As for the future,
your task is not to foresee it,
but to enable it.

Antoine de Saint-Exupery, 1948

We must be the change that we want to see in the world.

Mahatma Gandhi

One's destination is never a place,
but a new way of seeing things.

Henry Miller

To be truly radical is to make hope possible,
rather than despair convincing.

Raymond Williams

The only thing we have to fear is fear itself.

Franklin D. Roosevelt

I have not yet begun to fight!

John Paul Jones

The climate crisis is not a political issue.
It is a moral and spiritual challenge
to all of humanity.

Al Gore

We must accept finite disappointment,
but never lose infinite hope.

Martin Luther King, Jr.

Modern agriculture is the use of land
to convert petroleum into food.

Albert Bartlett, 1978

If you don't change direction, you are likely
to end up where you are headed.

Chinese proverb

The only limit to our realization of tomorrow will be our doubts of today.

Franklin D. Roosevelt

Everyone is entitled to their own opinion,
but not their own facts.

Daniel Moynihan

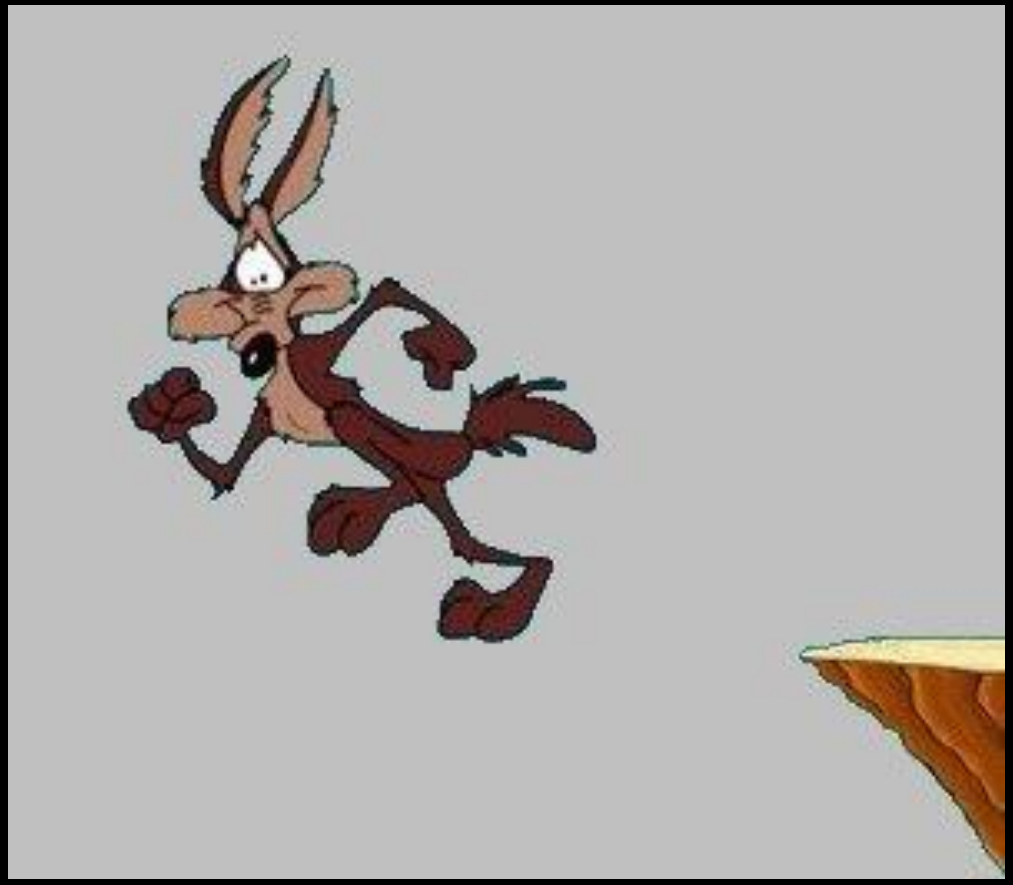
Don't give up the ship!

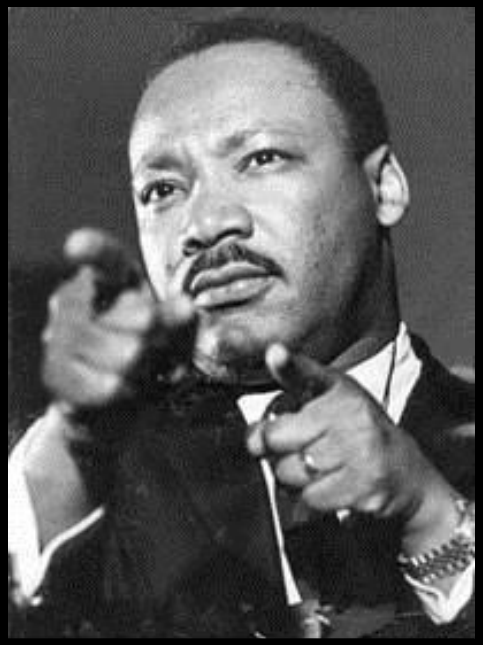
Captain James Lawrence,1813

State of the World 2013

IS SUSTAINABILITY *Still Possible?*

THE WORLDWATCH INSTITUTE





We are faced with the fact, my friends, that tomorrow is today. We are confronted with the fierce urgency of now.

In this unfolding conundrum of life and history there is such a thing as being too late. . .

Over the bleached bones and jumbled residues of numerous civilizations are written the pathetic words: 'Too late.'

Martin Luther King, Jr.

Scientists are forewarning – **450 ppm**

- will trigger potentially irreversible glacial melt and sea level rise…

"out of humanity's control."

As of March 18, 2014 - **401.19 ppm**

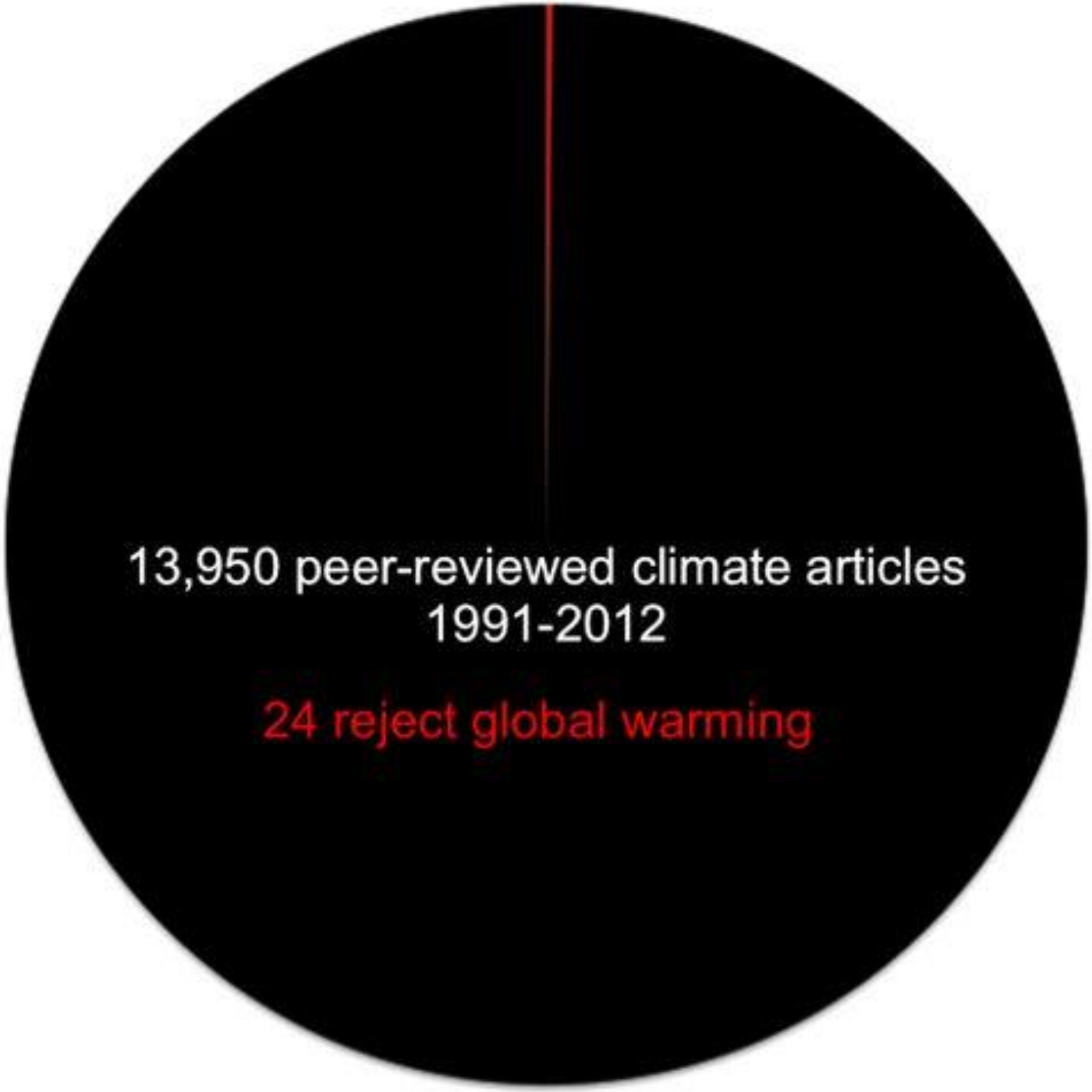
At the current population growth rate of **1.5%**, atmospheric concentrations of CO_2 are increasing at a rate at approx. **2 ppm** annually.

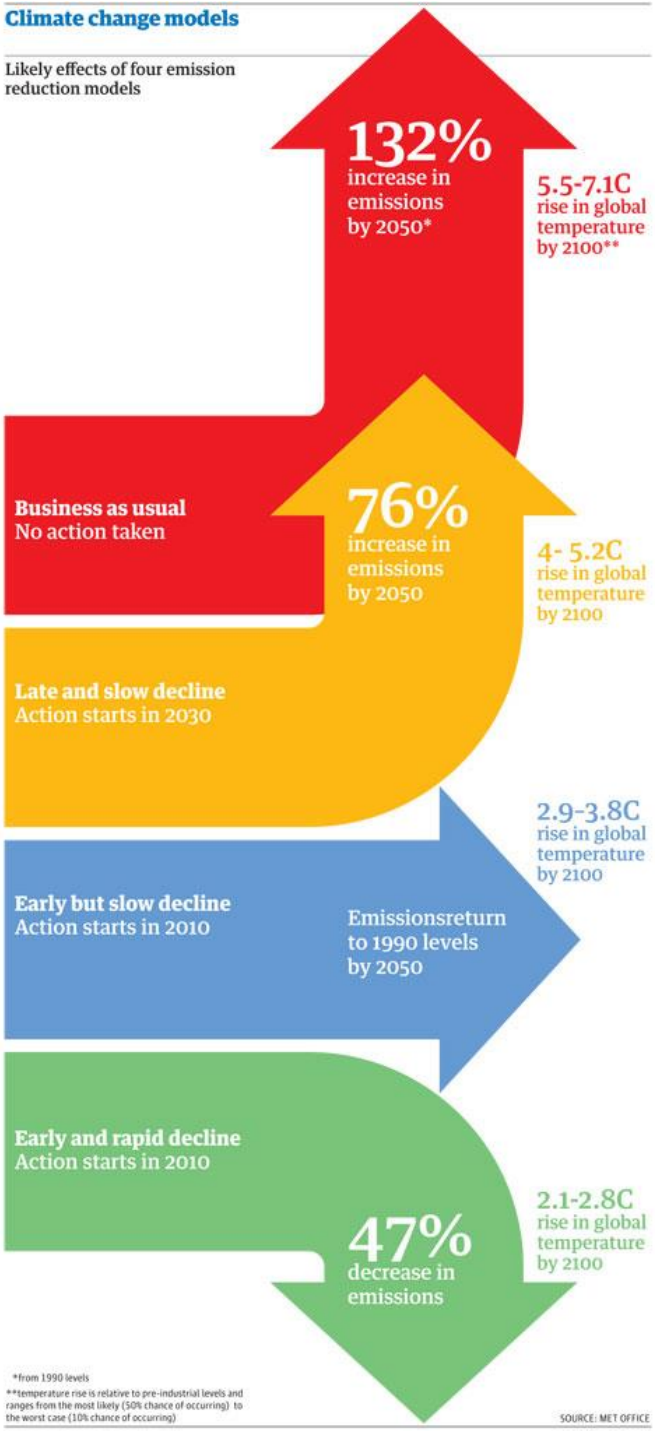
450 ppm in 2038

RUNAWAY CLIMATE

CARBON DIOXIDE

TEMPERATURE


13,950 peer-reviewed climate articles
1991-2012
24 reject global warming



Scenario 4: Business as Usual
(No action taken)
132% Increase in Emissions by 2050
5.5 – 7.1˚C rise in global temperature by 2100

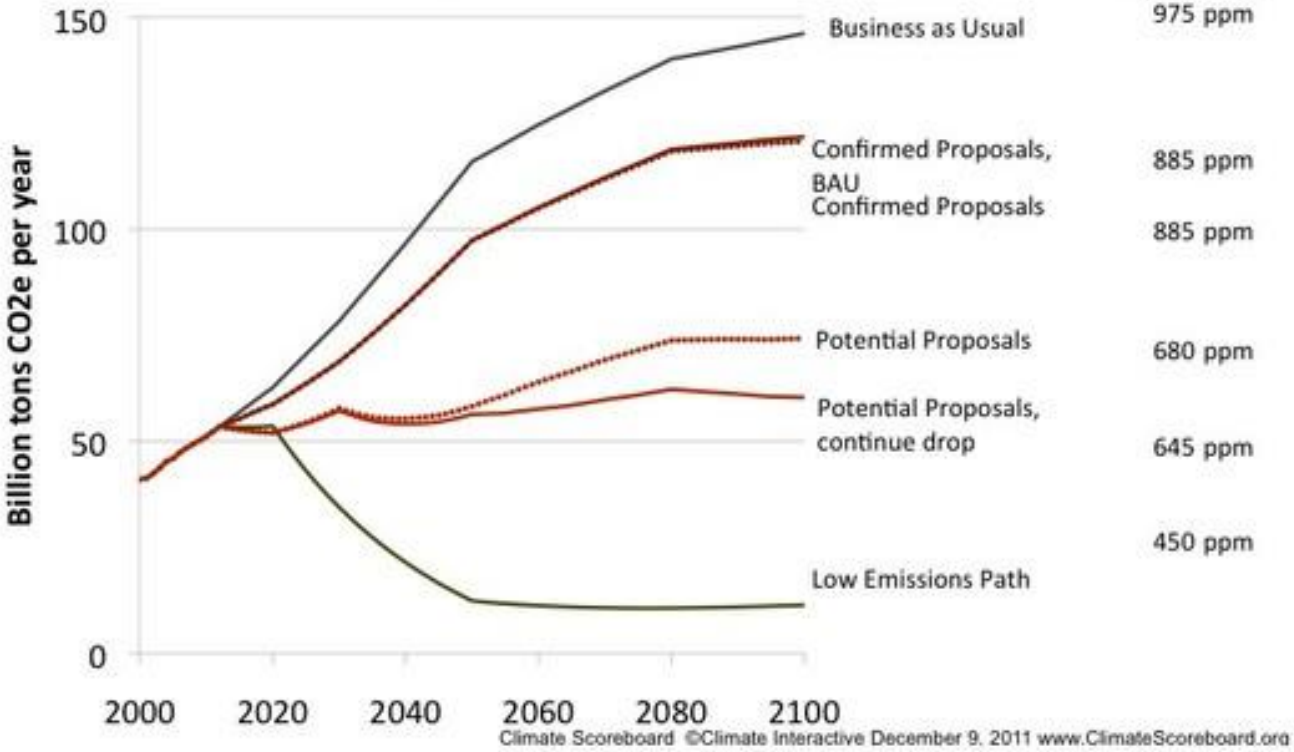
Scenario 3: Late and Slow Decline
Action Starts in 2030
76% Increase in Emissions by 2050 =
4 – 5.2˚C rise in global temperature by 2100

Scenario 2: Early but Slow Decline
Action Starts in 2010
Emissions return to 1990 levels by 2050 =
2.9 - 3.8˚C rise in global temperature by 2100

Scenario 1: Early and Rapid Decline
Action Starts in 2010
47% Decrease in Emissions =
2.1 - 2.8˚C rise in global temperature by 2100

UK Met Office: http://www.metoffice.gov.uk/

Global CO_2e Emissions



Climate Scoreboard ©Climate Interactive December 9, 2011 www.ClimateScoreboard.org

2100 Values

	Atmospheric CO_2	Atmospheric CO_2e	Temp. Increase Over Preindustrial (90% C.I.)
Business as Usual	975 ppm	1440 ppm	5°C (3°-7.9°) 8.9°F (5.4°-14.3°)
Confirmed Proposals, BAU	885 ppm	1215 ppm	4.5°C (2.7°-7.1°) 8°F (4.8°-12.9°)
Confirmed Proposals	885 ppm	1210 ppm	4.5°C (2.7°-7.1°) 8°F (4.8°-12.8°)
Potential Proposals	680 ppm	850 ppm	3.5°C (2.1°-5.6°) 6.3°F (3.8°-10°)
Potential Proposals, continue drop	645 ppm	785 ppm	3.3°C (2°-5.2°) 5.9°F (3.5°-9.4°)
Low Emissions Path	450 ppm	495 ppm	2°C (1.2°-3.2°) 3.5°F (2.1°-5.7°)

CLIMATE INTERACTIVE

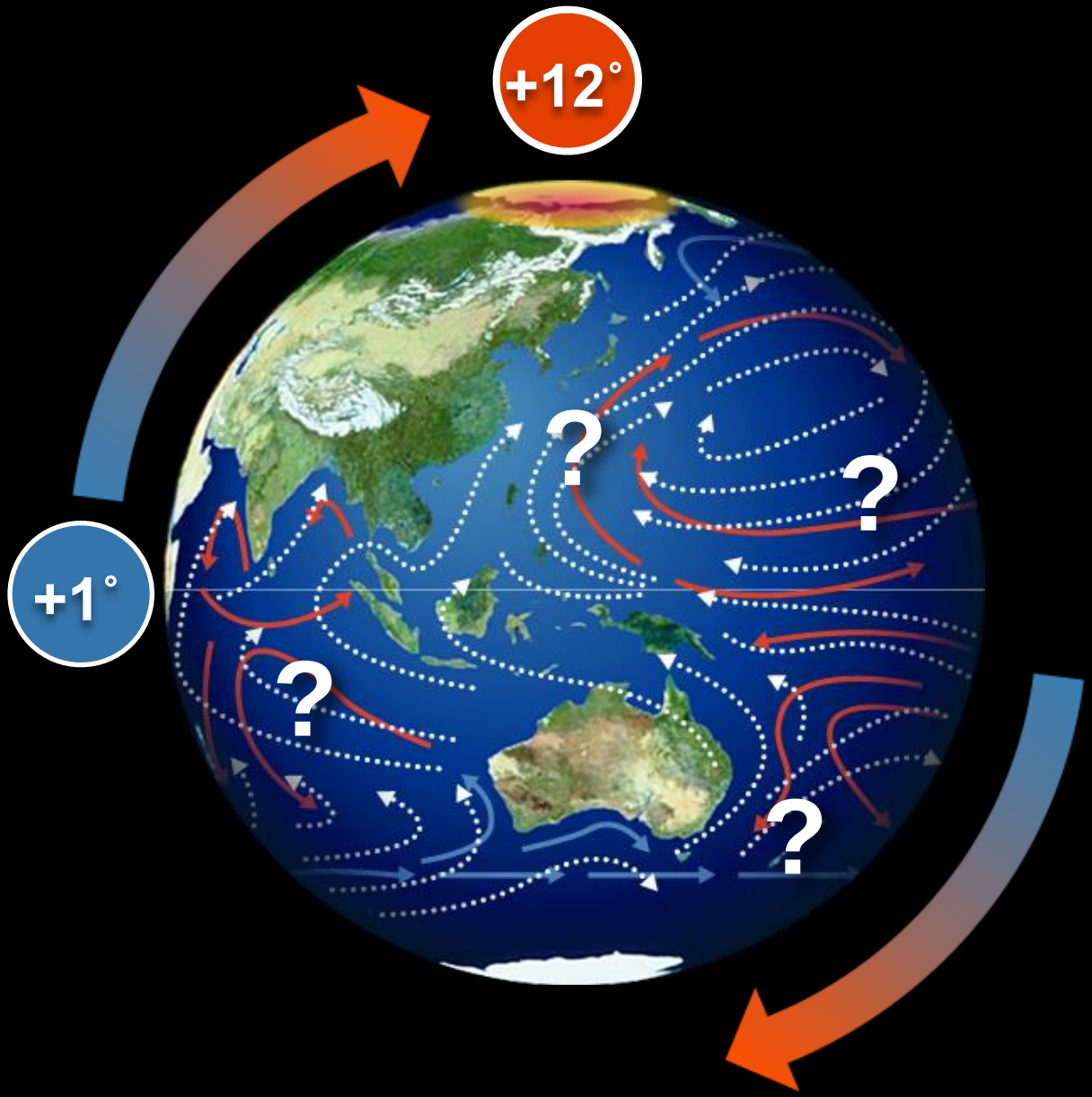
Bulletin of the Atomic Scientists
moves Doomsday Clock to 11:55,
one minute closer to midnight,
based primarily on failures
to address climate change.

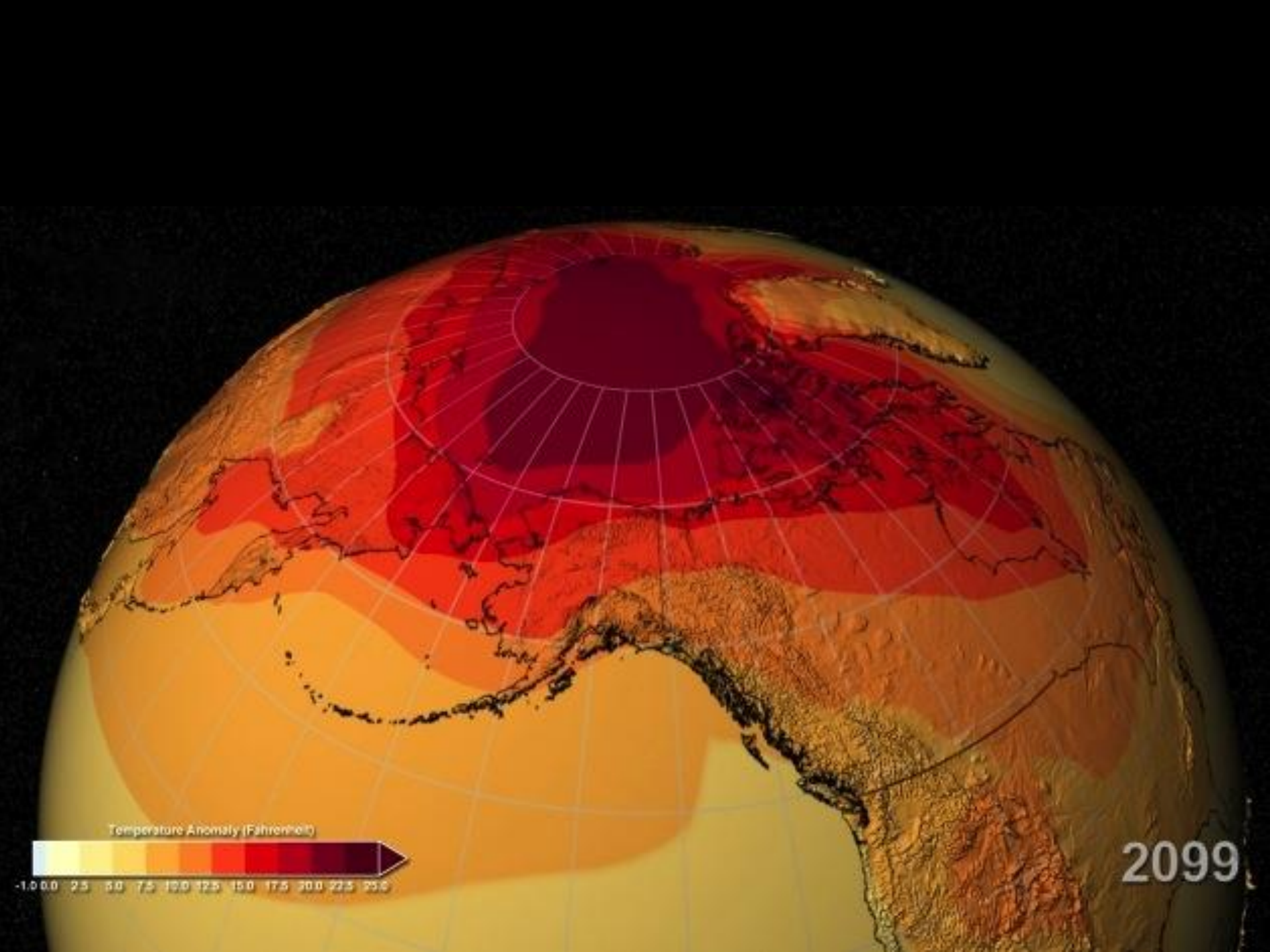
The global climate is a

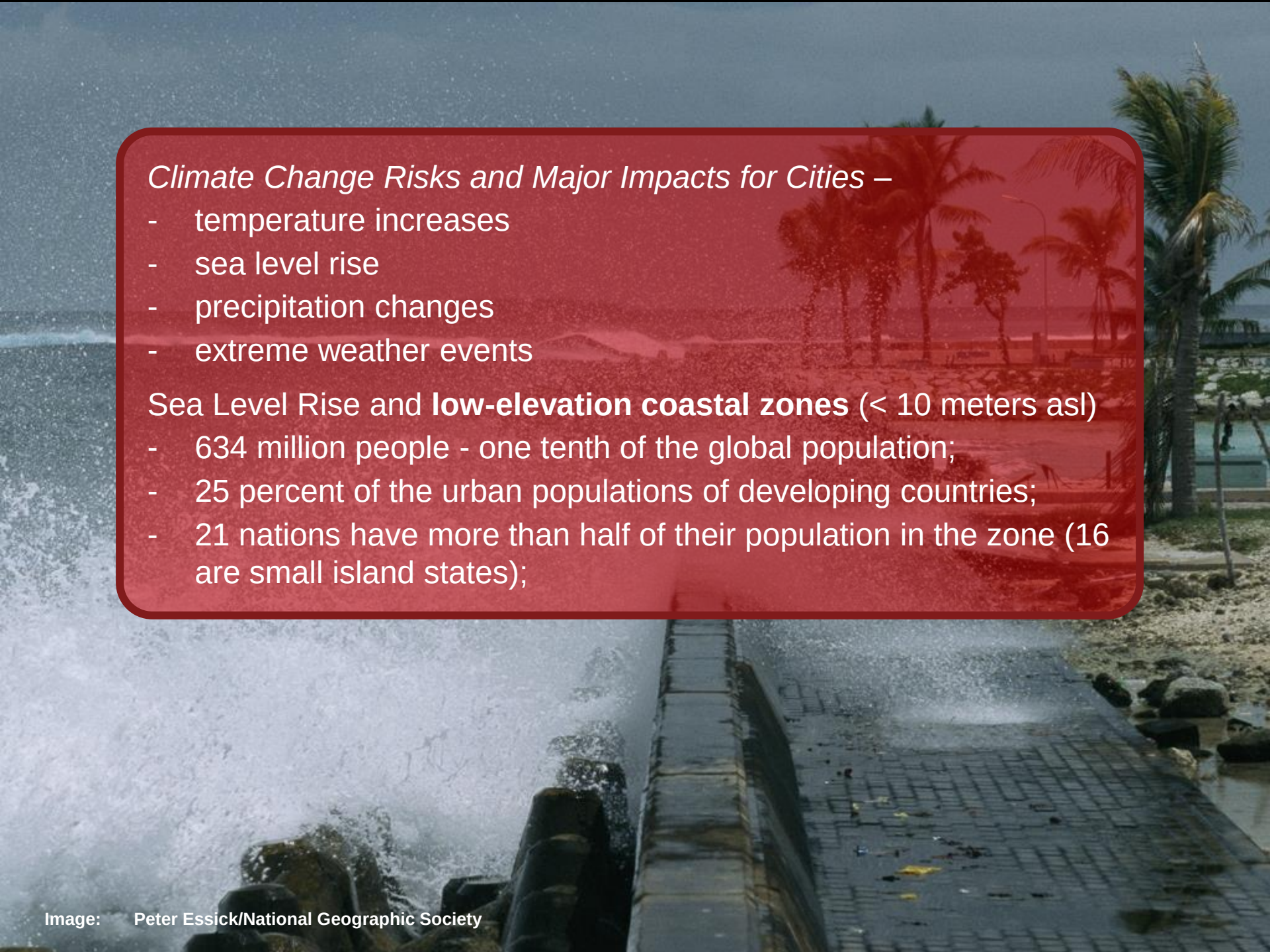
NON-LINEAR

system

An increase of 5˚ (F) in the global average actually means an increase of…


+12°
+1°
?
?
?
?


Temperature Anomaly (Fahrenheit)
-1.0 0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0
2099



Climate Change Risks and Major Impacts for Cities –

- temperature increases
- sea level rise
- precipitation changes
- extreme weather events

Sea Level Rise and **low-elevation coastal zones** (< 10 meters asl)

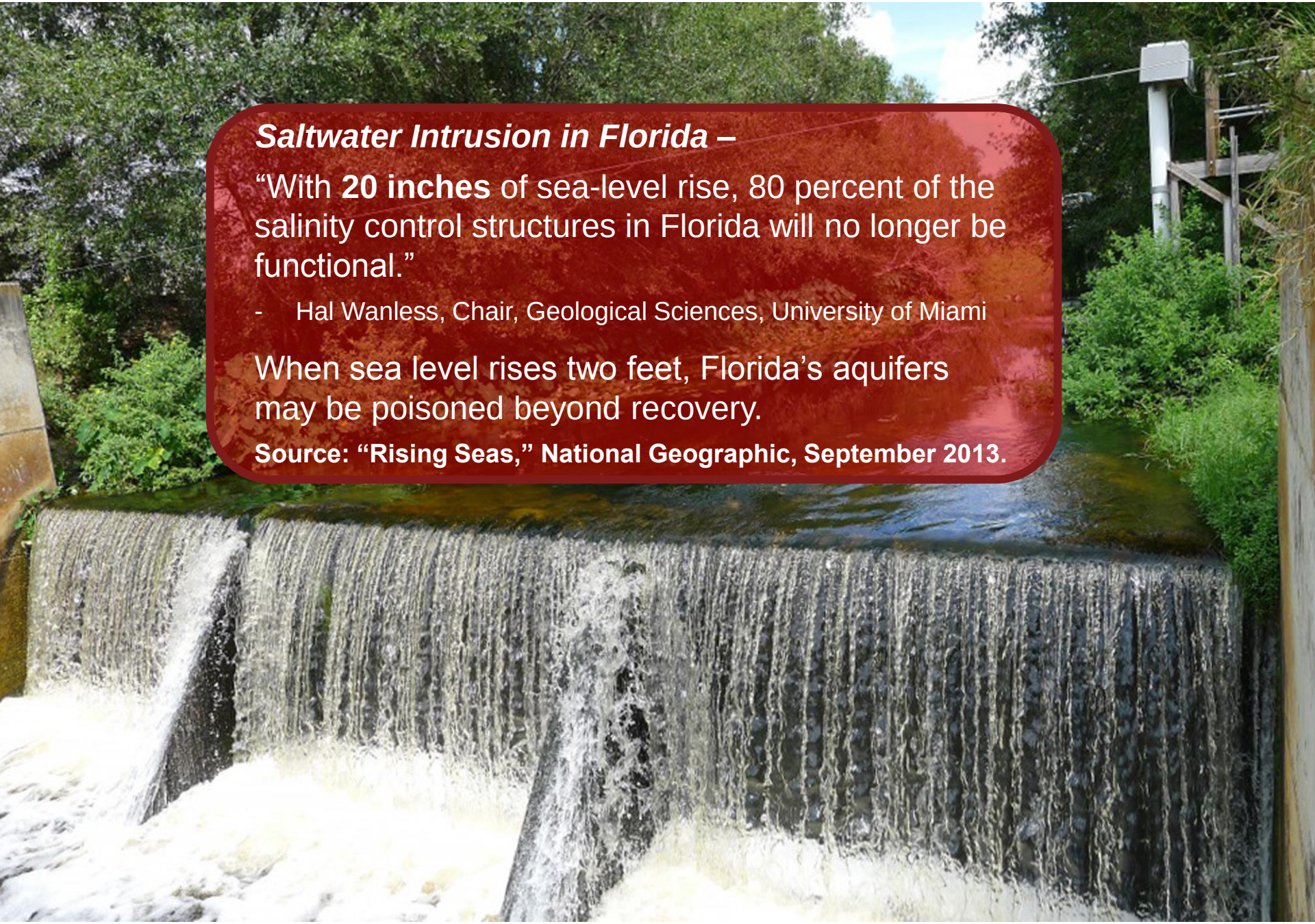
- 634 million people - one tenth of the global population;
- 25 percent of the urban populations of developing countries;
- 21 nations have more than half of their population in the zone (16 are small island states);

Image: Peter Essick/National Geographic Society

2100 Projected Sea Level Rise –
(Due to ice loss from sheets and glaciers, + thermal expansion)

- IPCC 2007 4th Assessment Report: 40 cm;
- IPCC 2013 Draft Report (*leaked*): 29-82 cm;
- Ice2Sea Project: 85 cm – over 1 meter;
- British Antarctic Survey: 69 cm (1:20 risk that sea level rise could be as much as 85 cm);
- U.S. Climate Change Science Program (CCSP) – " thoughtful precaution suggests that a global sea level rise of one meter to the year 2100 should be considered for future planning and policy decisions" (2009);
- NOAA – adopted 6.6 feet (2 meters) as its highest of four scenarios for 2100;
- USACE – recommends that planners consider a high scenario of five feet;
- Vermeer and Rahmsdorf (2009): 1.2 meters (4 feet) by 2100, based on three emissions scenarios.

Conclusion: 1 – 2 meters by 2100



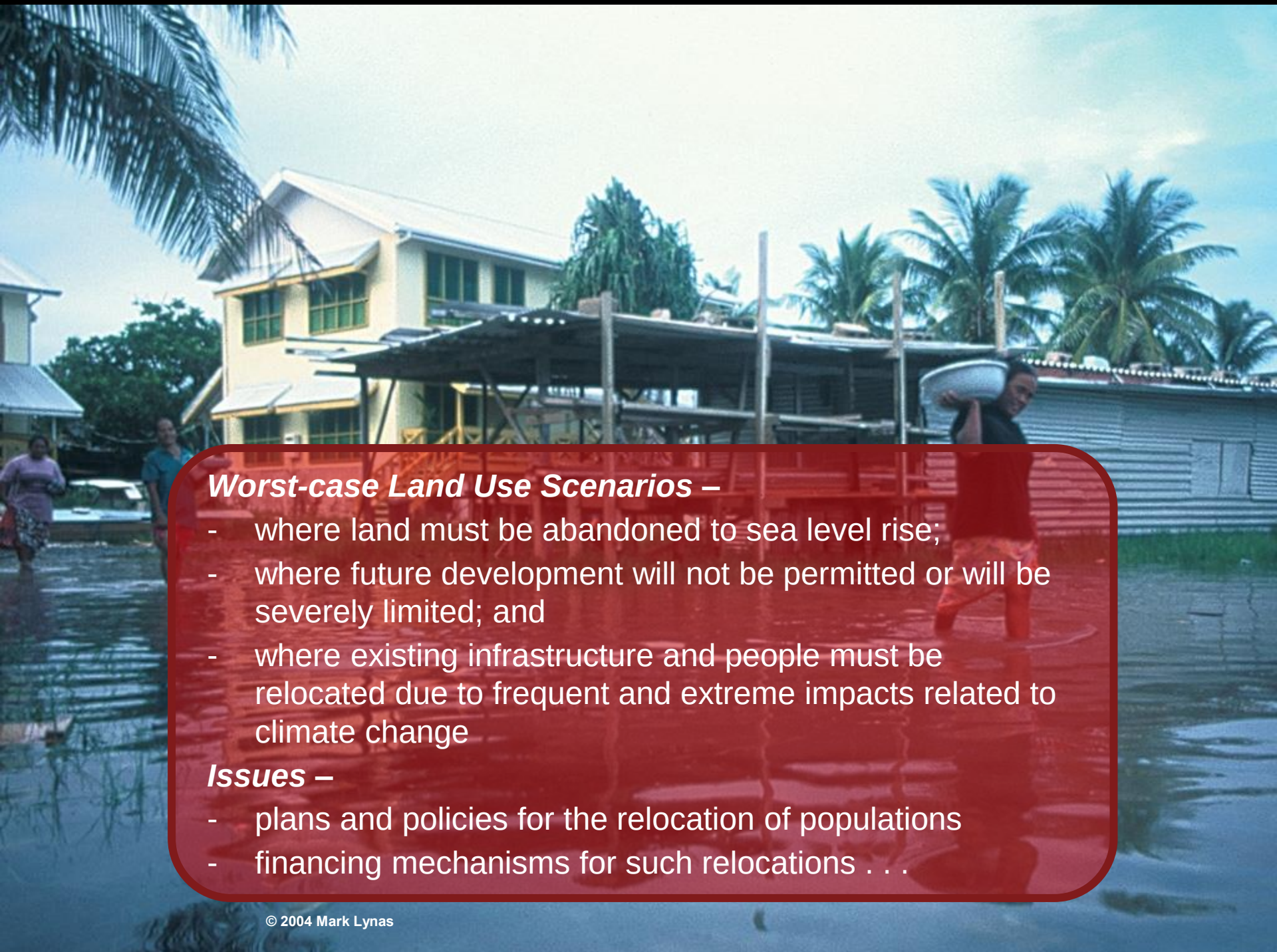
Saltwater Intrusion in Florida –

"With **20 inches** of sea-level rise, 80 percent of the salinity control structures in Florida will no longer be functional."

- Hal Wanless, Chair, Geological Sciences, University of Miami

When sea level rises two feet, Florida's aquifers may be poisoned beyond recovery.

Source: "Rising Seas," National Geographic, September 2013.



Worst-case Land Use Scenarios –

- where land must be abandoned to sea level rise;
- where future development will not be permitted or will be severely limited; and
- where existing infrastructure and people must be relocated due to frequent and extreme impacts related to climate change

Issues –

- plans and policies for the relocation of populations
- financing mechanisms for such relocations . . .

Because 53 percent of all Americans live in and around coastal cities and towns, it is important to understand the point at which sea level rise creates an untenable situation in the U.S.

Beginning with just one meter of sea level rise, our nation would be physically under siege, with calamitous and destabilizing consequences.

Ed Mazria, The 2030 Research Center (2007)

St. Petersburg Flood Protection Barrier-

The battier separates Neva Bay from the Gulf of Finland and protects St. Petersburg (5 million population) from storm surge.

1. Completed in 2011 at a cost of $6 billion;
2. Length: 16 miles long;

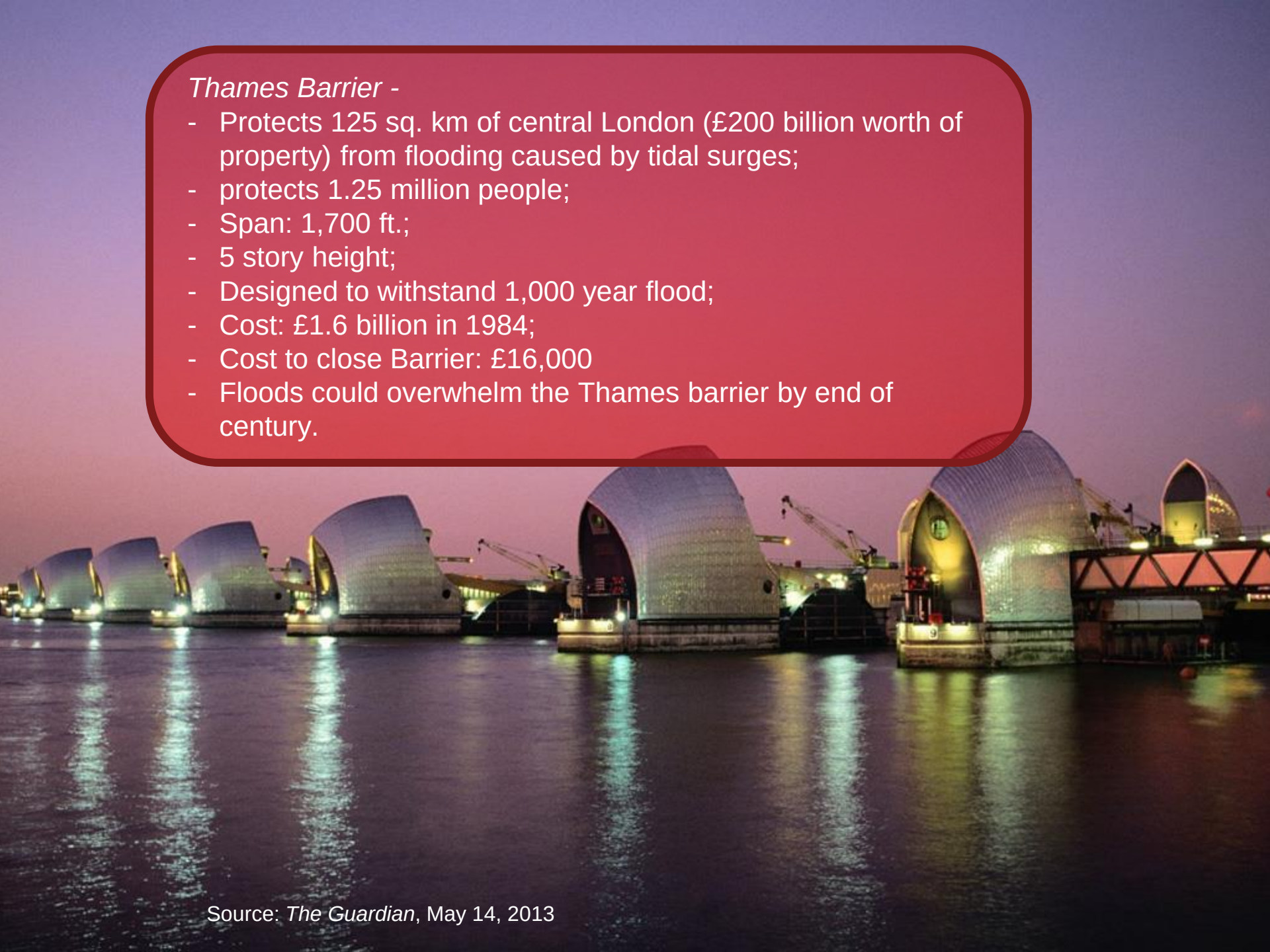
The scheme is designed for a 1000 year flood of 4.55 meters but is checked against failure for a 1:10,000 year flood of 5.15 meters.

The Netherlands Delta Works -

The barrier was built in response to the 1953 North Sea Flood.

1. Completed in 1997 at a cost of $7 billion;
2. Designed for 1,000 year storm;
3. Length: 13 barriers, 1,864 linear miles of outer sea-dykes, and (6,214 linear miles of inner, canal, and river dykes,
4. Reclaimed 895 square miles of land;
5. All financial resources have been committed up to 2020. The level of the Delta Fund for the period 2021 to 2028 is € 9.7 billion.

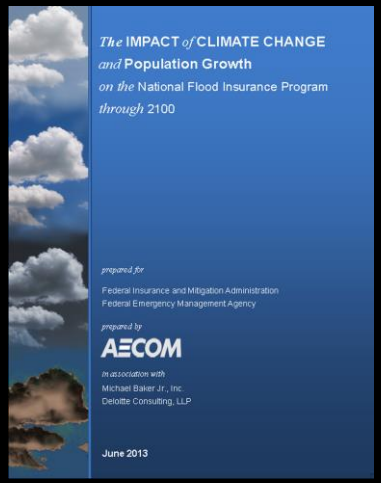
With the Delta Works, the chances of another flood have been reduced to once every 4000 years.



Thames Barrier -

- Protects 125 sq. km of central London (£200 billion worth of property) from flooding caused by tidal surges;
- protects 1.25 million people;
- Span: 1,700 ft.;
- 5 story height;
- Designed to withstand 1,000 year flood;
- Cost: £1.6 billion in 1984;
- Cost to close Barrier: £16,000
- Floods could overwhelm the Thames barrier by end of century.

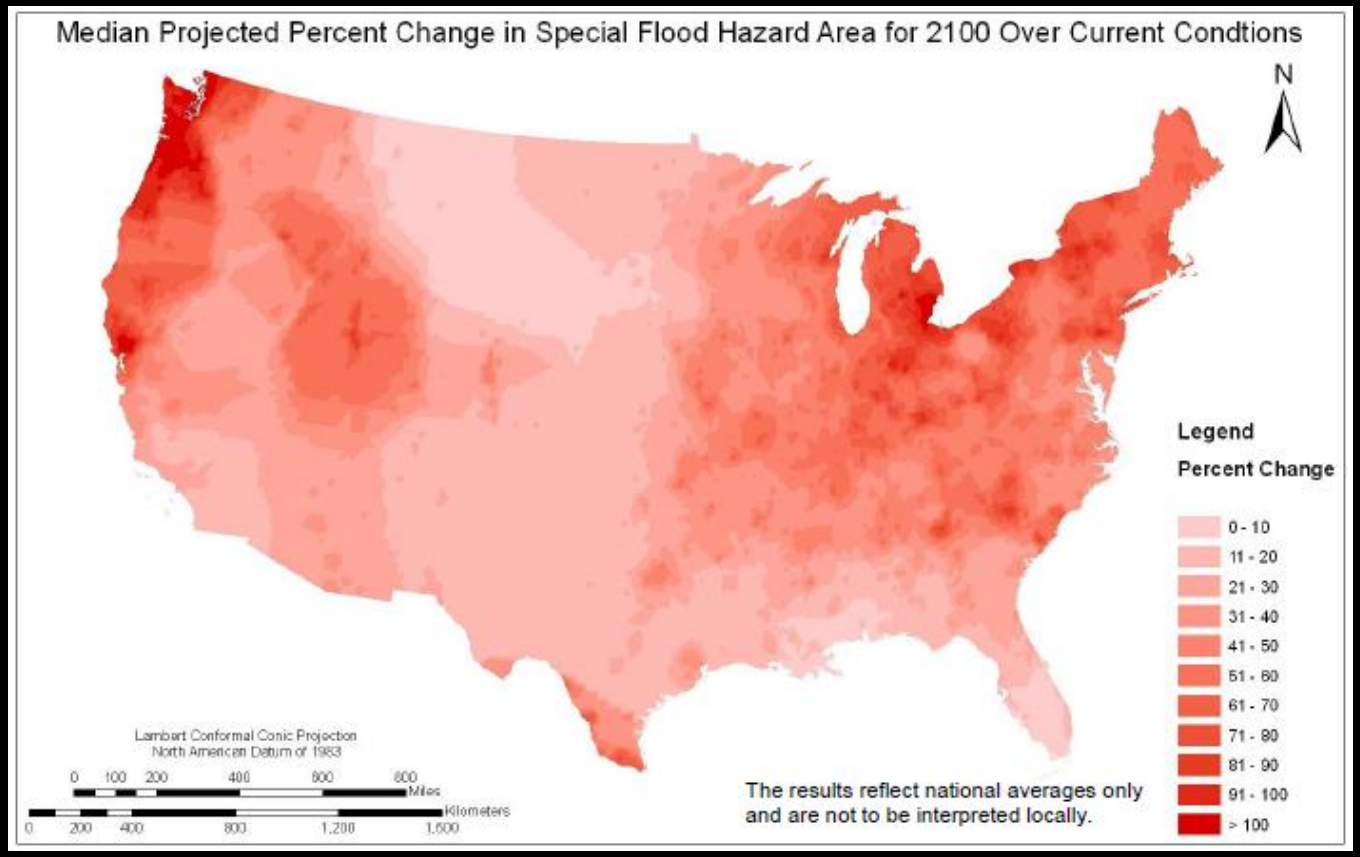
Source: *The Guardian*, May 14, 2013



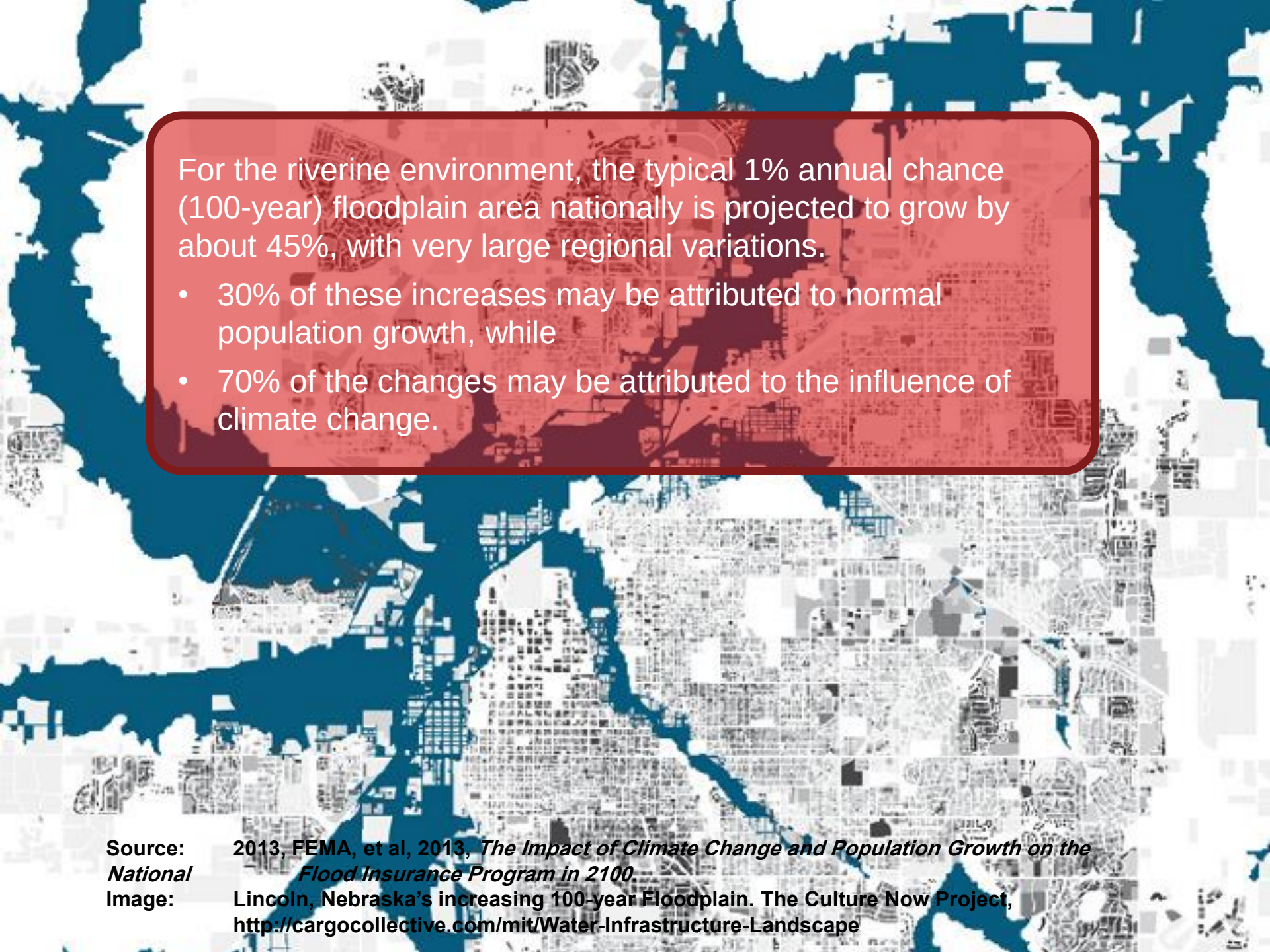
FEMA / GAO Report:

The Impact of Climate Change and Population Growth On the National Flood Insurance Program Through 2100 (June 2013)

Growth in the Special Flood Hazard Area (SFHA) 40% to 45% increase in total area through 2100.



The median (50th percentile) relative change of the SFHA in 2100, based on current conditions.



For the riverine environment, the typical 1% annual chance (100-year) floodplain area nationally is projected to grow by about 45%, with very large regional variations.

- 30% of these increases may be attributed to normal population growth, while
- 70% of the changes may be attributed to the influence of climate change.

Source: 2013, FEMA, et al, 2013, ***The Impact of Climate Change and Population Growth on the National Flood Insurance Program in 2100.***

Image: **Lincoln, Nebraska's increasing 100-year Floodplain. The Culture Now Project, http://cargocollective.com/mit/Water-Infrastructure-Landscape**

What are we doing about it?

Is there enough time to alter this trajectory?

Are we too late . . . ?


EARTH *RIGHT* NOW
Your planet is changing. We're on it.

EARTH *RIGHT* NOW

Friday, Feb. 28, 2014, Tanegashima, Japan.

Global Precipitation Measurement (GPM) Core Observatory onboard, is seen launching from the Tanegashima Space Center.

The GPM spacecraft will collect information that unifies data from an international network of existing and future satellites to map global rainfall and snowfall every three hours.

Image Credit: NASA/Bill Ingalls

EARTH *RIGHT* NOW

Global Precipitation Measurement (GPM) is an international satellite mission that will set a new standard for **precipitation measurements** from space, providing the **next-generation observations of rain and snow worldwide every three hours**.

EARTH *RIGHT* NOW

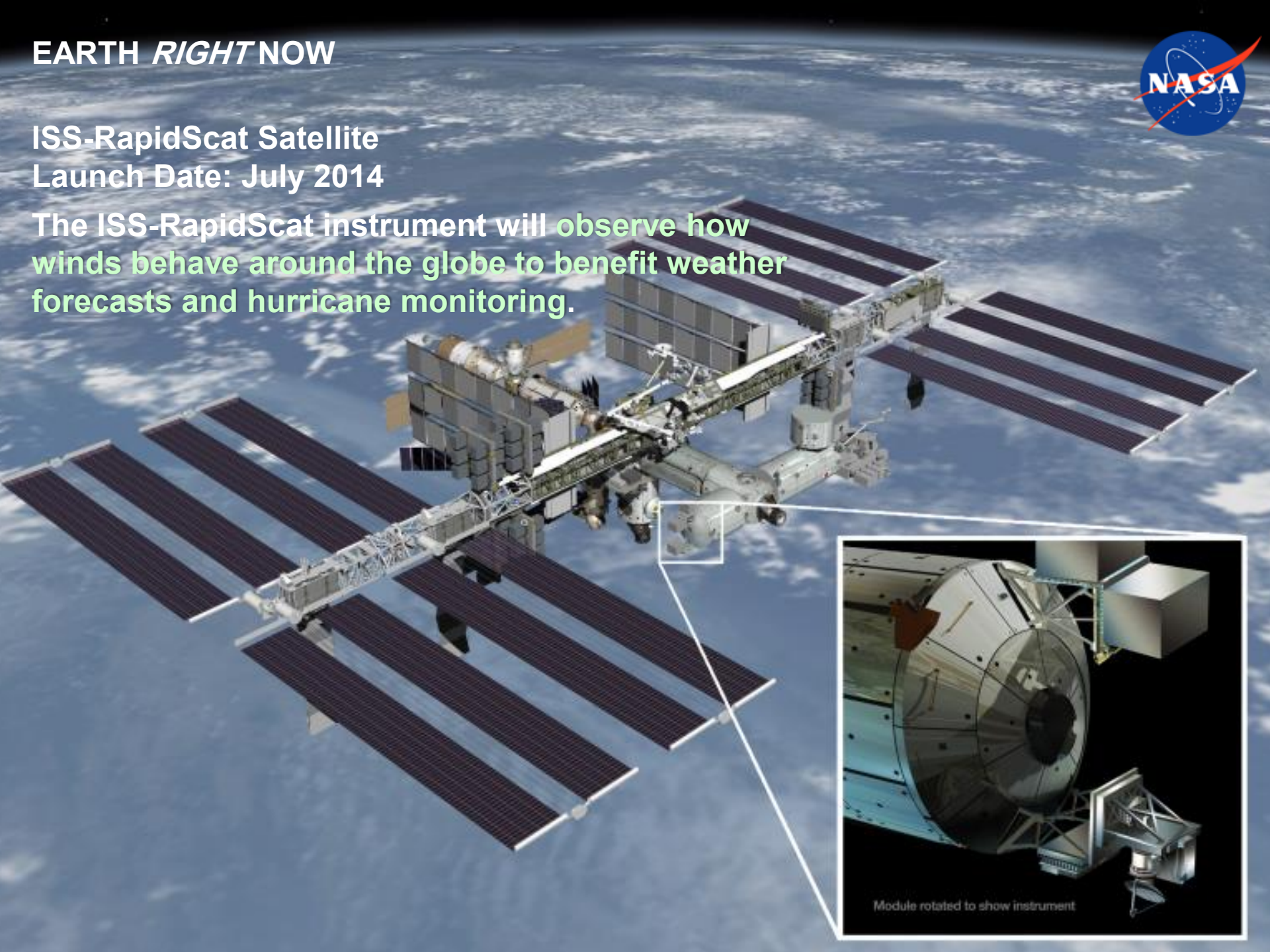
Orbiting Carbon Observatory-2
Launch Date: July 2014

NASA will launch the Orbiting Carbon Observatory-2 to make a completely new set of global, satellite measurements of the still mysterious ways that carbon moves through the atmosphere, land and ocean.

EARTH *RIGHT* NOW

ISS-RapidScat Satellite
Launch Date: July 2014

The ISS-RapidScat instrument will observe how winds behave around the globe to benefit weather forecasts and hurricane monitoring.



EARTH *RIGHT* NOW

Soil Moisture Active Passive Satellite
Launch Date: November 2014

Soil Moisture Active Passive satellite will observe every phase of Earth's critical water cycle, allowing the agency to "follow the water" from underground aquifers to the oceans to moisture and rainfall in the clouds.

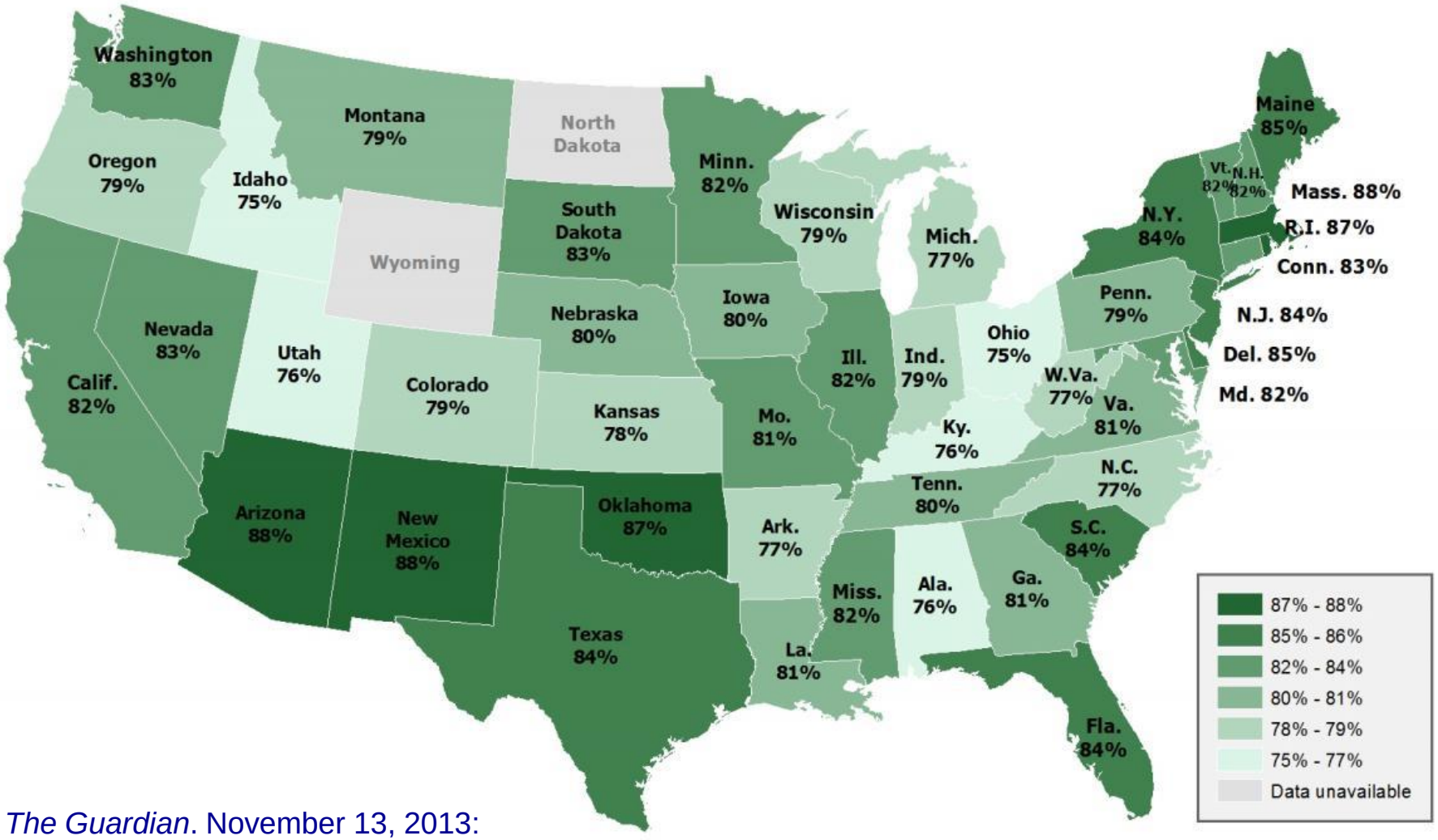
Scientists look to the changes in this cycle as a signature of climate change. Understanding how and how quickly those changes will happen will be vital toward allowing cities and countries to adapt.

- [x] Abundant and free renewable resources
- [x] Technology
- [x] Materials
- [x] Workforce
- [x] Capital
- [x] Rapid mobilization experience
- [ ] Political will?

Percentage of Americans who believe global warming is happening

Stanford University Public Opinion Surveys on Global Warming (2013):

"Has Global Warming Been Happening?"



The Guardian. November 13, 2013:

A vast majority of red-state Americans believe climate change is real and at least two-thirds of those want the government to cut greenhouse gas emissions.

Climate Denial is Dead. (**Just not in Congress**)

There is far-reaching acceptance that global warming is caused by human activities.

1. At least three-quarters of Americans are aware that the climate is changing.
2. At least two-thirds want the government to limit greenhouse gas emissions from businesses.
3. 62 percent want regulations that cut carbon pollution from power plants.
4. At least half want the US to take action to fight climate change, even if other countries do not.

90 percent of the Republican leadership in both House and Senate deny climate change.

The Age of Fact-free Science

17 out of 22 Republican members (77 percent) of the House Committee on Science, Space and Technology are climate deniers.

22 out of 30 Republican members (73 percent) of the House Energy and Commerce Committee, deny the reality of climate change.

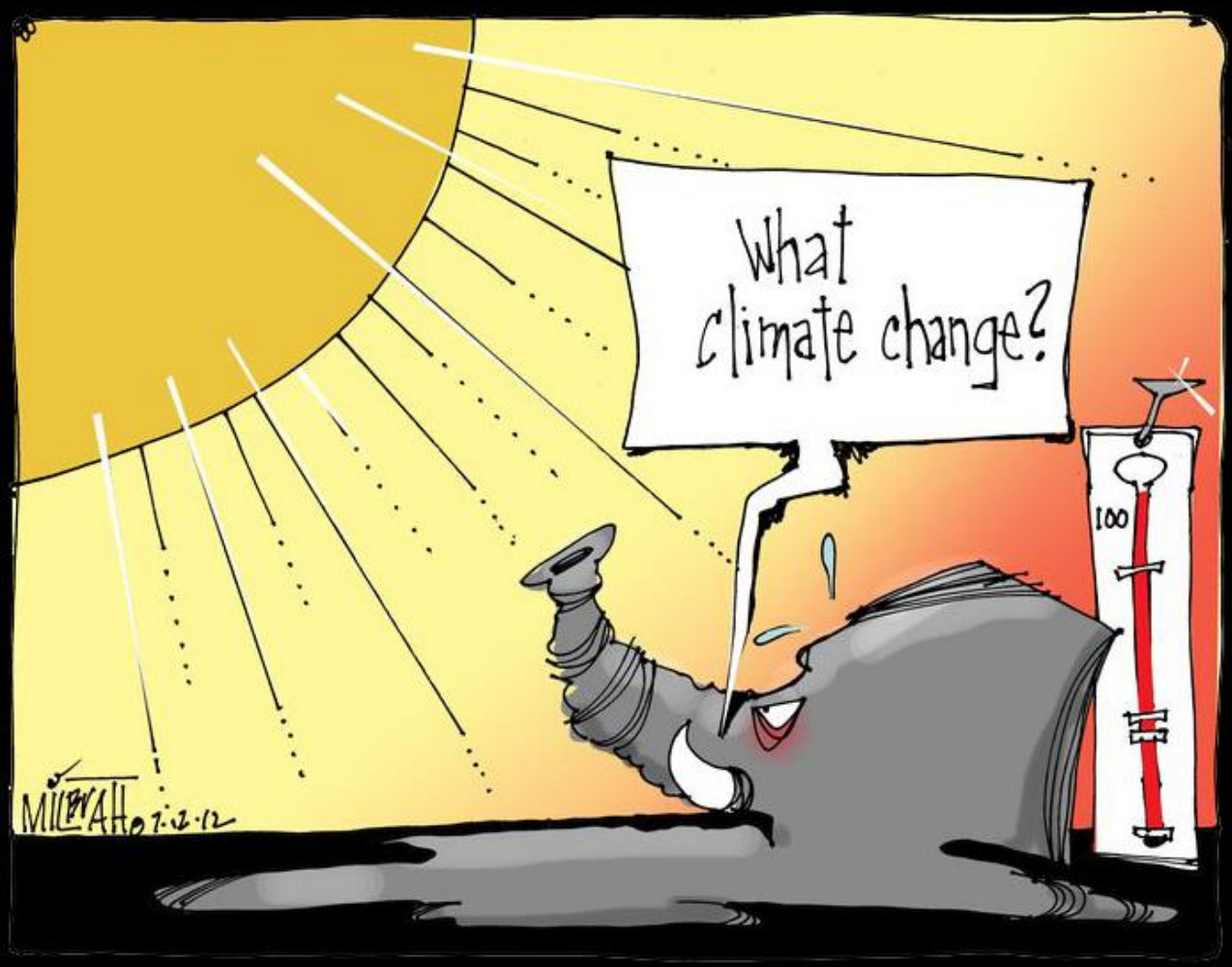
100 percent of Senate Environment and Public Works Committee Republicans have said climate change is not happening or that humans do not cause it.

18 members of the Texas Congressional Delegation deny the reality of climate change.

Climate Progress, June 26, 2013.
http://thinkprogress.org/climate/2013/06/26/2202141/anti-science-climate-denier-caucus-113th-congress-edition/

“Reality has a well-known liberal bias.”

- Stephen Colbert




FLIP A DISTRICT
#flipadistrict
REAL TIME WITH BILL MAHER
YEARS
HOURS

Premise

If we wait for the governments, it will be too little, too late.
If we act as individuals, it will be too late.

However,

if we act as communities, it might just be enough,
just in time.

(Rob Hopkins, The Transition Companion, 2011)

The Light Bulb Syndrome

What can Individuals do?

Versus

What can Governments do?

U.S. Conference of Mayors

Climate Protection Agreement

Under the **Agreement**, participating cities commit to take following **three actions**:

1) Strive to meet or beat the Kyoto Protocol targets in their own communities, through actions ranging from anti-sprawl land-use policies to urban forest restoration projects to public information campaigns;
2) Urge their state governments, and the federal government, to enact policies and programs to meet or beat the GHG emission reduction target suggested for the United States in the Kyoto Protocol –

   7% reduction from 1990 levels by 2012
3) Urge the U.S. Congress to pass the bipartisan GHG reduction legislation, which would establish a national emission trading system.

Status? Uncertain. Can't be measured.

Cities that have signed the Conference of Mayors Climate Protection Agreement:

1,060 (as of March 21, 2014)

85 million U.S. citizens!

Texas Signatories:

Addison
Arlington
Austin
Carollton
College Station
Coppell
Corsicana
Dallas
Denton
Edinburgh
El Paso
Euless
Fairview
Fort Worth
Frisco
Garland
Hurst
Hutto
Laguna Vista
Laredo
McKinney
Mount Vernon
Plano
Port Isabel
Richardson
San Antonio
Shavano Park
South Padre Island
Sugar Land
Texarcana
Westlake

The Practice of Sustainable Urbanism

Environmental Cities

Philosophy

Sustainable Urbanism -

can only be achieved when cities are approached as systems and components of nested systems in ecological balance with each other.

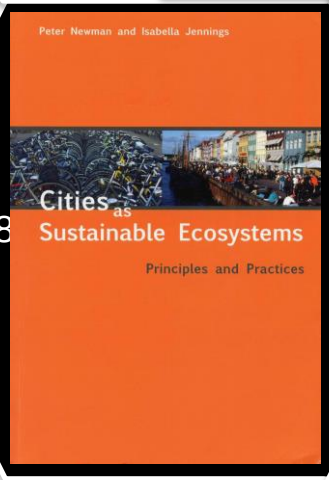
- Marcotullio and Boyle, 2003

Cities as Sustainable Ecosystems –

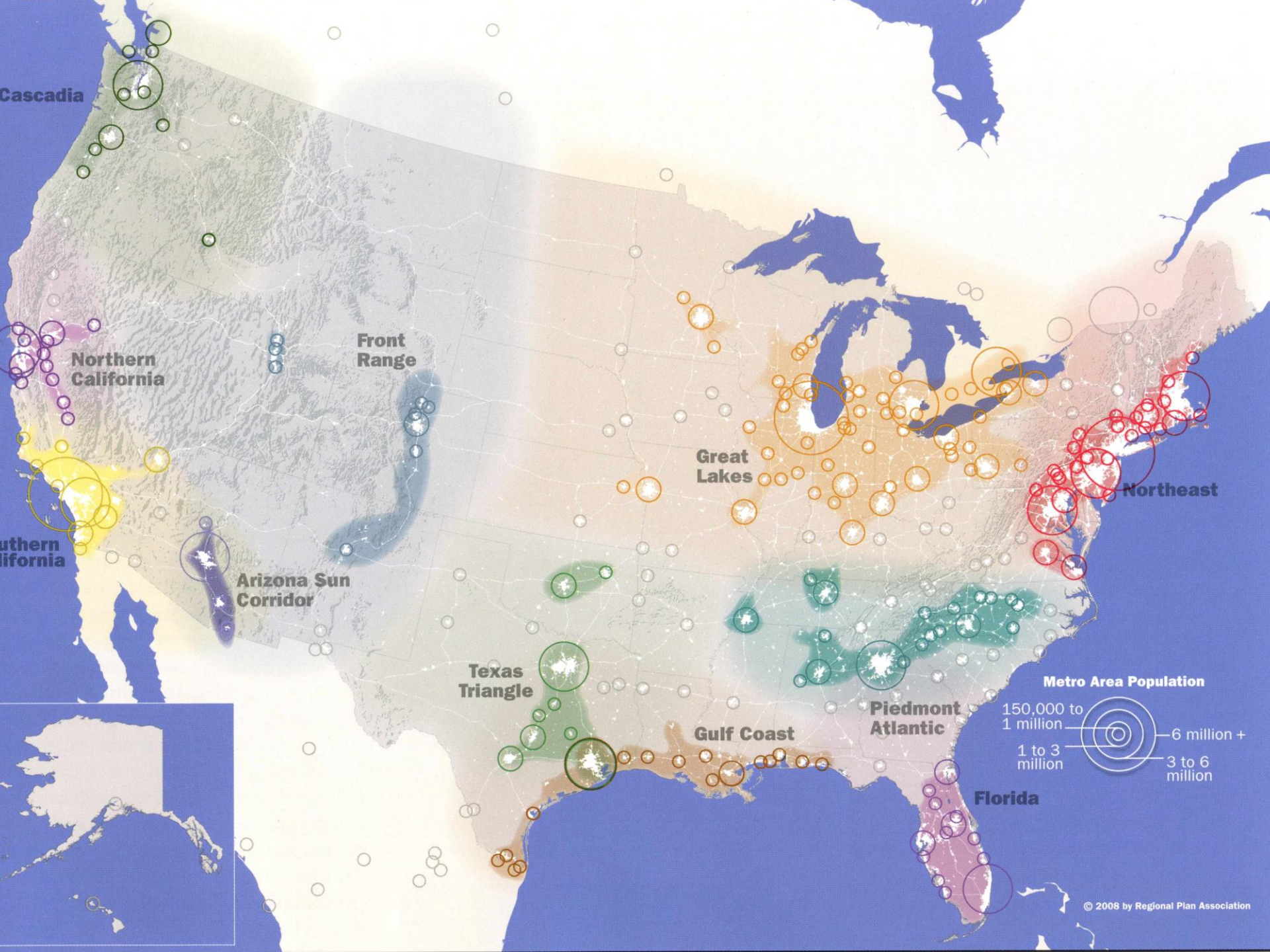
The path to sustainability lies in transforming our cities so that they are based on the patterns and processes of natural, sustainable ecosystems.

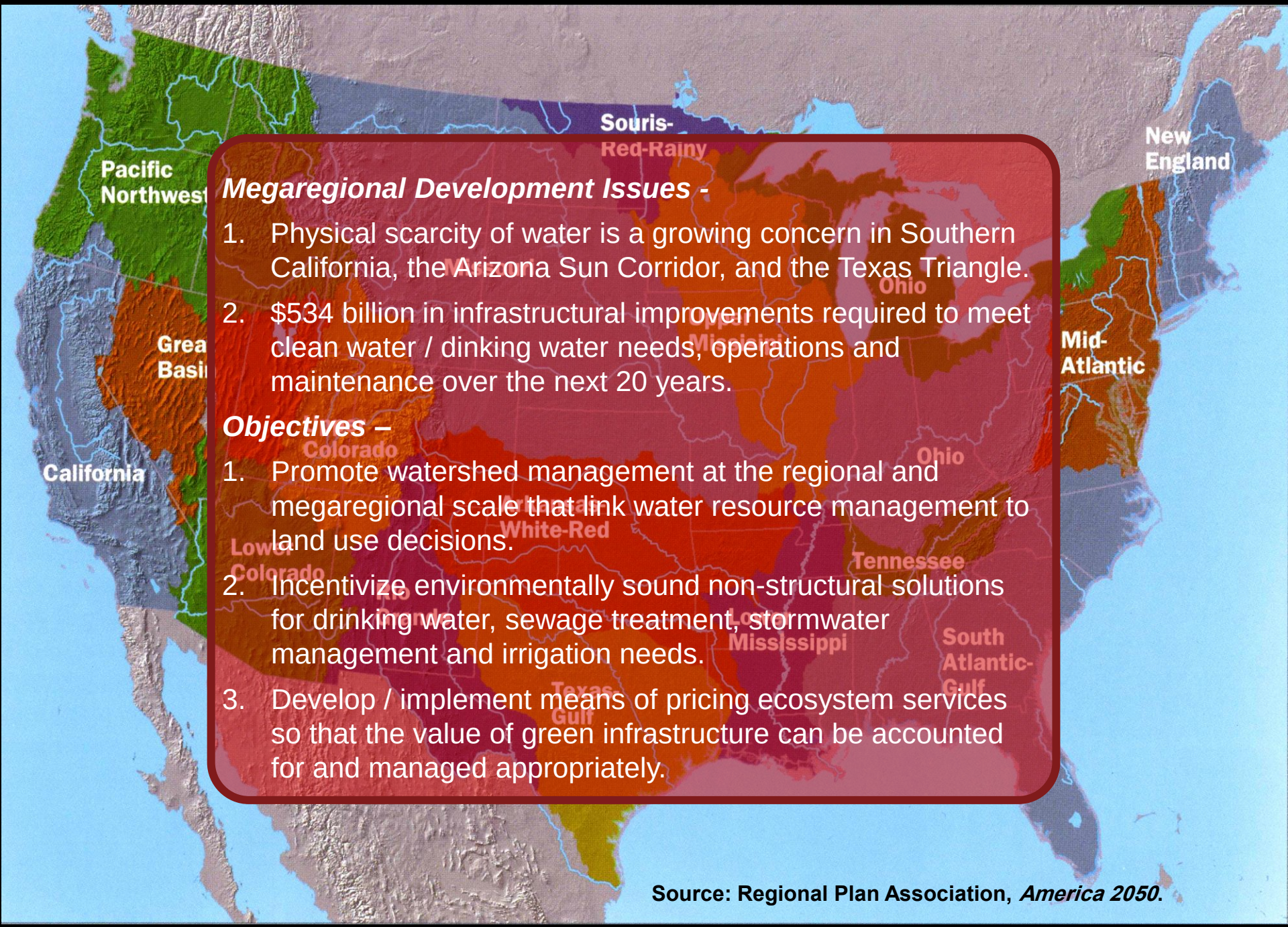
- Peter Newm

2008



Source: Regional Plan Association, America 2050
Image: National Oceanographic and Atmospheric Association, *USA at Night*.


Cascadia
Northern California
Front Range
Great Lakes
Northeast
uthern
lifornia
Arizona Sun Corridor
Texas Triangle
Gulf Coast
Piedmont Atlantic
Florida
Metro Area Population
150,000 to 1 million
1 to 3 million
3 to 6 million
6 million +
© 2008 by Regional Plan Association



Megaregional Development Issues -

1. Physical scarcity of water is a growing concern in Southern California, the Arizona Sun Corridor, and the Texas Triangle.
2. $534 billion in infrastructural improvements required to meet clean water / dinking water needs, operations and maintenance over the next 20 years.

Objectives –

1. Promote watershed management at the regional and megaregional scale that link water resource management to land use decisions.
2. Incentivize environmentally sound non-structural solutions for drinking water, sewage treatment, stormwater management and irrigation needs.
3. Develop / implement means of pricing ecosystem services so that the value of green infrastructure can be accounted for and managed appropriately.

Source: Regional Plan Association, *America 2050*.

The Practice of Sustainable Urbanism

Environmental Cities

Philosophy

Mission -

To serve as advocates for a healthy community and create livable spaces and places through sustainable practices and stewardship of our environment.

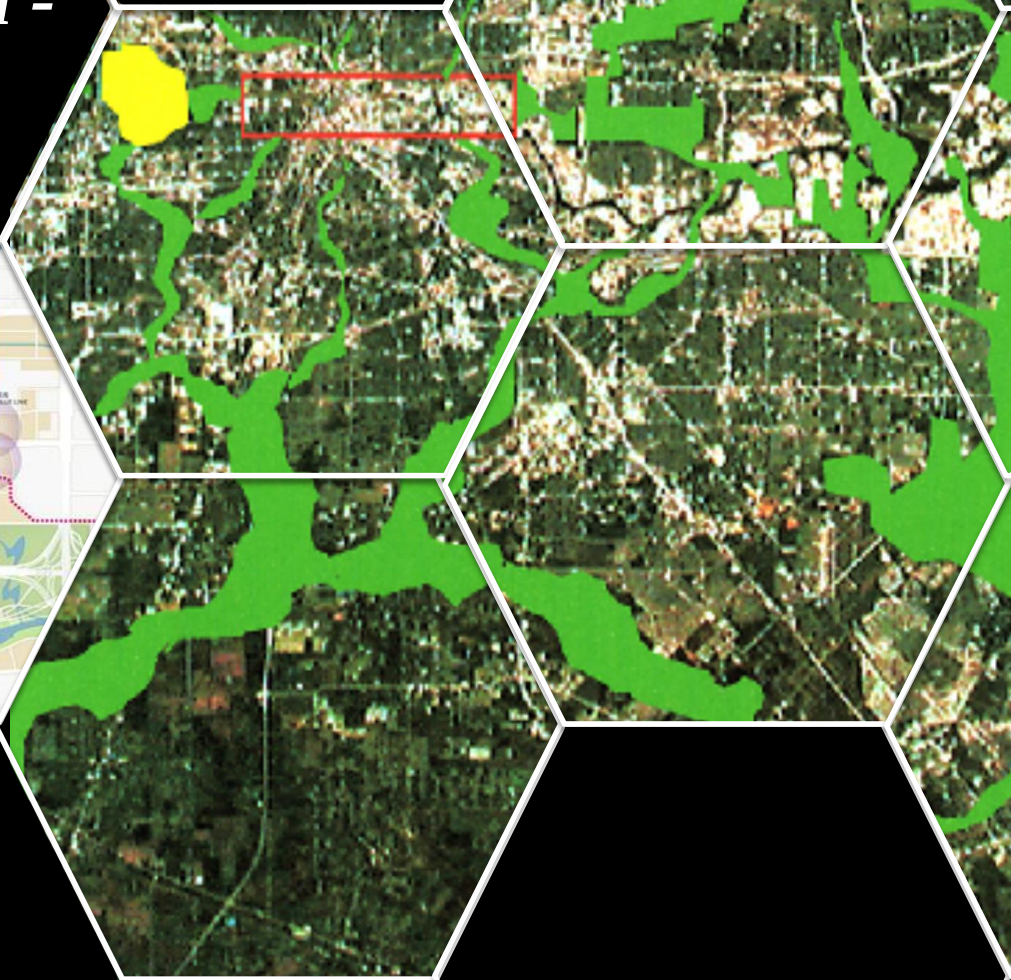
The Practice of Sustainable Urbanism

Environmental Cities

Philosophy

We Envision -

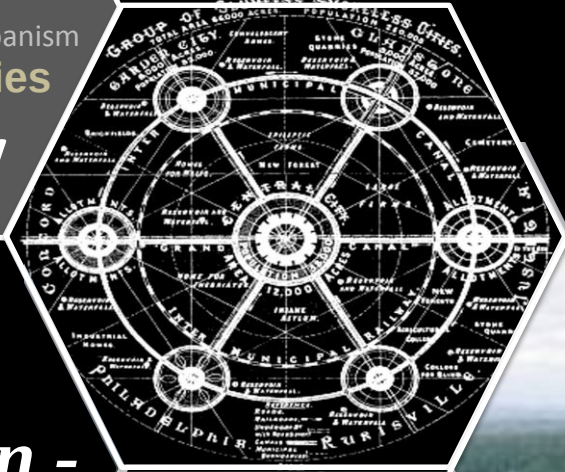
A City integrated within its regional context with efficient transportation systems and a network of **Green Infrastructure.**



The Practice of Sustainable Urbanism

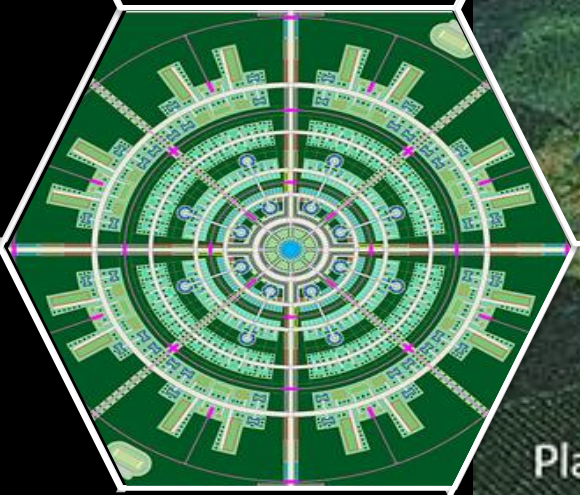
Environmental Cities

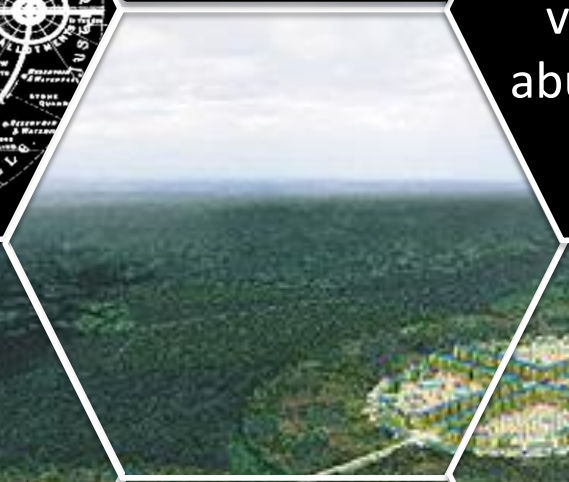
Philosophy

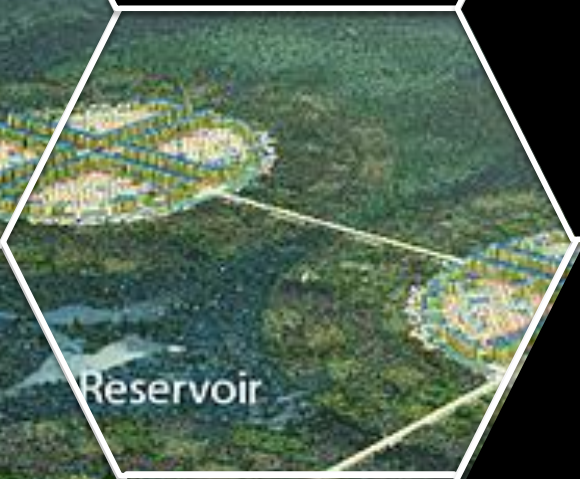


A City within a Garden. A Green City, enshrouded in vegetation, with abundant freshwater amenities.

We must Plan -







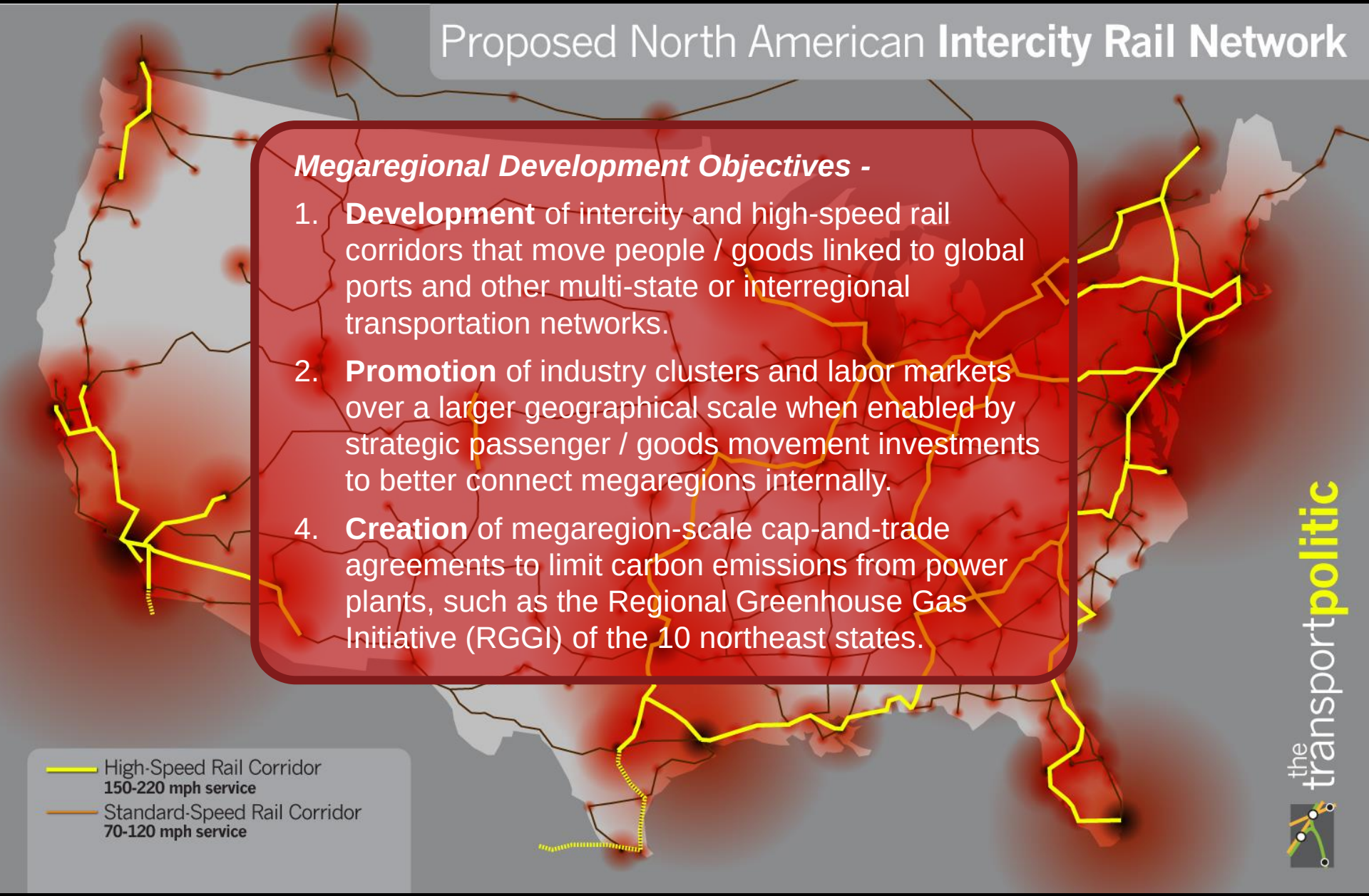
The Practice of Sustainable Urbanism

Environmental Cities

Philosophy

We must Plan -

Ecological Cities, where development is balanced with conservation of natural systems.


Proposed North American Intercity Rail Network
Megaregional Development Objectives -
1. Development of intercity and high-speed rail corridors that move people / goods linked to global ports and other multi-state or interregional transportation networks.
2. Promotion of industry clusters and labor markets over a larger geographical scale when enabled by strategic passenger / goods movement investments to better connect megaregions internally.
4. Creation of megaregion-scale cap-and-trade agreements to limit carbon emissions from power plants, such as the Regional Greenhouse Gas Initiative (RGGI) of the 10 northeast states.
High-Speed Rail Corridor
150-220 mph service
Standard-Speed Rail Corridor
70-120 mph service
the transportpolitic