

*Business, Education, and
Research Opportunities in
Marine Affairs and Ocean
Sciences: From the Local to
the Global Perspective*

Climate Change Legislation

State: Rhode Island

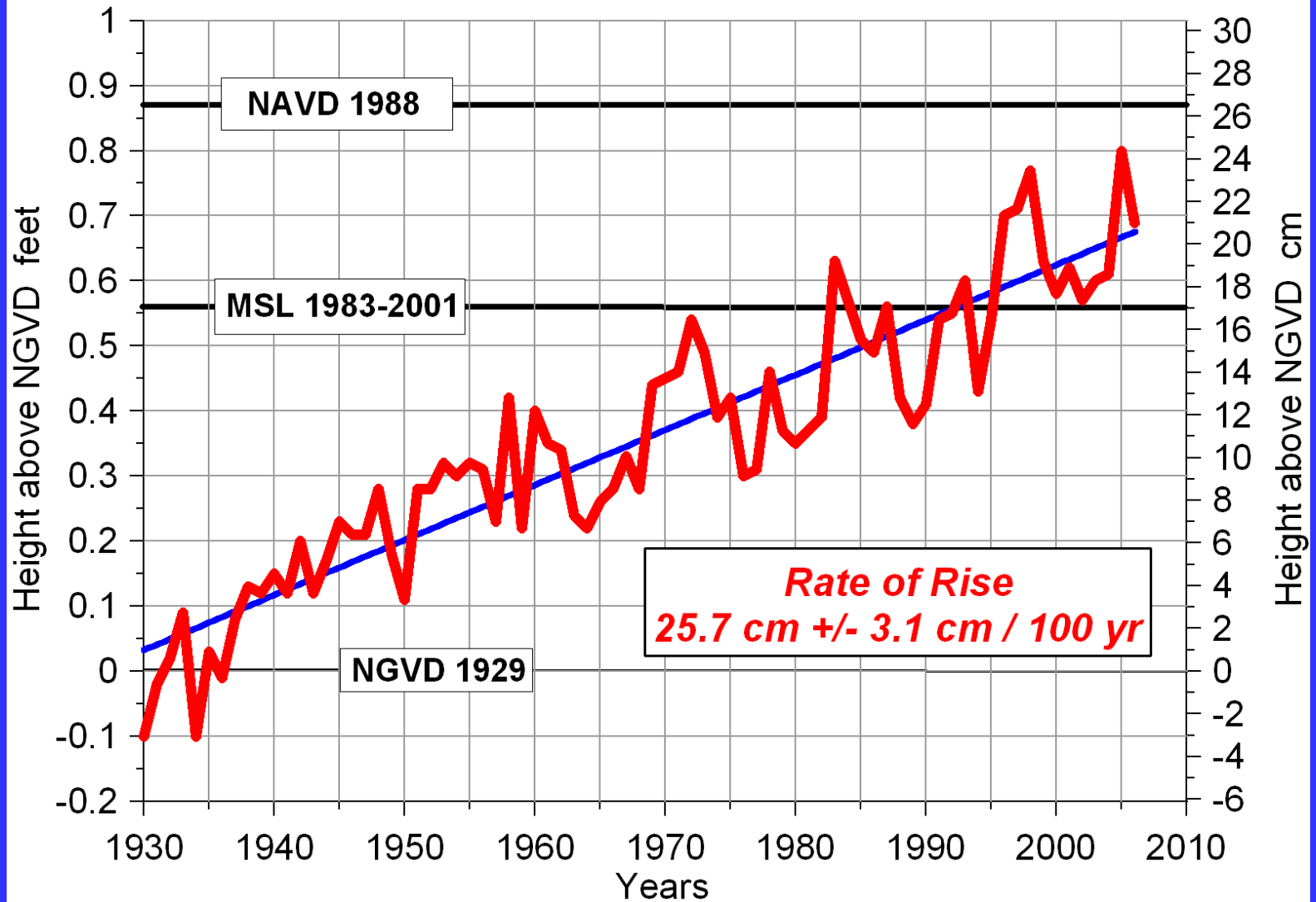
Federal: Warner-Lieberman

Climate Change Impacts: Rhode Island

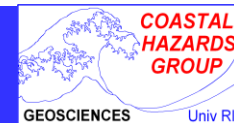
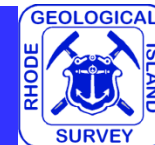
Narragansett Bay 1955-2005

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

HISTORIC SEA-LEVEL RISE - Newport, RI

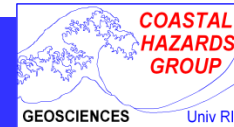
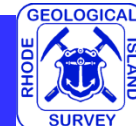
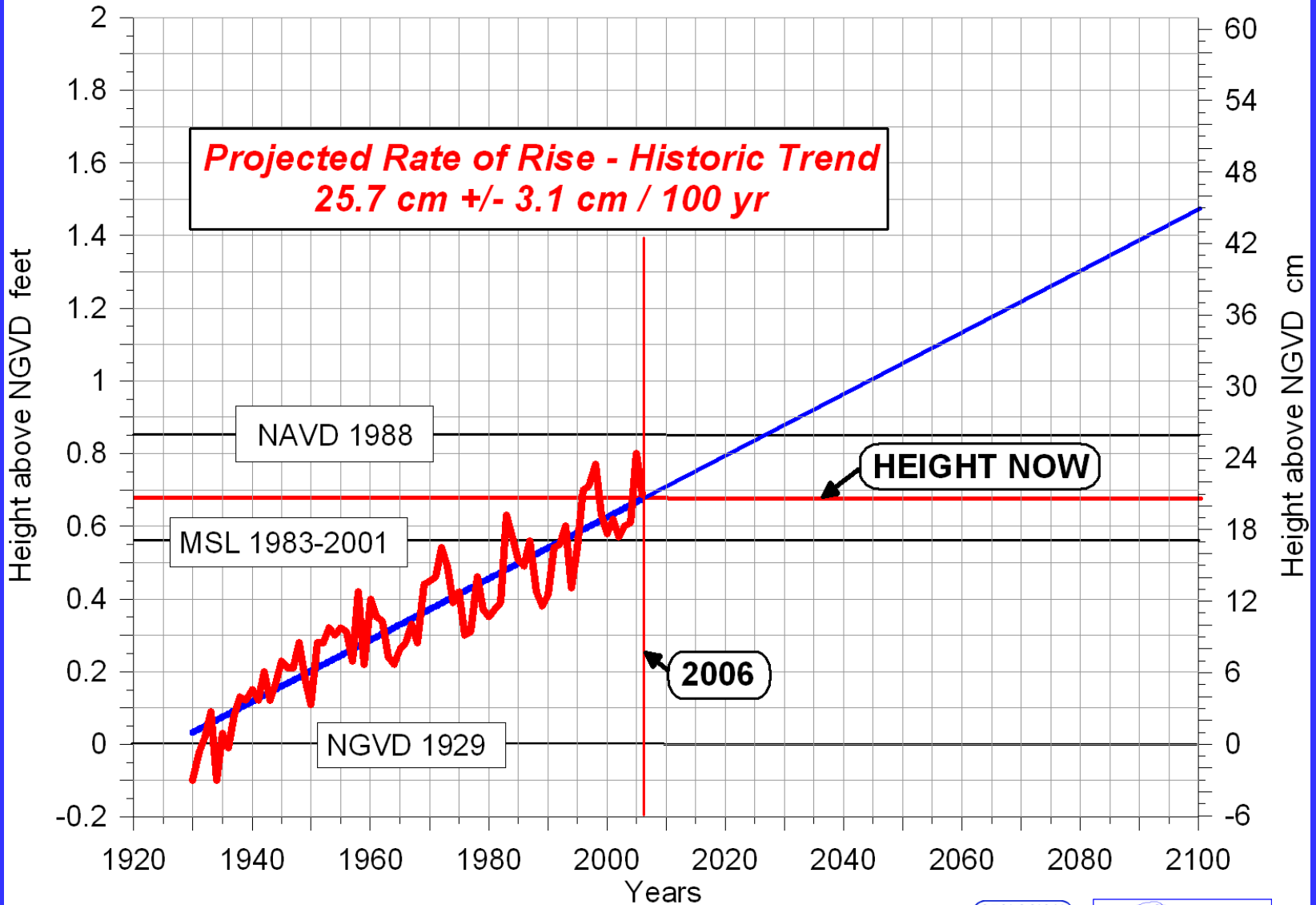


adapted from <http://www.coops.nos.noaa.gov/sltrends>

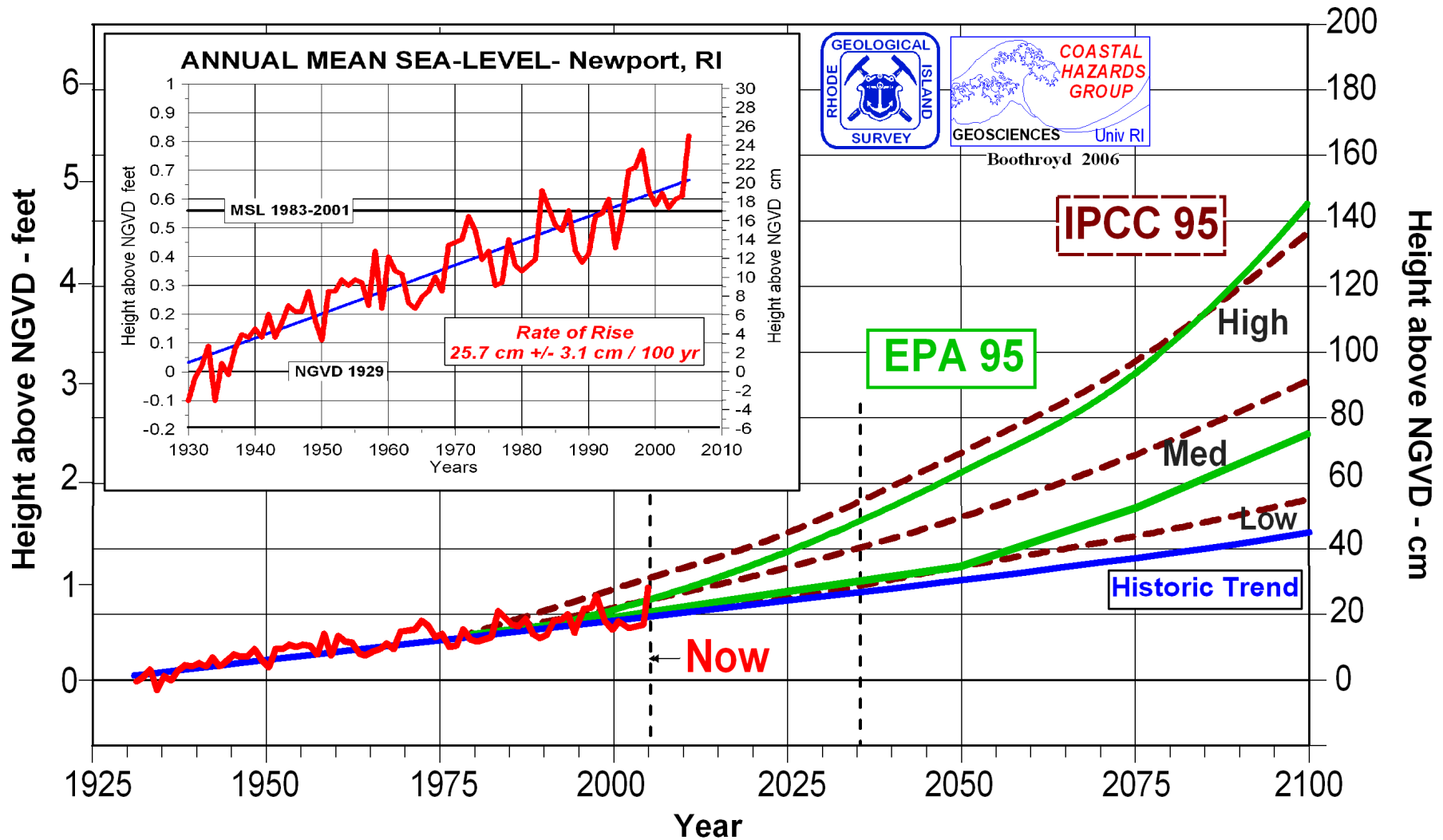


Boothroyd 2006

PROJECTED SEA-LEVEL RISE - Newport, RI



ACCELERATED SEA-LEVEL RISE at NEWPORT, RI

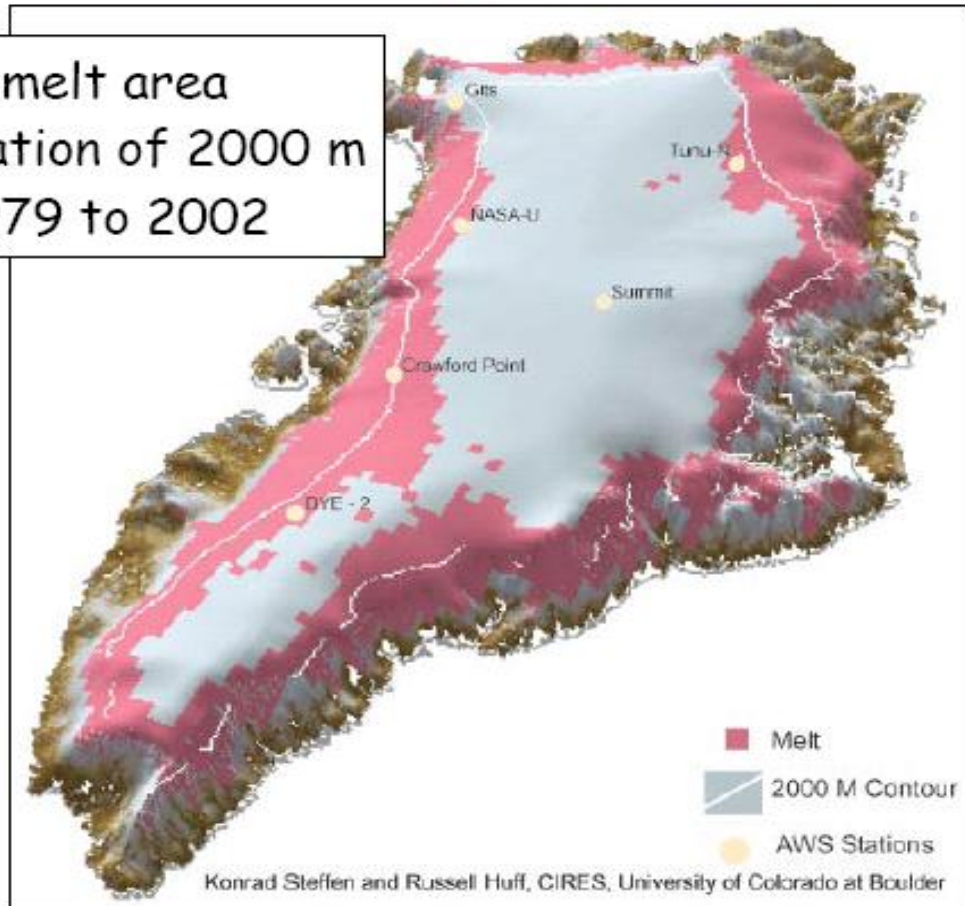


Increasing Freshwater Runoff and Glacial Discharge from Greenland.

Current Greenland Summer Melt

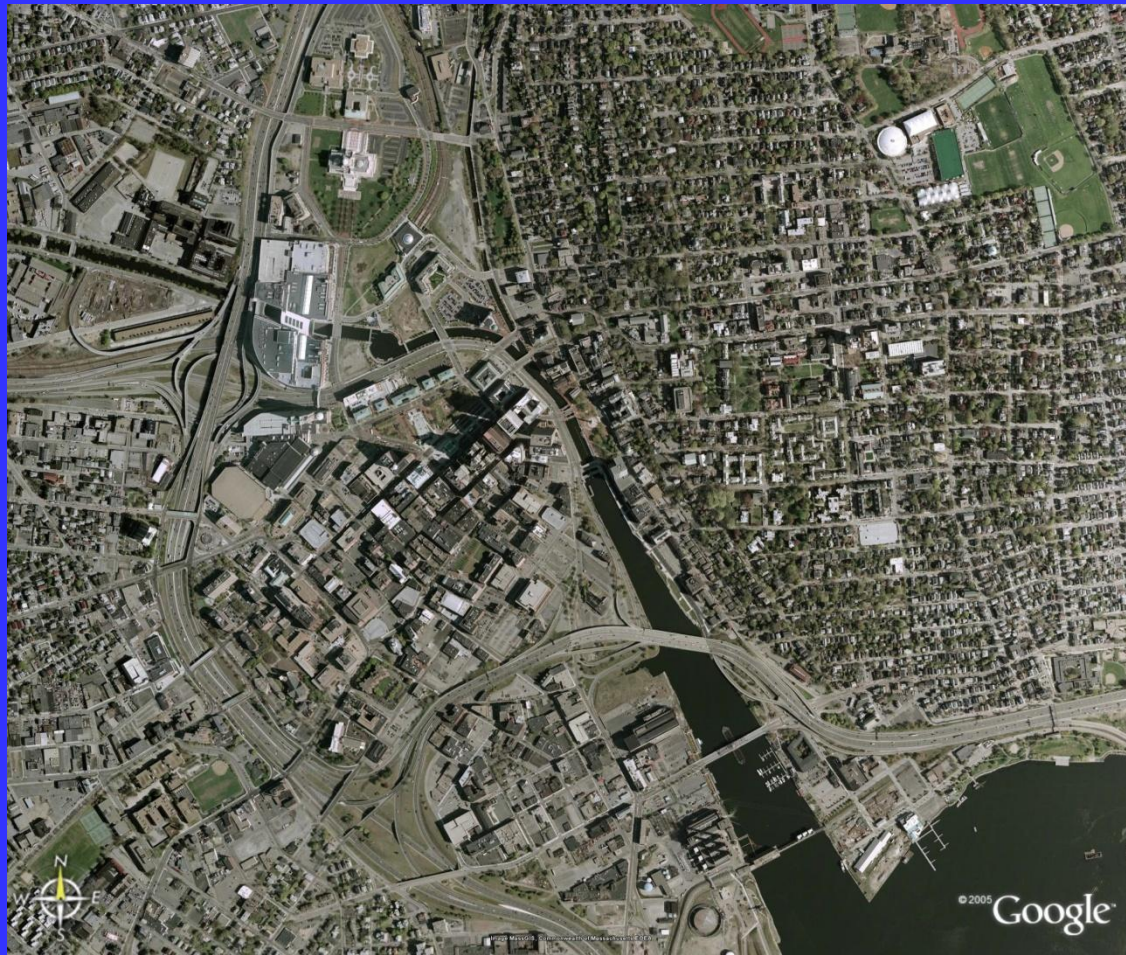
- 2002 all-time record melt area
- Melting up to an elevation of 2000 m
- 16% increase from 1979 to 2002

130,000 years ago, Greenland may have melted by **2/3rds** in **500 years or less**



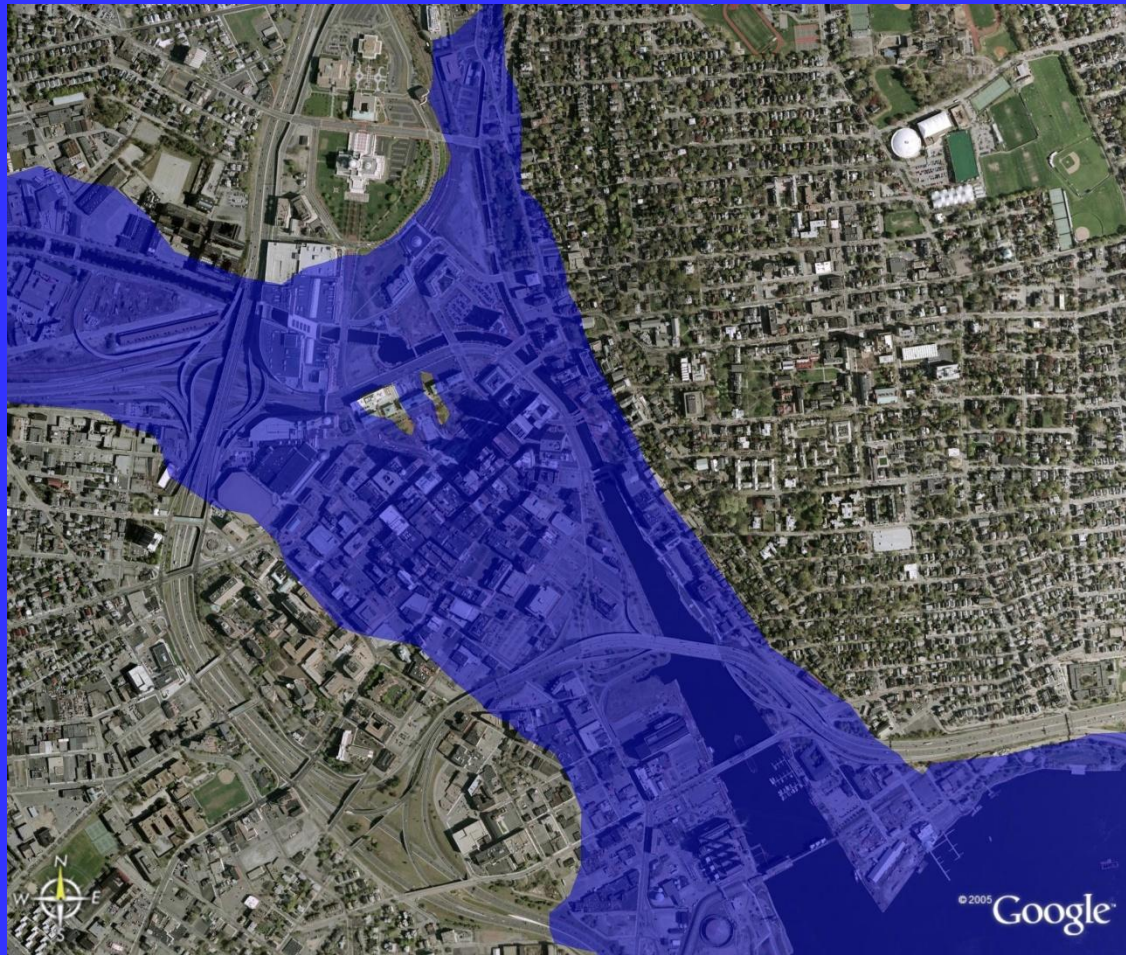
Courtesy J. Overpeck and ARCSS

Providence, RI

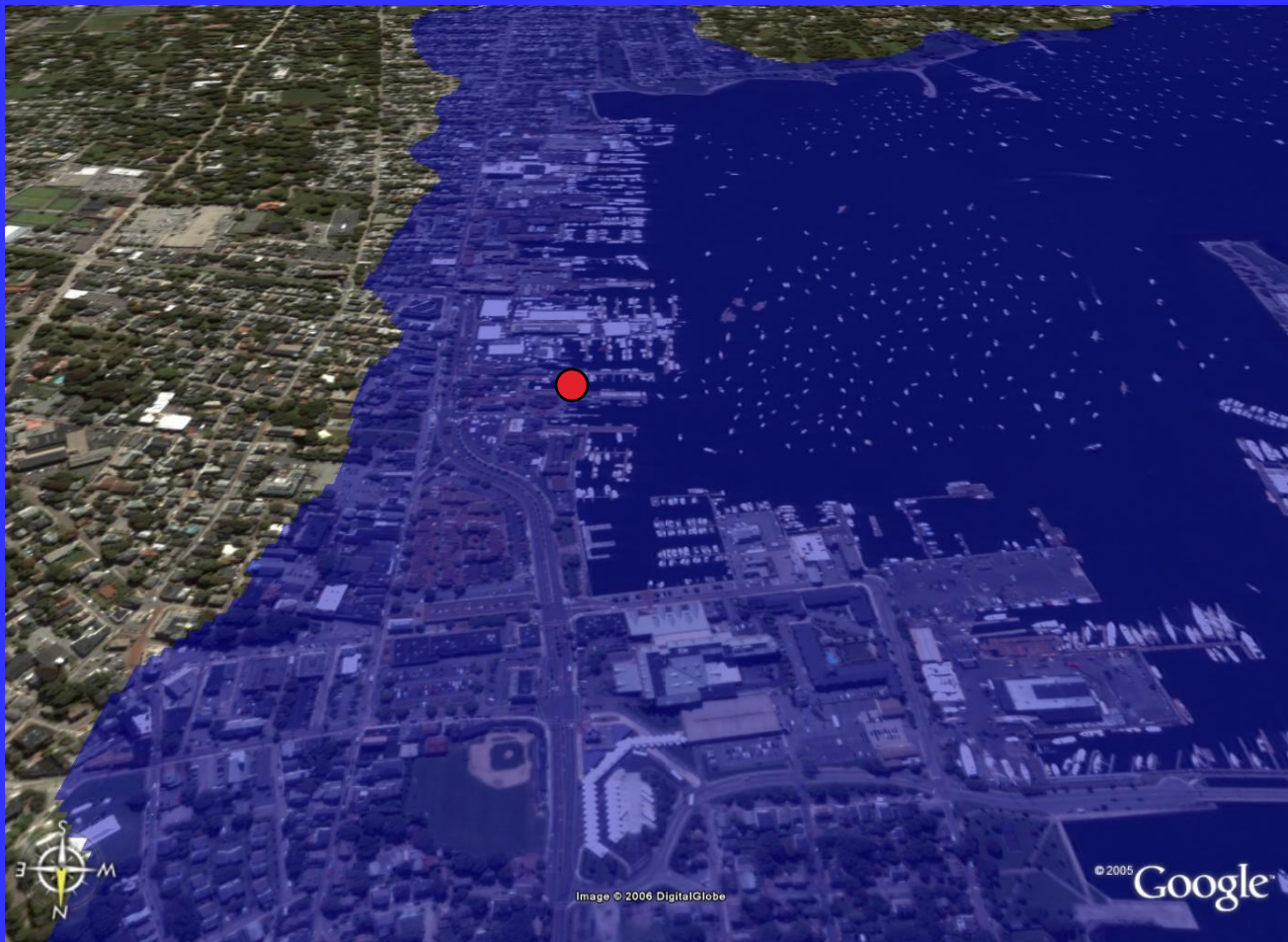


Providence, RI

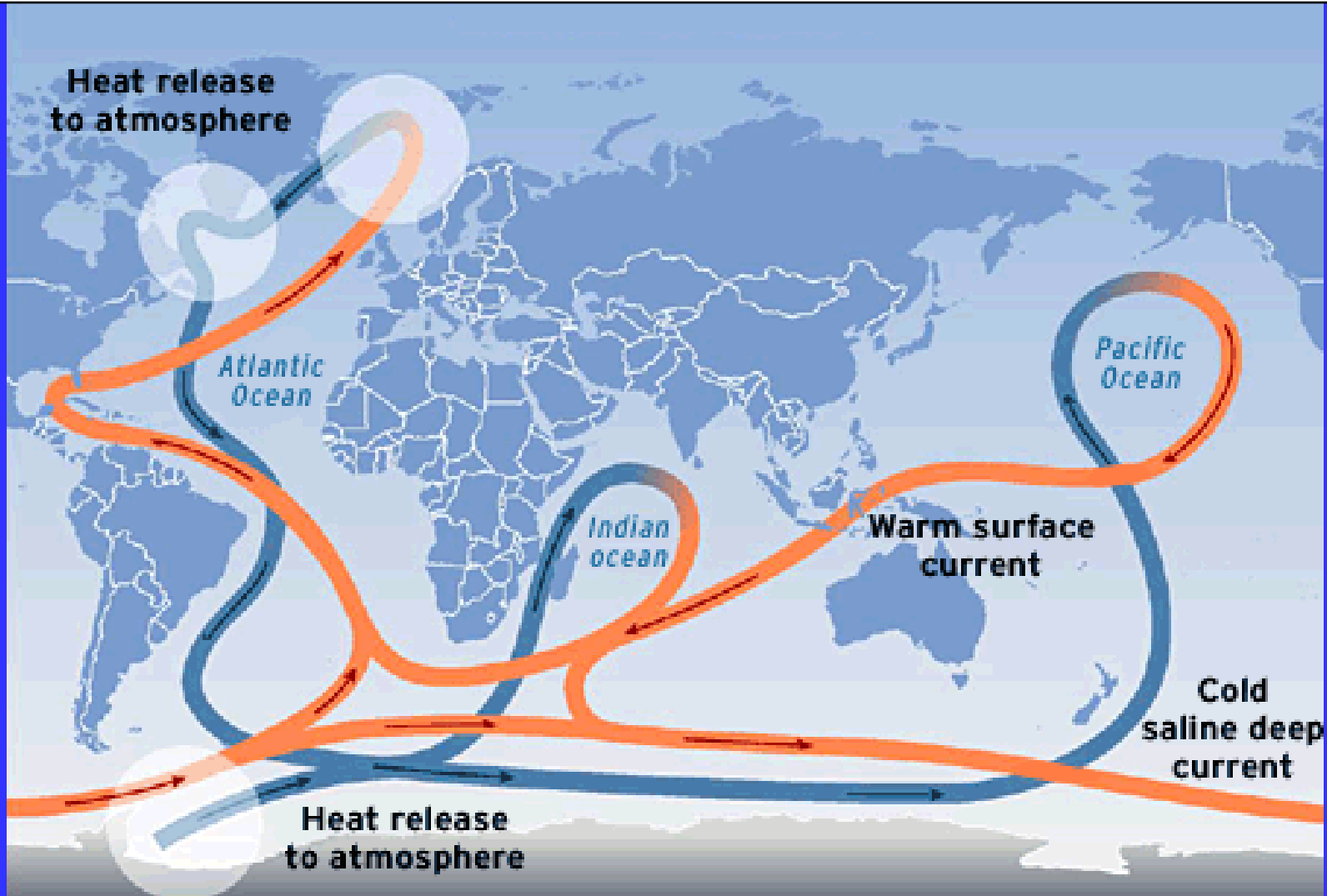
20 ft SLR



Thames St, Newport 20 ft SLR



Global Ocean Conveyor Circulation



After Broecker 1995

Is there anything we can do? YES!

Slow Global Warming by Limiting CO₂ Emissions

Rhode Island Climate Change Legislation 2008

- Global Warming Solutions Act: Reduce global warming pollution in RI 20% by 2020 and 80% by 2050
 - Reduce overall vehicle miles traveled (#1)
 - Require electric utilities (#2) to prioritize renewable energy sources
- Promote local clean energy projects
- RI Green Buildings Act

Smart Public Policy Makes A Difference: The Rhode Island Example

Million Tonnes of Carbon Equivalent

1990

1995

2000

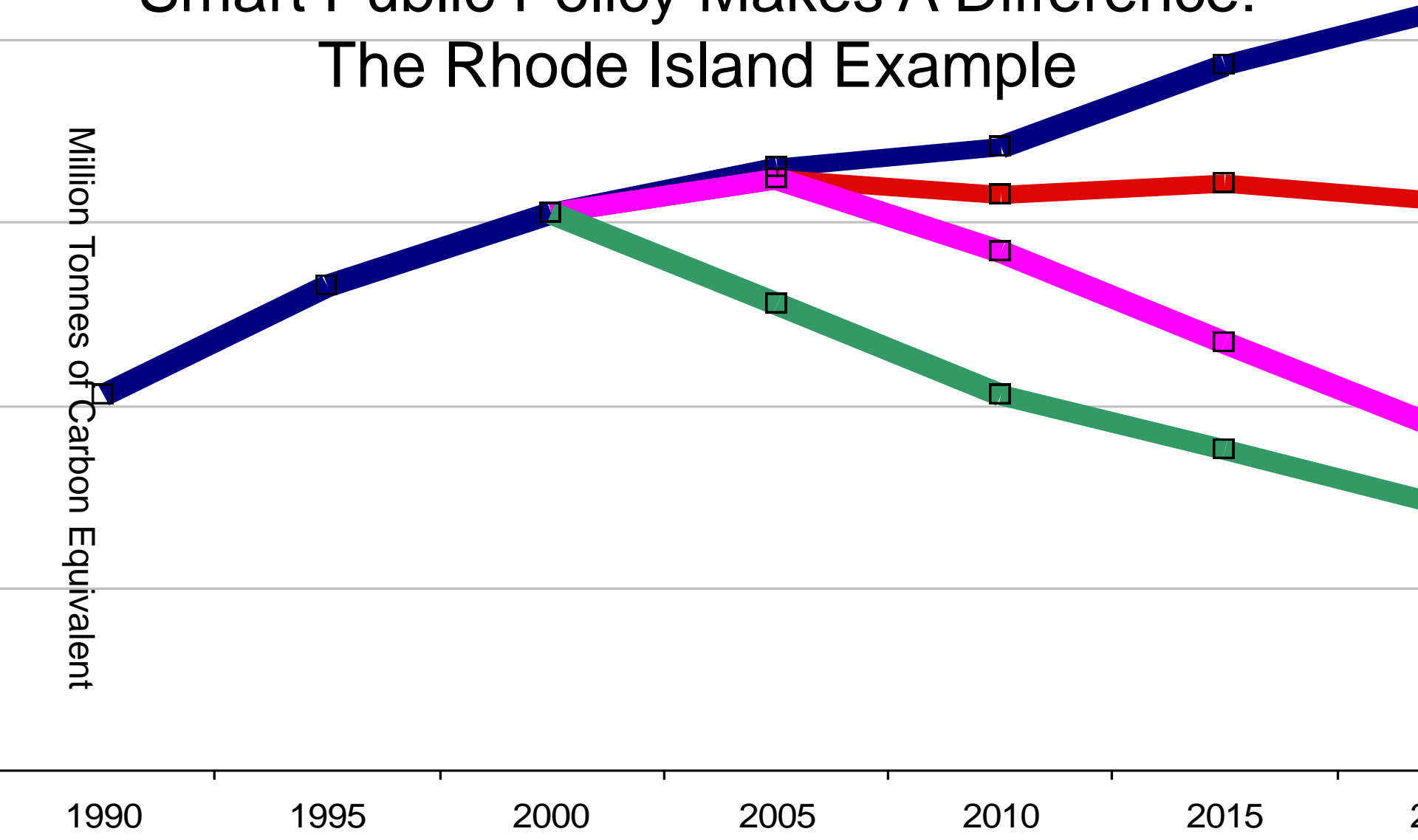
2005

2010

2015

20

- Rhode Island Baseline (2001)
- Projected Pollution Reductions With Implemented Solutions (2006)
- Projected Pollution Reductions With Policies Under Consideration



The Warner-Lieberman Climate Security Act

S. 2191, approved by the Senate Environment and
Public Works Committee on December 5, 2007

Office of Senator Sheldon Whitehouse

Greenhouse Gases Covered

- S. 2191 establishes a greenhouse gas emission cap that covers all six of the primary industrial greenhouse gases.
 - Carbon Dioxide
 - Methane
 - Nitrous Oxide
 - Hyrdofulorocarbons
 - Perfluorocarbons
 - Sulfur Hexafluoride
- The sources covered by the emissions cap are currently responsible for 87% of US greenhouse gas emissions



Declining Cap

- The 2012 cap is set at 4% below the 2005 U.S. emissions level
- Each subsequent year's cap is lower than the one immediately preceding it.
 - 2020 – 19% below 2005
 - 2030 – 37% below
 - 2040 – 55% below
 - 2050 – 71% below

How the Cap Works

- Each year's cap is expressed as a total number of greenhouse gas emission "allowances."
- Each "allowance" authorizes the emission of one metric ton of carbon dioxide in one year.
- Initially, "allowances" are either allocated or auctioned by the Environmental Protection Agency (EPA).

Who Does What

EPA
Holds all “allowances”
at the start of each year

**CARBON MARKET
EFFICIENCY BOARD**
Monitors the emissions
trading market.

**CLIMATE CHANGE
CREDIT CORPORATION**
Auctions 26.5% of “allowances”
in 2012, phasing up to 69.5%
in 2031 and following years.

allocation

auction

Greenhouse gas producers:

- Electric power plants
- Industrial facilities
- Fuel facilities
- Electricity and natural gas consumers
- Coal mines
- Farmers and Foresters

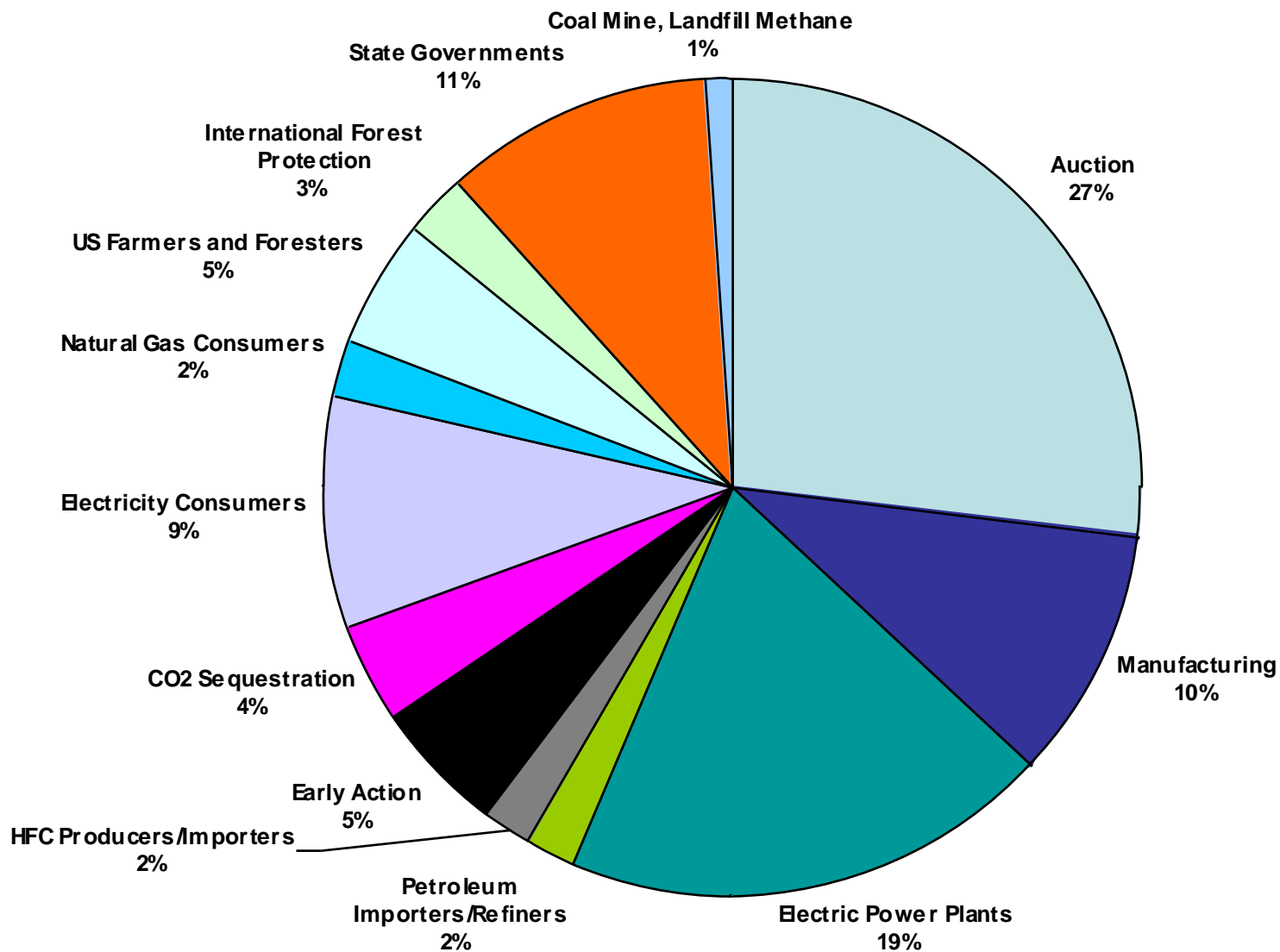
Cap and Trade

- Under America's Climate Security Act, companies are given a number of free "allowances."
- Any "allowance" needs in excess of the allocation must be purchased through auction or company-to-company trade.
- At the end of a year, companies can either trade or save any "allowances" that were unneeded to meet the emission cap.
- Through trade, "allowances" will become a valuable commodity that companies will want to save or sell by reducing its greenhouse gas emissions.
- Through auction, the federal government raises revenues to advance several important public policies.

Auction Revenues

- Develop and deploy advanced technologies and practices for reducing emissions.
- Protect low-income Americans from higher energy costs.
- Keep good jobs in the United States.
- Mitigate the negative impacts of unavoidable climate change on wildlife, oceans, low-income people, etc.
- **Adapt to climate change impacts**

Allocation in 2012



Whitehouse Proposed Amendment

1.5% of Emission Allowance
Account to Coastal States for
Adaptation

State Allocations

\$20/ton GHG in 2012

- 20% divided equally among the states
- 30% based on coastal population
- 50% based on miles of shoreline

\$\$\$ per State for Coastal Adaptation 2012

Alabama	\$17,109,000	Michigan	\$57,710,000
Alaska	\$309,346,000	Minnesota	\$12,184,000
California	\$135,121,000	Mississippi	\$14,212,000
Connecticut	\$23,688,000	New Hampshire	\$12,278,000
Delaware	\$16,132,000	New Jersey	\$56,416,000
Florida	\$149,156,000	New York	\$98,681,000
Georgia	\$32,351,564	North Carolina	\$42,527,000
Hawaii	\$23,778,000	Ohio	\$23,658,000
Illinois	\$34,862,000	Oregon	\$27,368,000
Indiana	\$12,981,000	Pennsylvania	\$22,860,000
Louisiana	\$86,219,000	Rhode Island	\$17,209,000
Maine	\$43,959,000	South Carolina	\$38,825,000
Maryland	\$52,324,000	Texas	\$60,148,000
Massachusetts	\$42,485,000	Virginia	\$56,748,000
		Washington	\$52,703,000

\$\$ for 2012 for Coastal States
and Territories for Adaptation

\$1,675,000,000

What will the \$\$ be used for?

...only for projects and activities to plan for and address the impacts of climate change in the coastal watershed.

Projects and Activities

Address the impacts of climate change with respect to:

- accelerated sea level rise and lake level changes
- shoreline erosion
- increased storm frequency or intensity
- changes in rainfall
- flooding

Projects and Activities

Develop plans to protect (or relocate):

- public facilities and infrastructure
- coastal resources of national significance
- public energy facilities
- public water facilities

Projects and Activities

Research and collect data

- historical shoreline position maps
- historical shoreline erosion rates
- inventories of shoreline features and conditions
- acquisition of high-resolution topography and bathymetry
- sea level rise inundation models
- storm surge sea level rise linked inundation models
- shoreline change modeling based on sea level rise projections
- sea level rise vulnerability analyses and socioeconomic studies
- environmental and habitat changes associated with sea level rise

Research, data collection and use of information to respond and adapt to:

- changes in chemical characteristics (including ocean acidification) and physical characteristics (including thermal stratification) of marine systems
- saltwater intrusion into groundwater aquifers
- increased harmful algae blooms
- spread of invasive species
- habitat loss (particularly loss of coastal wetland)
- species migrations
- other marine, estuarine, and freshwater ecosystem changes associated with climate change

Why is this work important?

\$\$\$\$\$\$\$\$

Kivalina, Alaska

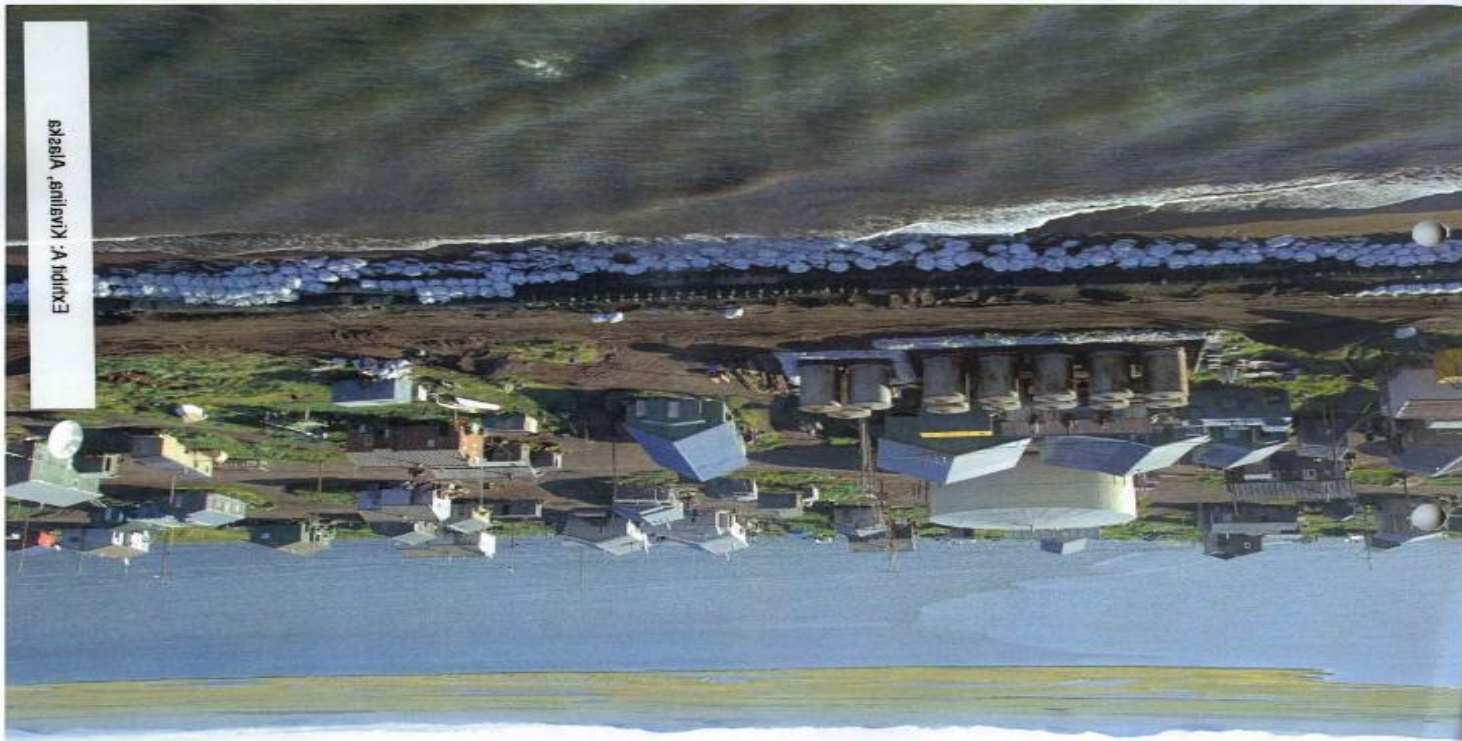


Exhibit A: Kivalina, Alaska

Eroding Alaska town sues 24 oil and energy companies for destruction caused by global warming.

Lawsuit results from ravages of global warming, case seeks relocation of native Alaskan village in order to protect against total destruction.

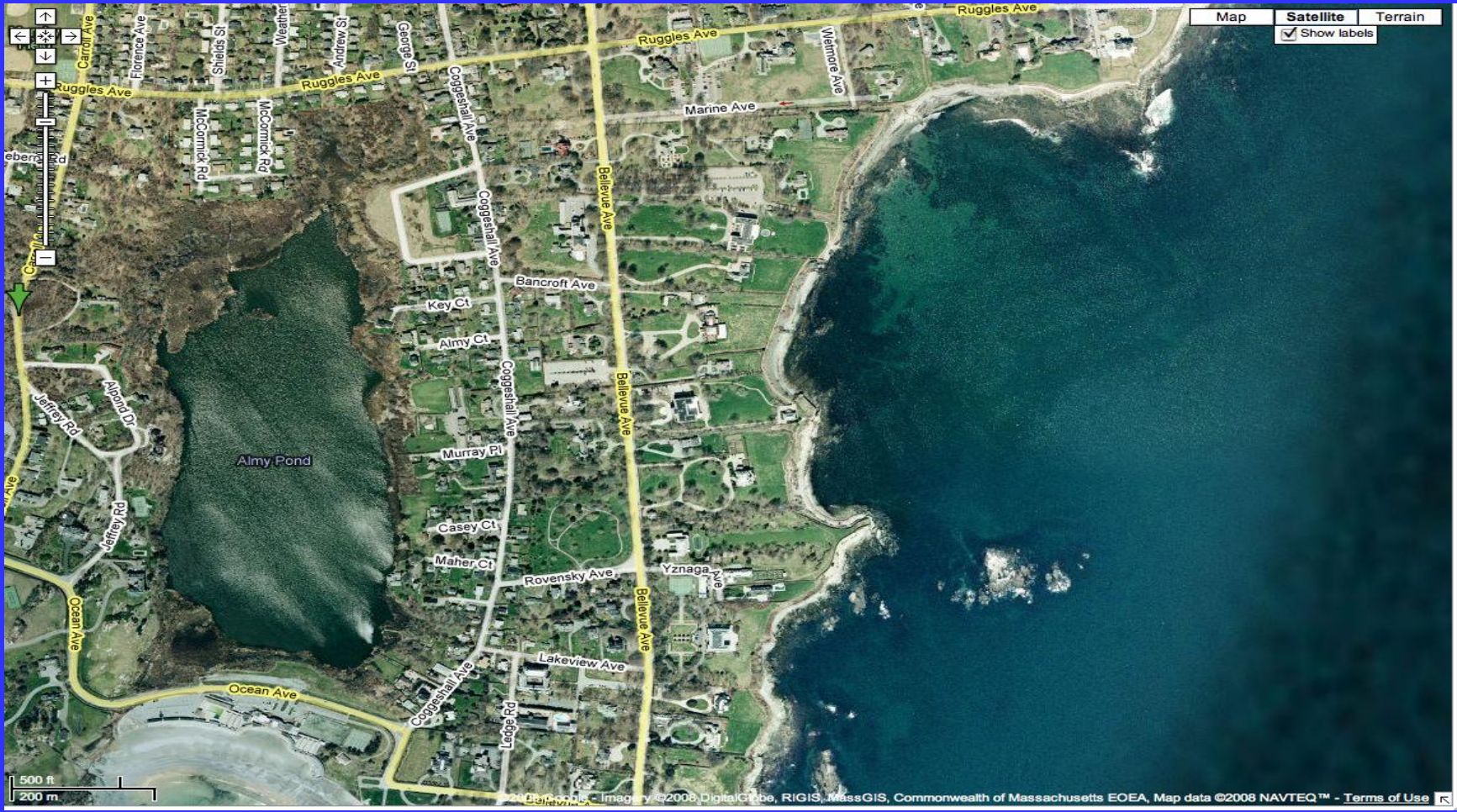
Diminished sea ice has led to massive erosion.

Eroding Alaska town sues 24 oil and energy companies for destruction caused by global warming.

Lawsuit results from recognition of global warming, case seeks preservation of native Alaska village in order to protect against total destruction.

Diminishing sea ice has led to massive erosion.

\$400,000,000



500 ft
200 m

Map **Satellite** Terrain
 Show labels

GLOBAL WARMING
COLLECTION

