

Seasons of Change:
National Security, Energy and the Future
of Virginia's Hampton Roads.

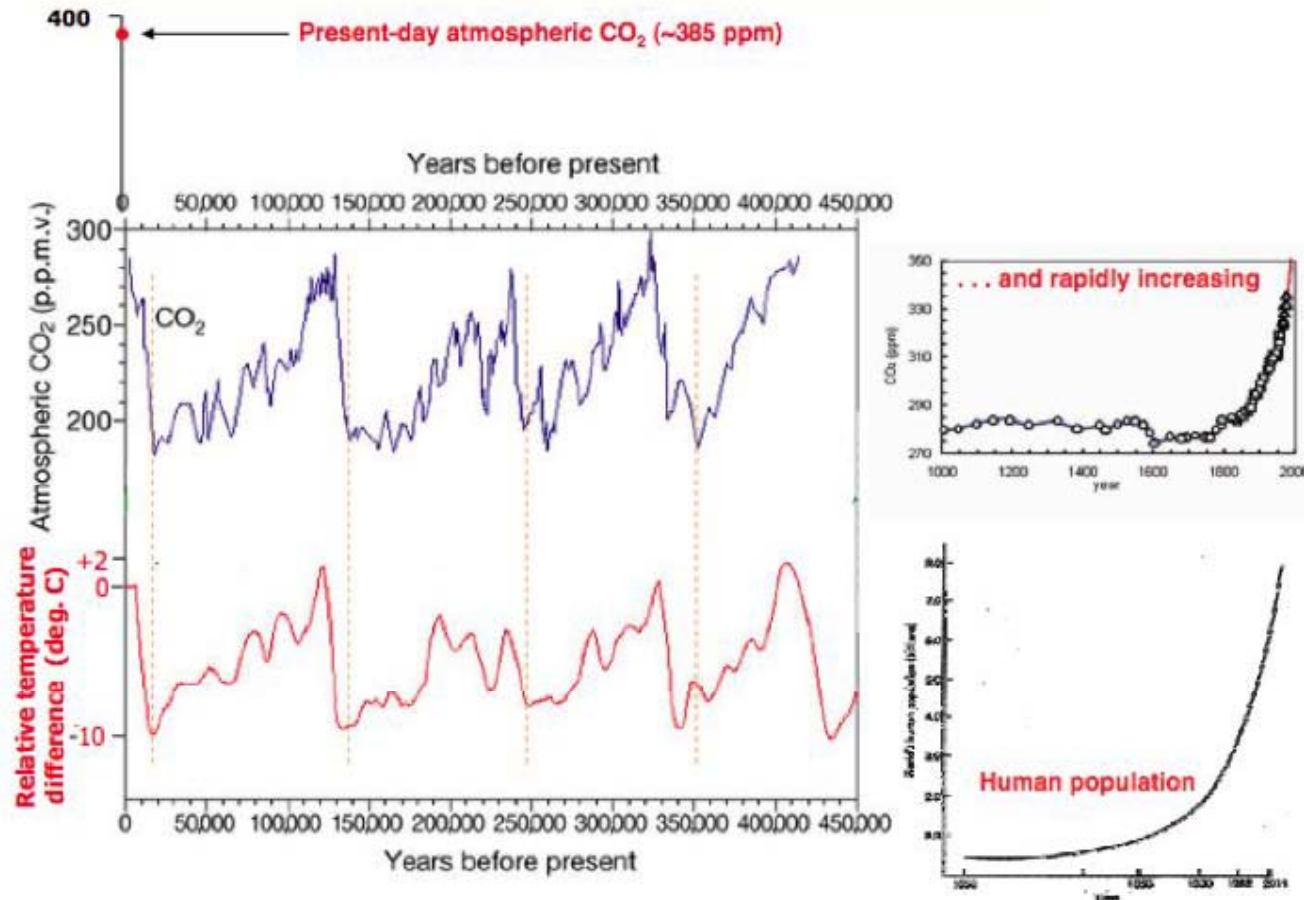
Dimensions of the Challenge

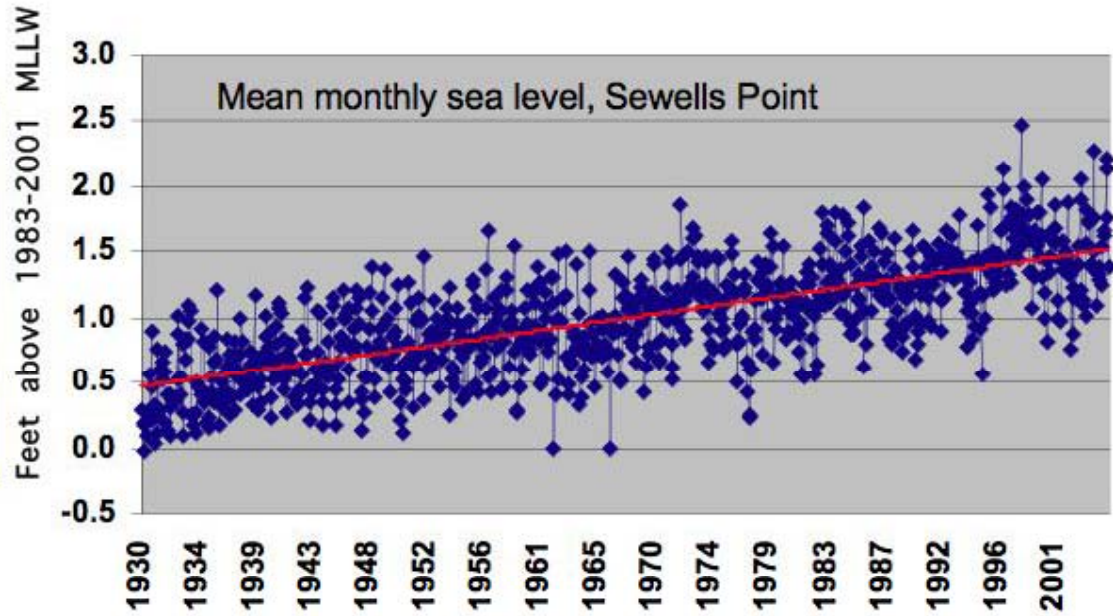
Roger Mann

Director for Research and Advisory Service

Virginia Institute of Marine Science

Ice Core Records (Antarctica) record changes in Earth's climate



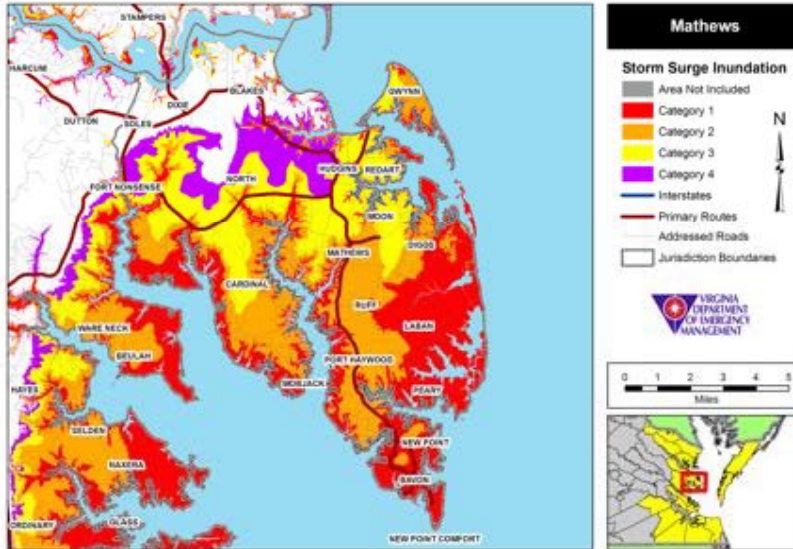




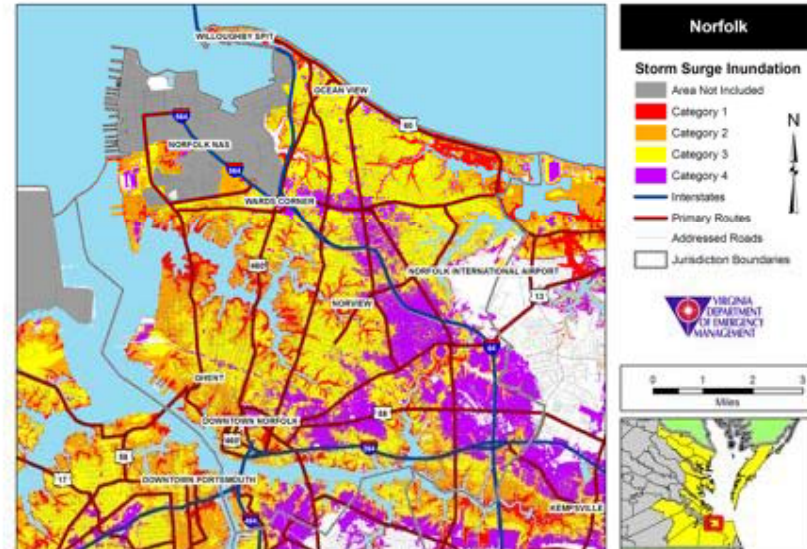
The news wire....

- Washington Post, September 24, 2009
- **Scientists: Planet to Warm by More Than 7 Degrees This Century** (even if the world's leaders fulfill their most ambitious climate pledges, United Nations Environment Program).
- U.K. weather service, October 5, 2009.
- **Average warming could be by 4 degrees Celsius (6 degrees Fahrenheit) by 2055 -- U.K. weather service (October 5, 2009)**
- SCIENCE, October 6, 2009.
- **Moderate GHG cuts could ward off catastrophic climate damage.** Morton Webster at Massachusetts Institute of Technology. Limiting Earth's total temperature rise to roughly 2 degrees Celsius means those emissions cuts would have to start soon. While many equate staying under the 2-degree "climate guardrail" to stabilizing the concentration of atmospheric carbon dioxide at 450 parts per million, Webster says that's faulty reasoning.

Commonwealth of Virginia Storm Surge Inundation Maps



Commonwealth of Virginia Storm Surge Inundation Maps



Climate change is the challenge of our generation

- It is not a local, regional or global problem, it is all of them.
- It is not a partisan issue - we need bipartisan leadership.
- It encompasses social through economic to national security issues.
- The time frame for action is immediate.
- Data integrity - duration and intensity to both drive and calibrate predictive models.
- Communication - open and frank conversations with end users guiding adaptive and mitigating efforts, education, policy and planning.

