate models very well ... and with sufficient precision to provide useful information for its intended audience.”



Senator John Kerry

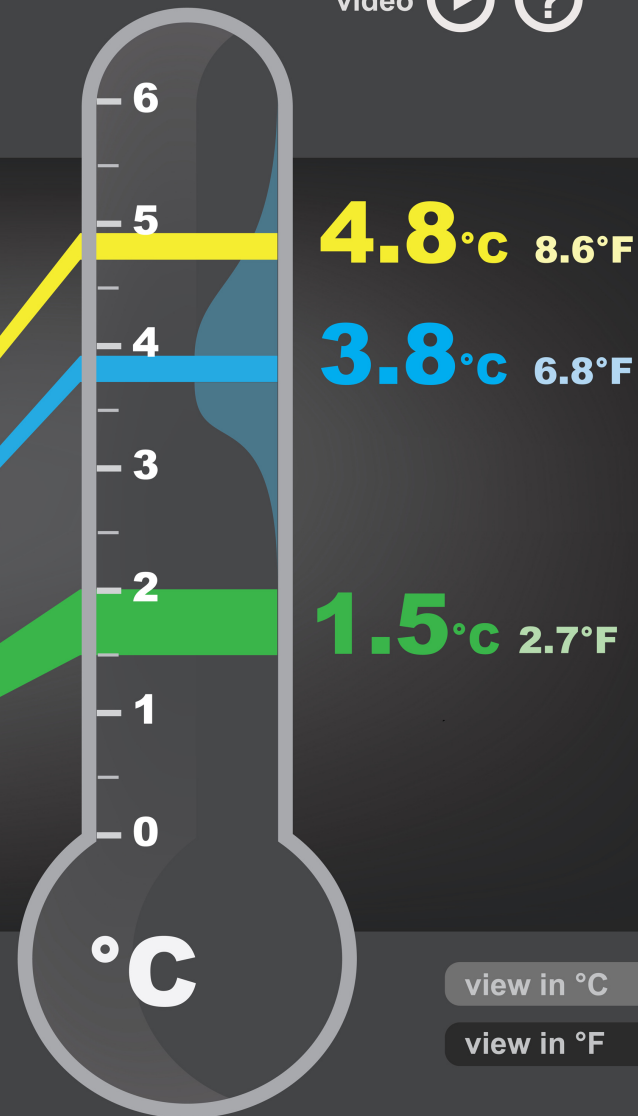
“I have to tell you — [C-ROADS] works, it is important, and it is already getting broad dissemination, ... I used it!”

Demo #1: Overview of C-ROADS

Increase in Global Temperature by 2100

Where will proposals from the climate negotiations lead?

business as usual
Dec 1 proposals
goals



view in °C

view in °F

China- 20% reduction of energy consumption per unit GDP by 2010;

World Climate

- Negotiation exercise for a group of people
- Goal: To come to an agreement that keeps the world below 2deg C
- Three (or six) country groups have three different rounds of negotiations to decide emission targets and an adaptation fund
- Uses C-ROADS to scientifically ground the educational experience
- Country Briefings and supporting model is available online

With MIT, We Developed Interactive Policy Exercises Engaging Diverse Leaders

Oil Executives at MIT



European Business Leaders in Greenland



European Environmental Officials in Copenhagen



Corporate Executives with The Climate Group



Duke MBAs



Plus:

- Citizen leaders in NH
- Civic leaders in Atlanta
- Society for Organizational Learning leaders

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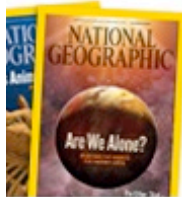
www.climateinteractive.org



Demo #2: Climate Momentum?

Demo #3:

What about rates of decarbonization?



Current Issue
November 2009
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NATIONAL GEOGRAPHIC

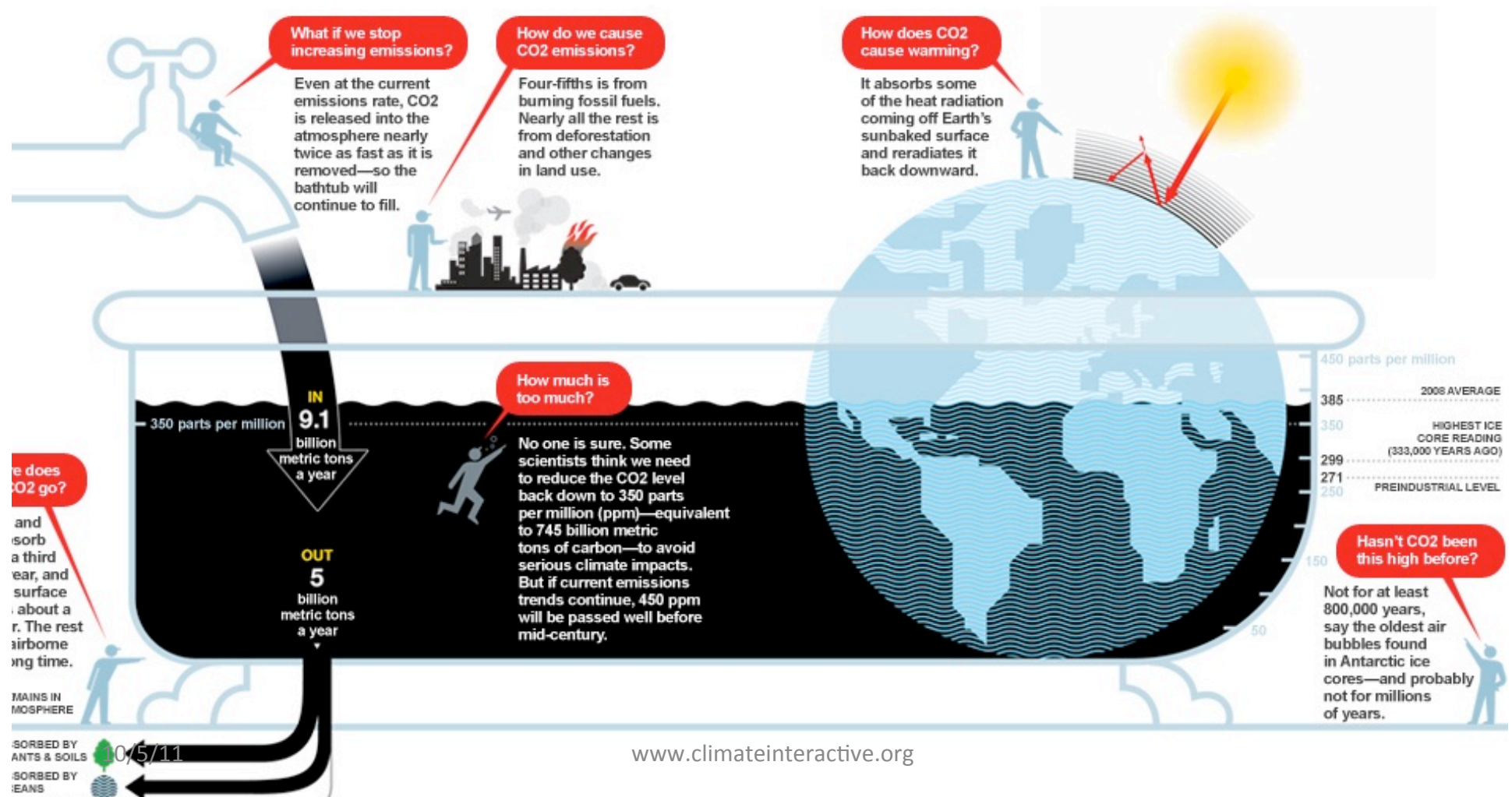
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Big Idea

December 2009



International Herald Tribune

SATURDAY-SUNDAY, DECEMBER 19-20, 2009

THE GLOBAL EDITION OF THE NEW YORK TIMES

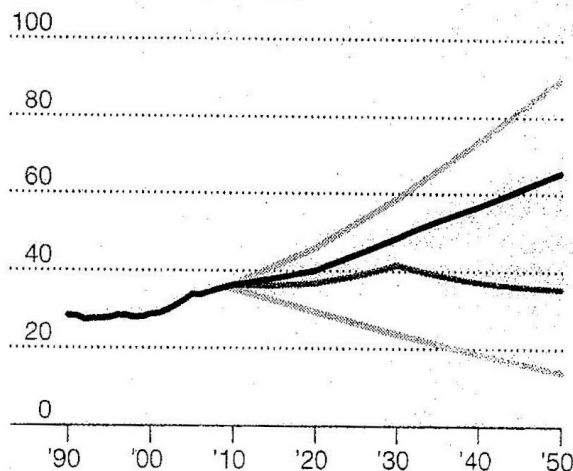
GLOBAL.NYTIMES.COM

Will it be enough?

The chart shows the estimated impact of proposals put on the table by major countries in Copenhagen. "Business as usual" is what the Intergovernmental Panel on Climate Change believes will happen if no effort is made to curb emissions. Confirmed proposals are official pledges, while potential proposals include reductions merely under consideration as well as those with conditions. The low-emissions path is roughly the amount of reductions scientists say are necessary to limit the rise in global temperatures to acceptable levels. A substantial gap remains between that level and what has been proposed so far.

Global emissions of CO₂

In billions of tons, annually



Source: Climate Interactive's Climate Scoreboard

Atmospheric CO₂ in 2050

In parts per million

CO₂ CO₂ equivalent

Temperature increase*

"Business as usual"	965	1,410	4.8° C (2.9° - 7.7°)
Confirmed proposals	755	990	3.8° C (2.3° - 6.1°)
Potential proposals	590	725	2.9° C (1.8° - 4.7°)
Low-emissions path†	450	505	1.9° C (1.1° - 3.0°)

*Increase over preindustrial levels in 2100. †Meant to limit the rise in global temperatures to less than 2 degrees Celsius through a 50% reduction in and stabilizing of emissions by 2050.

Note: All proposals are as of Tuesday.

New England Science Museums



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Thank You

**For more information:
www.ClimateInteractive.org**

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