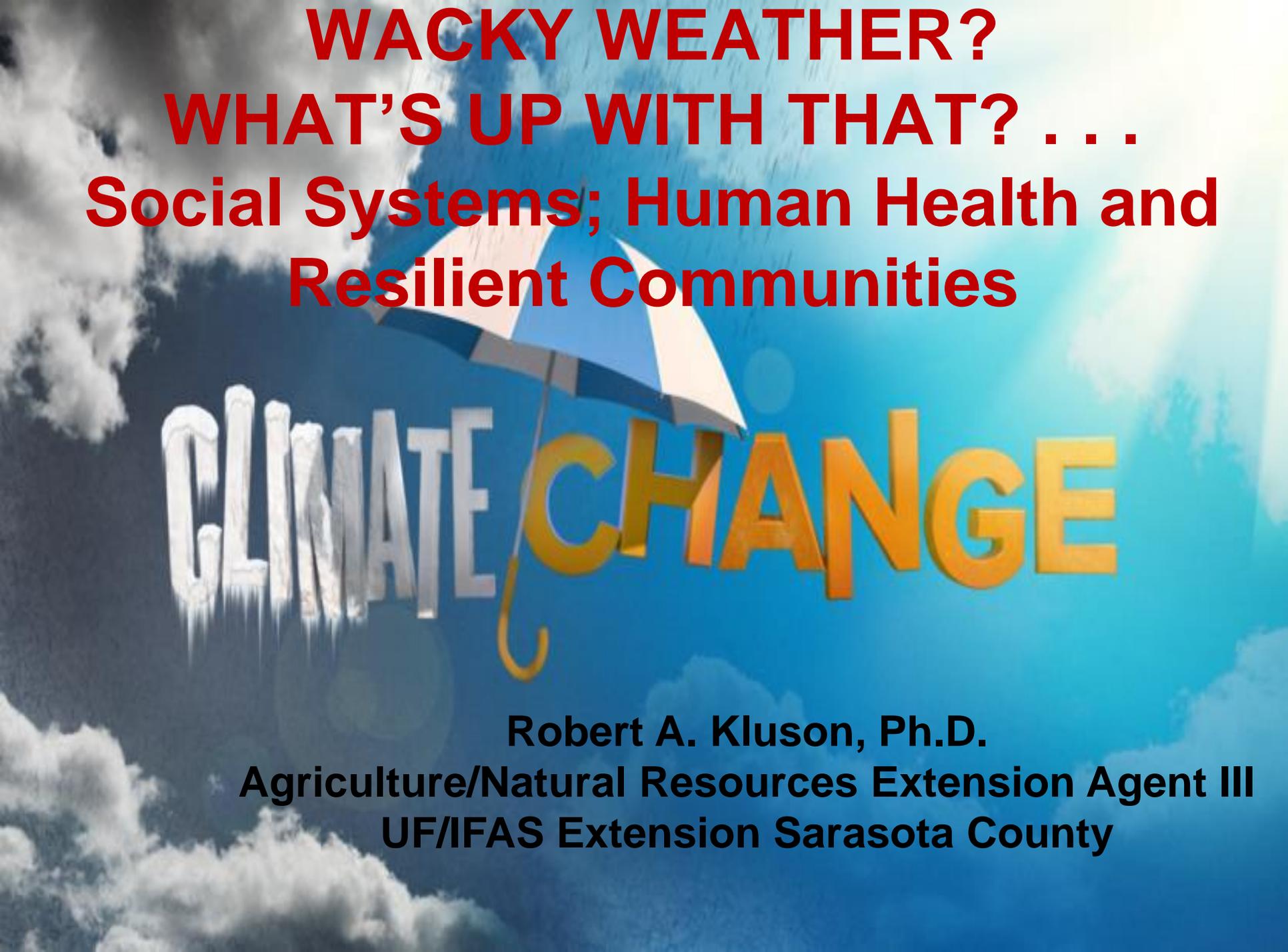


UF/IFAS Extension

The Journey to Sustainability Begins with Education



**WACKY WEATHER?
WHAT'S UP WITH THAT? . . .
Social Systems; Human Health and
Resilient Communities**



CLIMATE CHANGE

**Robert A. Kluson, Ph.D.
Agriculture/Natural Resources Extension Agent III
UF/IFAS Extension Sarasota County**

WACKY WEATHER WHAT'S UP WITH THAT? Climate Change Series

Topics In This Series:

- 1) Updates of Science of Climate Change
- 2) Impacts and Responses: Social Systems
Human Health and Resilient
Communities
- 3) Impacts and Responses: Agriculture
and Food Systems
- 4) Impacts and Responses: Biodiversity
and Ecosystems

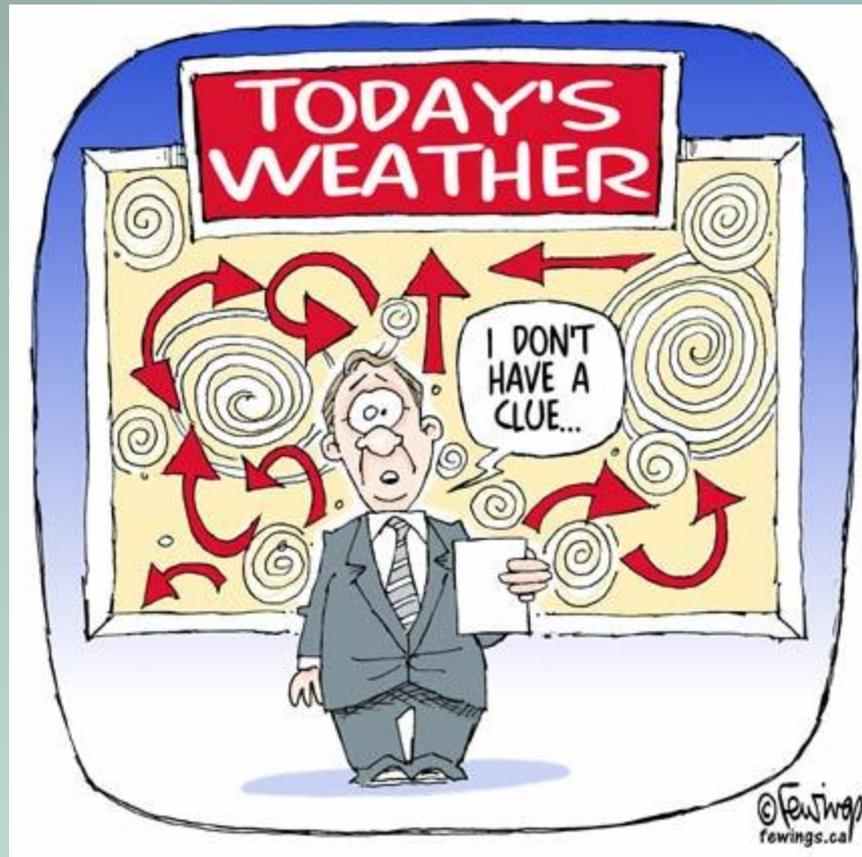


Today's
Topic

WACKY WEATHER?

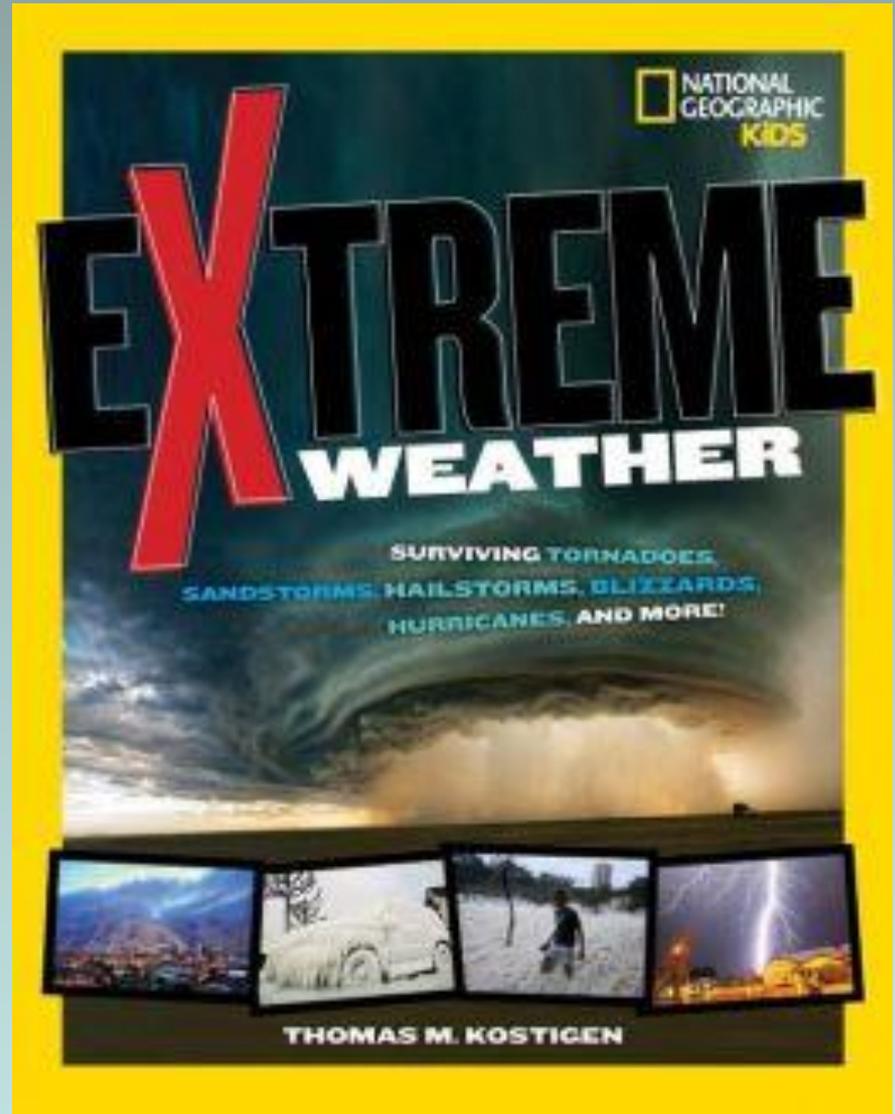
What Do You Mean?

Wacky . . . as in eccentric, crazy, erratic



“Extreme Weather” Events Are Wacky Weather

➤ By definition, extreme weather events are rare and based on a long record of observations and data to establish definitive links between severe events and climate change.



WACKY WEATHER?

WAIT A MINUTE! AREN'T WE SUPPOSE TO BE SERIOUS HERE?

WELL YES! BUT WHO SAYS THAT WE CAN'T MAINTAIN A SENSE OF HUMOR ABOUT SERIOUS MATTERS?

If I had no sense of humor, I would long ago have committed suicide.

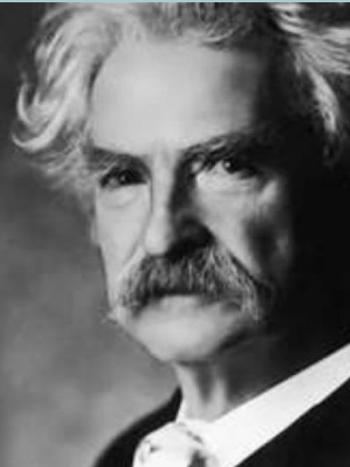
Mahatma Gandhi

A well-developed sense of humor is the pole that adds balance to your steps as you walk the tightrope of life.

William Arthur Ward

HUMOR IS
MANKIND'S
GREATEST
BLESSING.

Mark Twain



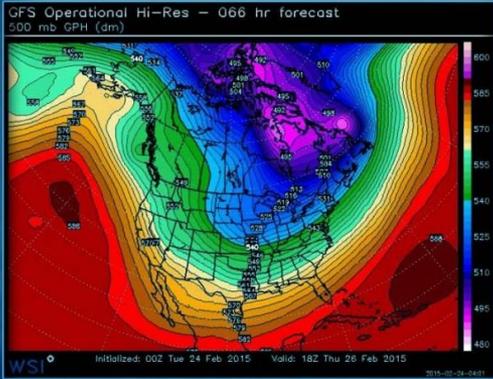
WACKY WEATHER?

Who Else Calls It 'Wacky Weather' ?



Skilling's Explainer

Winter 2014-15's wacky weather— from record snows in Boston to Great Lakes ice & record warmth/lack of snow in Alaska—one researcher's thought on what may be happening...



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Initialized: 00Z Tue 24 Feb 2015 Valid: 18Z Thu 26 Feb 2015
1015-01-24-0481

SCIENTISTS



SCIENTIFIC EXPLORER
Make your own Tornado! / Fais Ta propre Tornado! / ¡Crea Tu propio Tornado!
12+
WACKY WEIRD WEATHER KIT
Learn The Science of Storms! / Découvre La Science des Tempêtes! / Descubre La ciencia de las Tormentas!
Create Lightning in your home! / Crée des éclairs dans Ta maison! / ¡Crea rayos en Tu casa!
Create your own Tidal Wave! / Crée ton propre raz de marée! / ¡Crea tu propio maremoto!
7 ACTIVITIES! / ACTIVIDADES! / ACTIVIDADES!
Contents:
- 1x Tide Tube with Cap
- 2x Color Tablets
- 2x Elastic Strips
- 1x Storm Connector - 13 Bands
- 1x Stormy Weather Strips - 2x 1/4" x 1/4" x 1/4" Strips
- 1x Stormy Weather Strips - 2x 1/4" x 1/4" x 1/4" Strips
- 1x Stormy Weather Strips - 2x 1/4" x 1/4" x 1/4" Strips
© 2011 AME, 501 1/4 St. Activity Guide

EDUCATORS

The New York Times

“Making Sense of the Wacky Weather”
By JUSTIN GILLIS MARCH 30, 2012

MEDIA

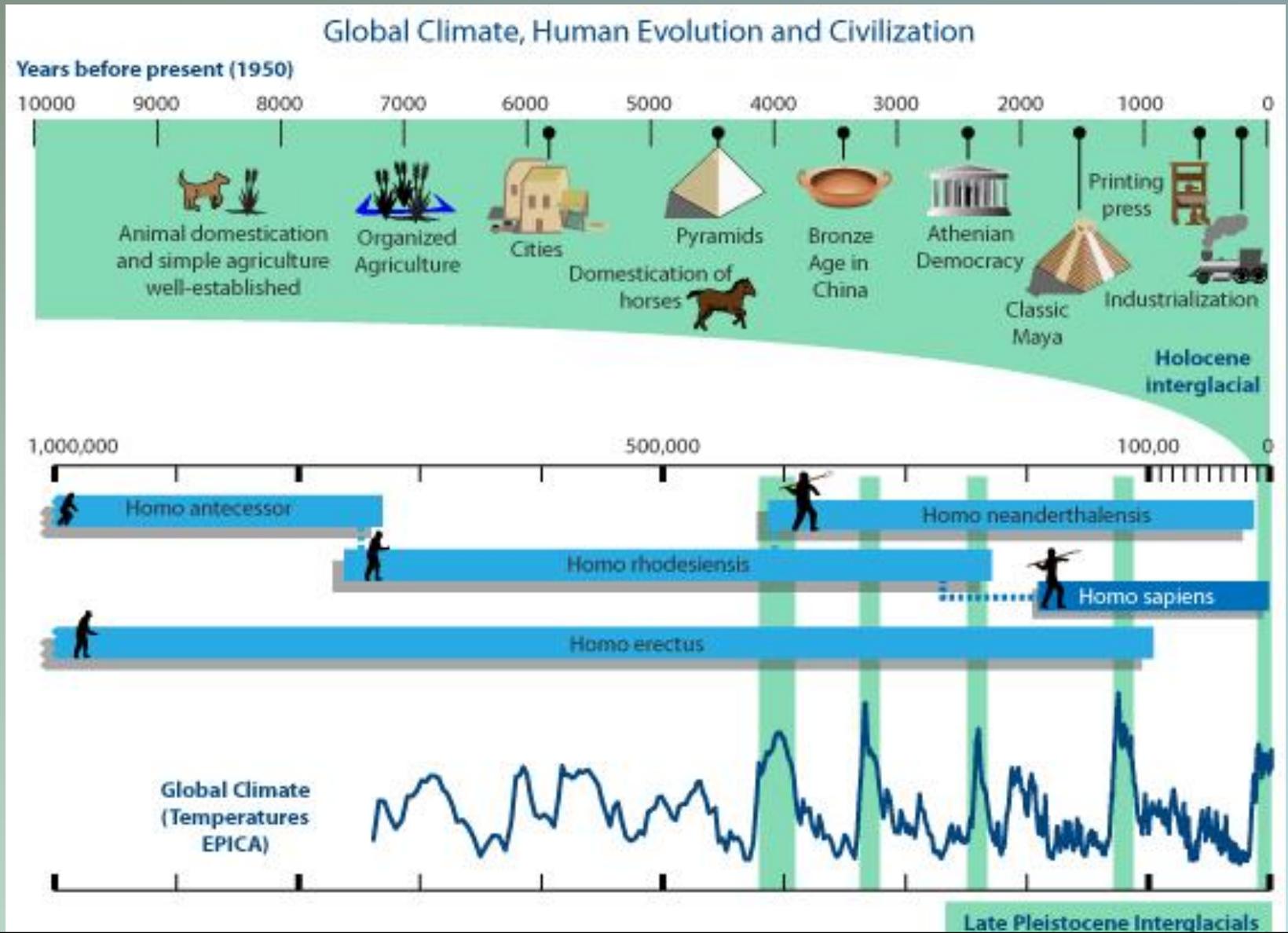


The Wacky Side of Climate Change...



See the video at <http://bigthink.com/big-think-tv/neil-degrasse-tyson-gets-the-snl-treatment> (go to the setting 2:48)

The Social Faces of Climate Change

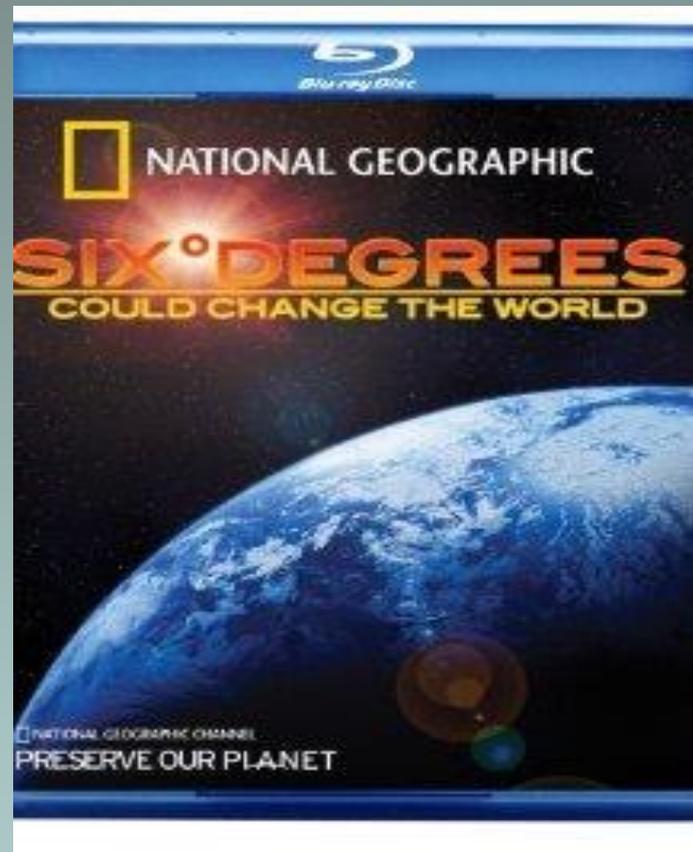


The Social Faces of Climate Change

Global Climate, Human Evolution and Civilization

- ❖ The human species evolved during the last 2.5 million years. Our far distant ancestors survived through multiple gradual cycles of cold ice ages, but did not experience any previous “hot ages.”
- ❖ The warmest period ever experienced by early humans was [at most] about 1 °C warmer (global average) than today.
- ❖ Modern society has developed entirely in our current geological epoch, the Holocene. Global temperatures haven't varied by more than ± 1 °C since.
- ❖ Since humans and our human ancestors have been on Earth, average global temperatures have never been 3 °C warmer than now. In the next 100 years our children will be the first people ever to experience that kind of climate

The Social Faces of Climate Change



See the video 'Six Degrees Could Change the World; at <http://natgeotv.com/asia/six-degrees/videos/six-degrees-1>

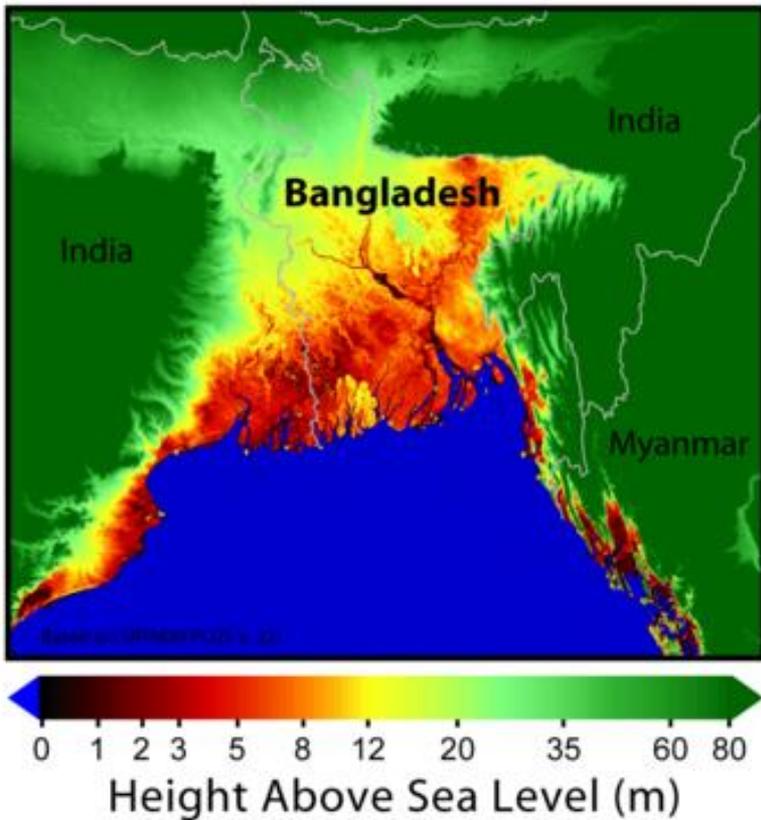


See the video 'Five Degrees Warmer: Civilization Collapses' at <https://www.youtube.com/watch?v=7nRf2RTqANg>



The Social Faces of Climate Change

Sea Level Risks - Bangladesh



See the videos 'Climate Migration' (up to setting 12:38) and 'Floating Hospital of Bangladesh' of 'Years of Living Dangerously' series at Access Video of Sarasota County Library at <http://sarac.co.sarasota.fl.us/>

The Social Faces of Climate Change

Kiribati, South Pacific



See the Youtube video -
<https://www.youtube.com/watch?v=Xx4leLu8DwM>

The Social Faces of Climate Change

Climate Refugees

- ❖ The coming decades, the World Bank predicts, will see political instability, food shortages, & famine, leading to the displacement of millions of people. South Asia's heavily populated coasts, particularly those in Bangladesh & Vietnam, could be inundated
- ❖ But it is a term South Pacific leaders, whose nations could disappear, say is loaded with political connotations & does not reflect the true dimensions of the problem. For them it signifies a negative term & that they've become people who aren't able to contribute. They would like to have opportunities to migrate with dignity rather than have to wait until the situation becomes so dire that we are forcibly displaced'.

<http://ngm.nationalgeographic.com/2015/02/climate-change-economics/parker-text>

<http://www.abc.net.au/news/2014-09-05/pacific-islanders-reject-calls-for-27climate-refugee27-status/5723078>

First, Some Definitions . . .

- ❖ **Weather**
 - basically the way the atmosphere is behaving, mainly with respect to its effects upon life and human activities over a short period of time.
- ❖ **Climate**
 - the average of weather over time and space over relatively long periods of time.
- ❖ **The difference between weather and climate is a measure of time.**

See the video at https://www.youtube.com/watch?v=cBdxDFpDp_k



First, Some Definitions . . .

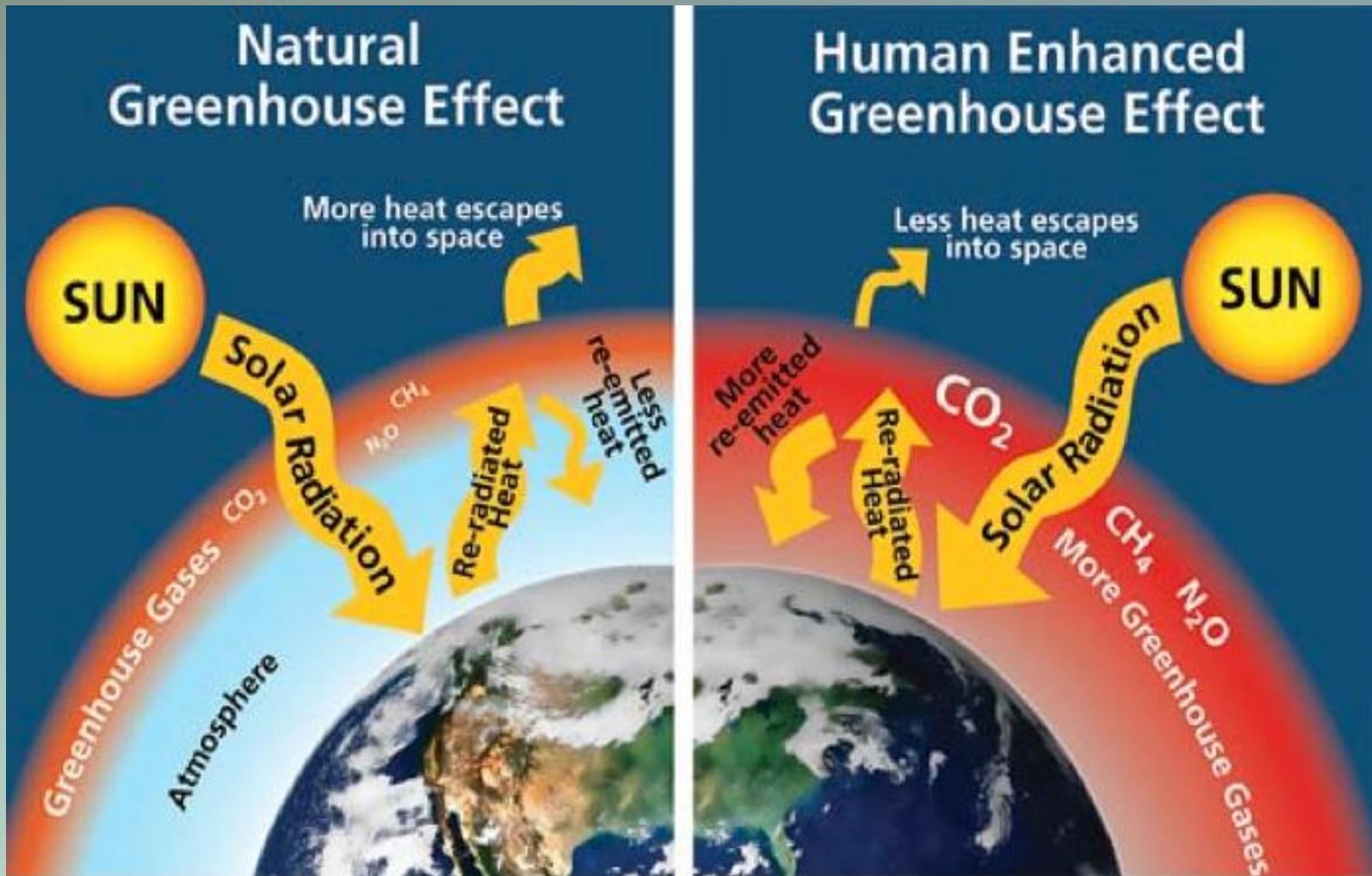
- **Global Warming**

- an increase in average global temperature as influenced by increased greenhouse gas concentrations without regard to other factors that may cause climate change

- **Climate Change**

- changes in the atmosphere over time scales ranging from weeks to decades to millions of years.
 - vary by natural processes internal to the Earth (e.g., continental drift), external forces (e.g., solar energy), and human activities which affect global wind patterns, rainfall, and temperatures.

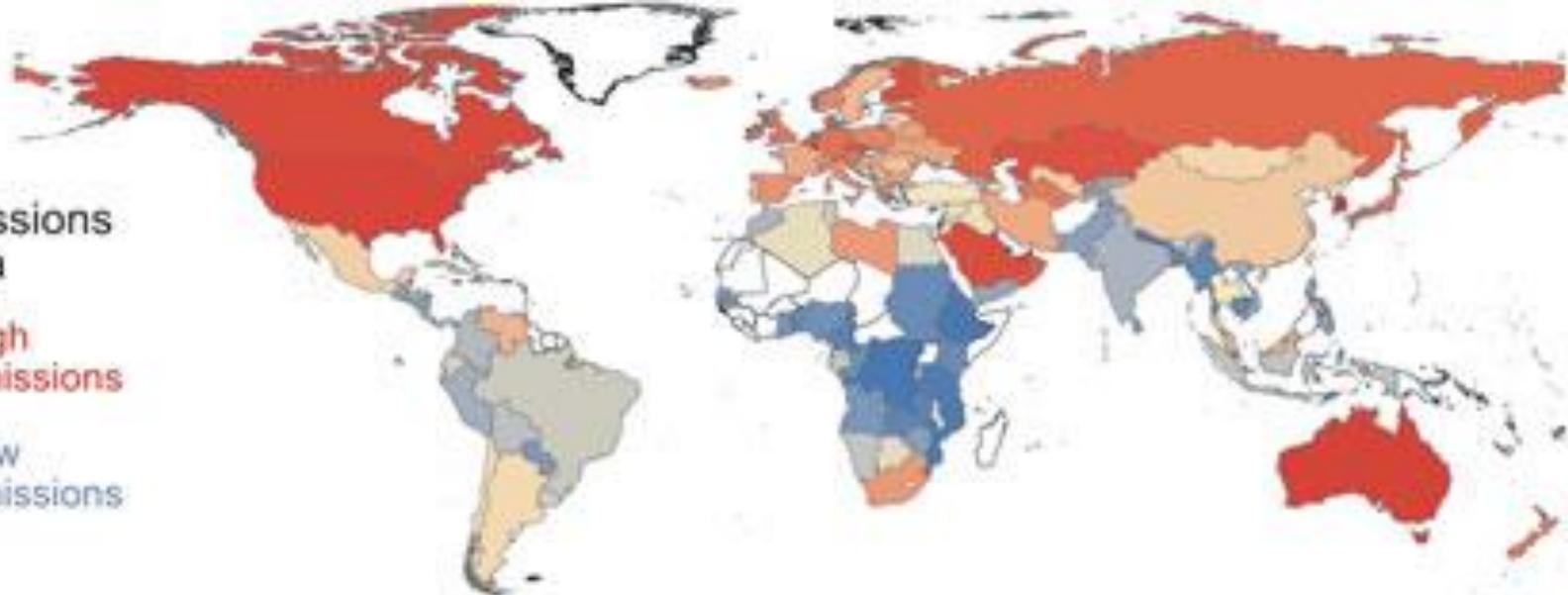
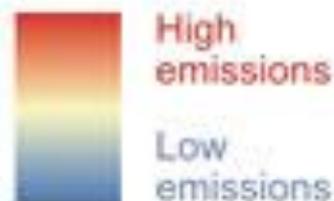
Global Warming System Definition



See the video at <https://www.youtube.com/watch?v=6VUPIX7yEOM>

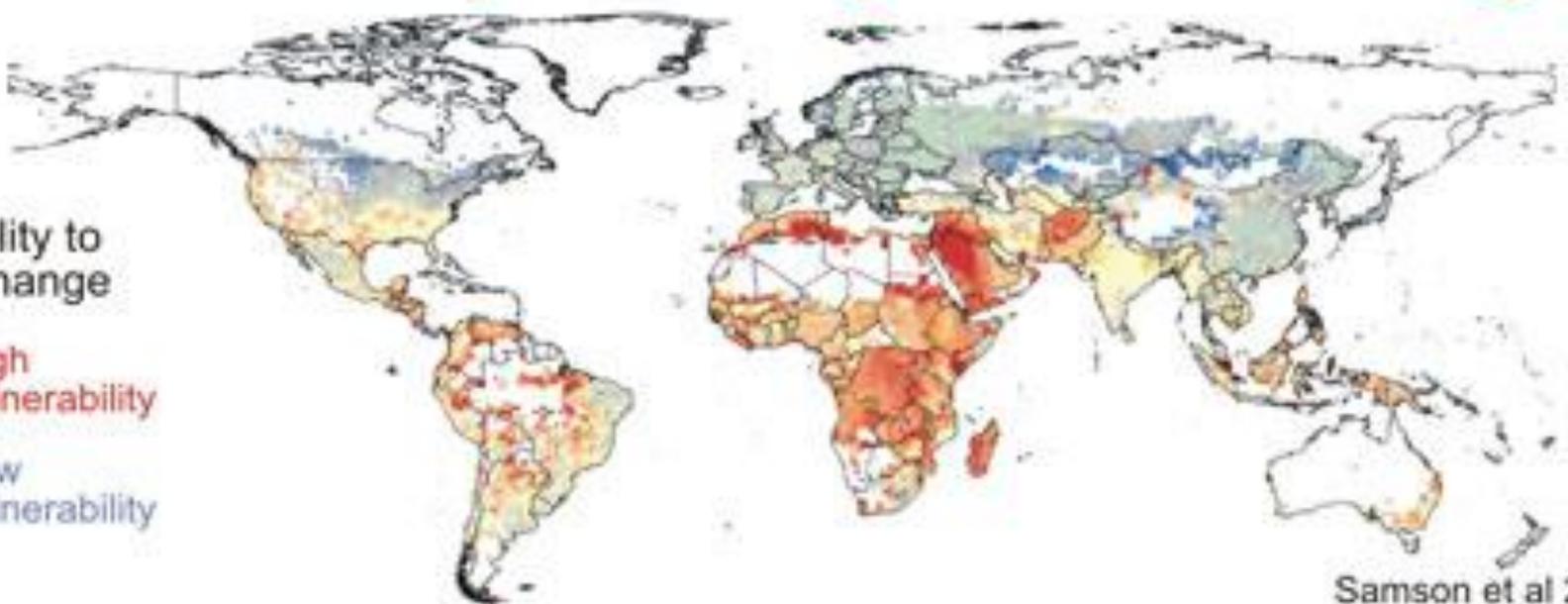


CO2 emissions
per capita

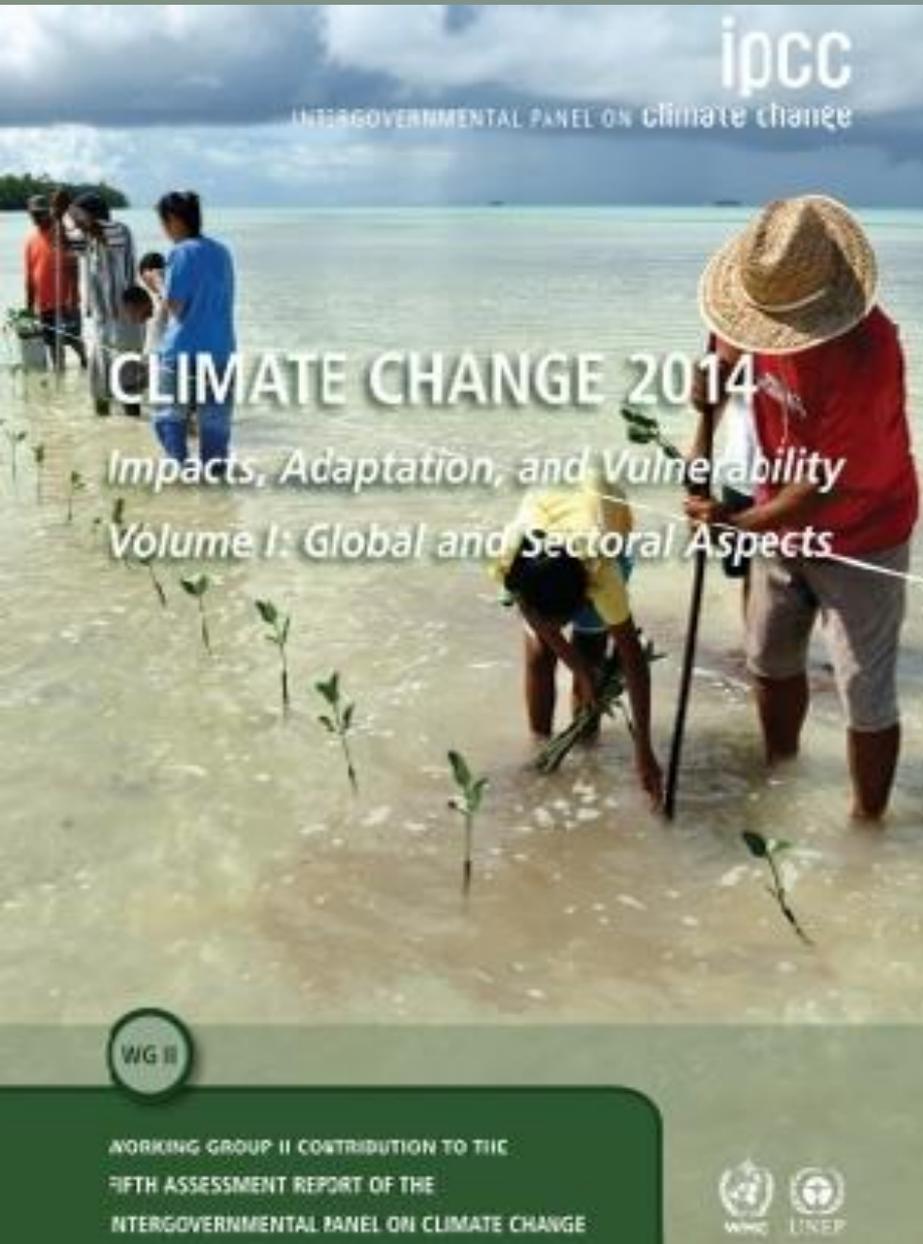


Those who contribute the least greenhouse gases
will be most impacted by climate change

Vulnerability to
climate change



Who Says So ?

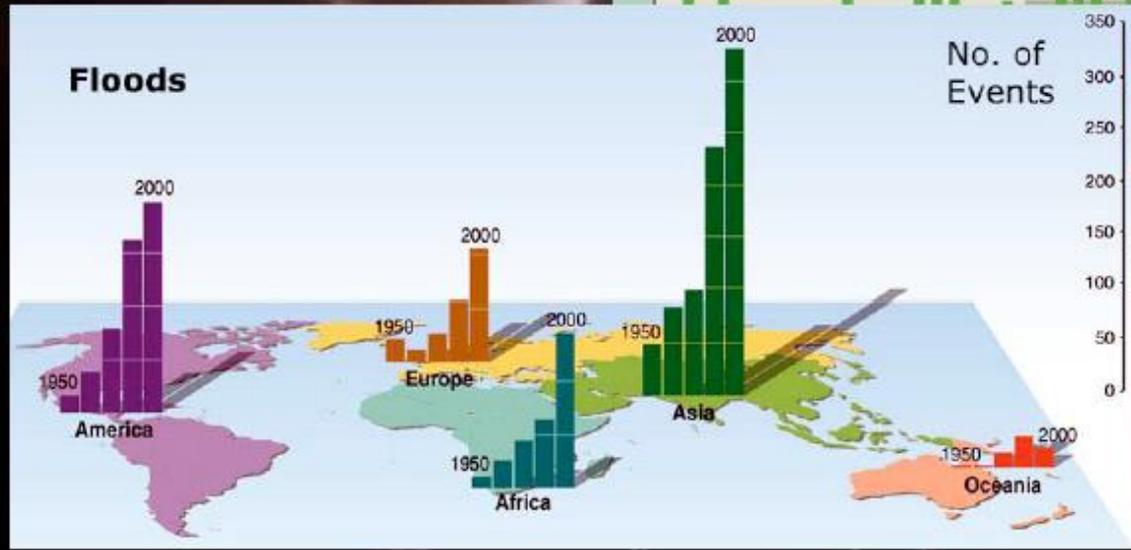
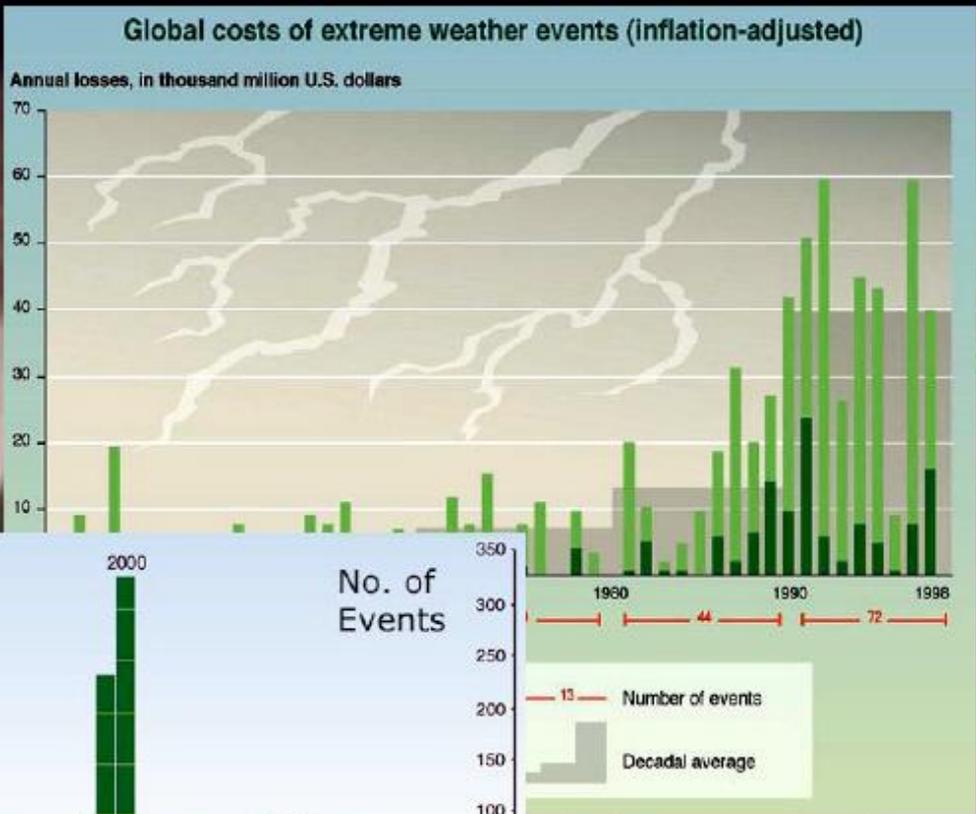


- Intergovernmental Panel on Climate Change (IPCC)
- Scientific body under auspices of the U.N.
- Currently 195 countries have scientist panel members
- Reports endorsed by Science Academy & government of all panel member countries
- Fifth Assessment Report (AR5) released in 2014

<http://www.ipcc.ch/>

What does *this* Global Warming mean?

*Consequences:
extreme
weather*



What Does *this* Change in Climate Mean?

“Many of the world's climate zones may disappear by 2100, leaving new ones in their place unlike any that exist today”

“..we are going to be seeing climates that certainly are completely outside the range of modern human experience..”

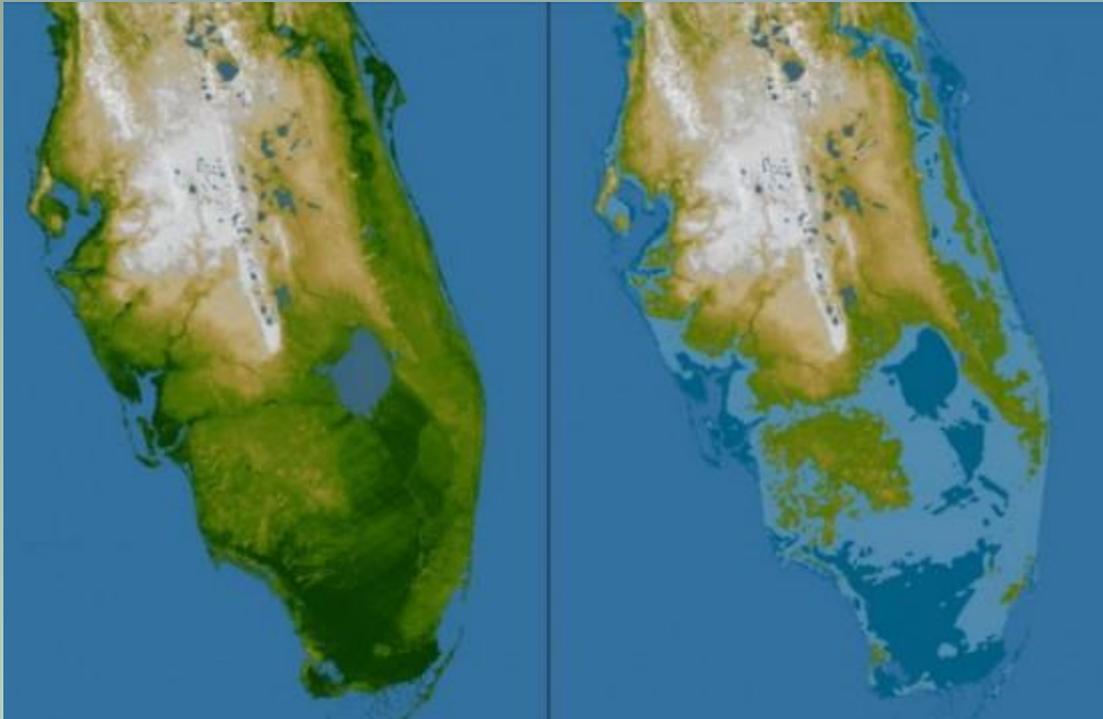
Source 2007 Articles: 26 March *Scientific American*; 27 March *Guardian*; 27 March IOL Reuters

What Does *this* Change in Climate Mean?

- **Climate change computer models predict a range of sea level rises for different locations due to the global warming and melting of glaciers worldwide**
- **These models also predict more frequent extreme weather conditions that will produce heavy rains and flooding to many parts of the country**

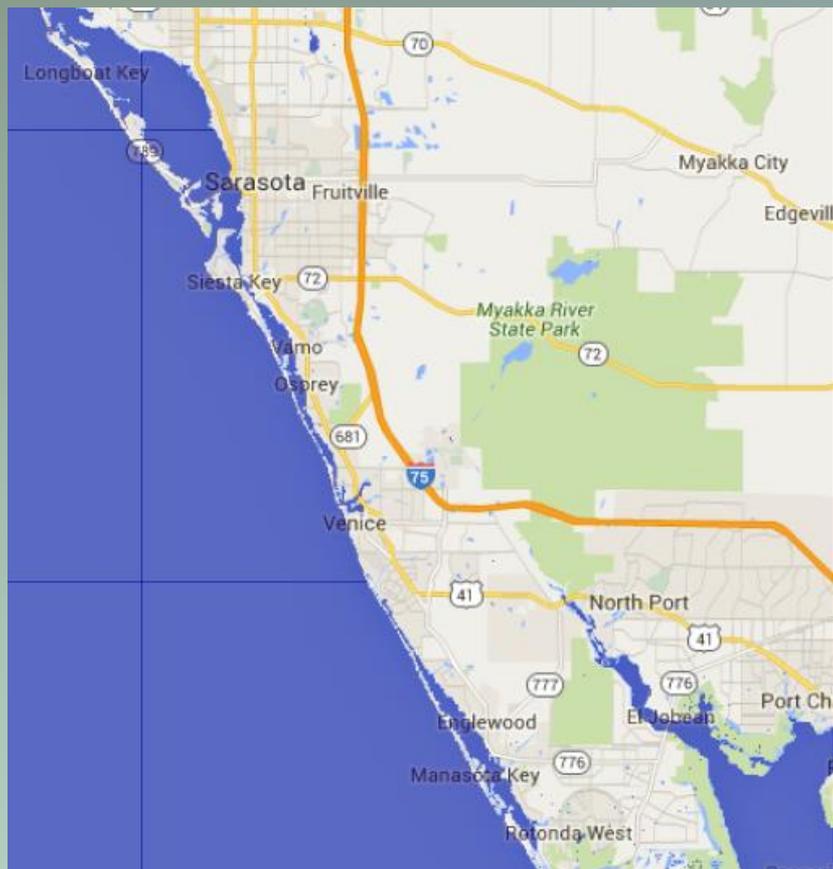
Viewing FL Sea Level Rise Impacts

- Online Flood Model Maps can be used to simulate rising sea levels anywhere in the world, including counties in Florida

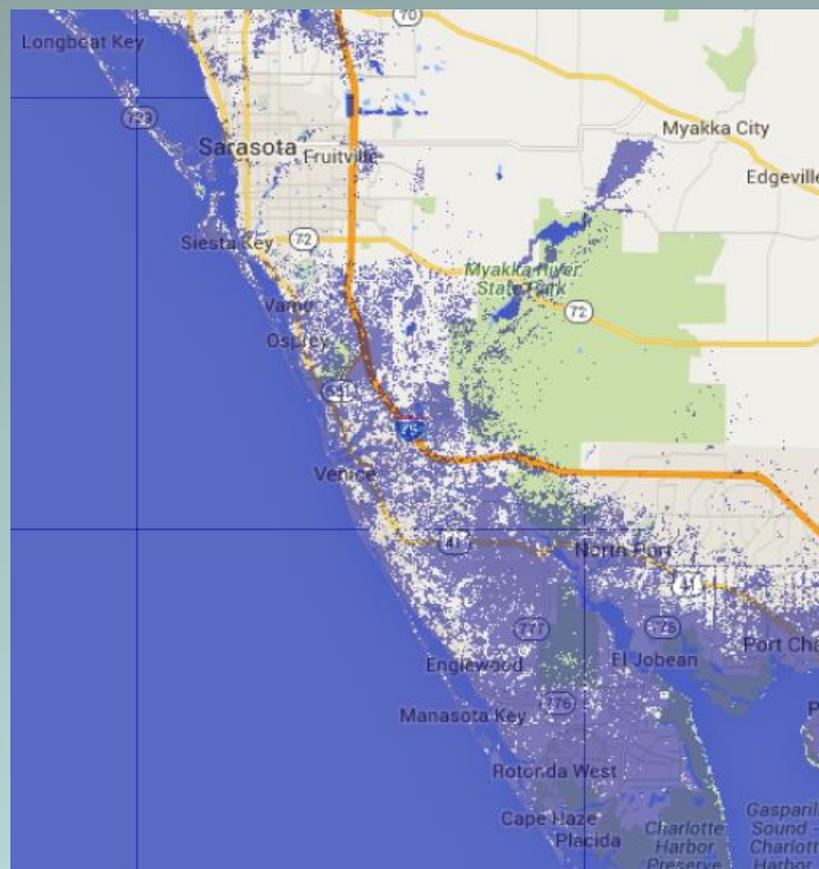


- Potential land mass impacts in FL w/ 23 ft sea level rise shown.
- Enough global ice sheet mass exists for a 213 ft sea level rise.

Viewing Sea Level Rise Impacts in Sarasota County



Present



23 Ft Sea Level Rise



<http://coast.noaa.gov/slr/>

Viewing FL Sea Level Rise Impacts

South Florida, USA

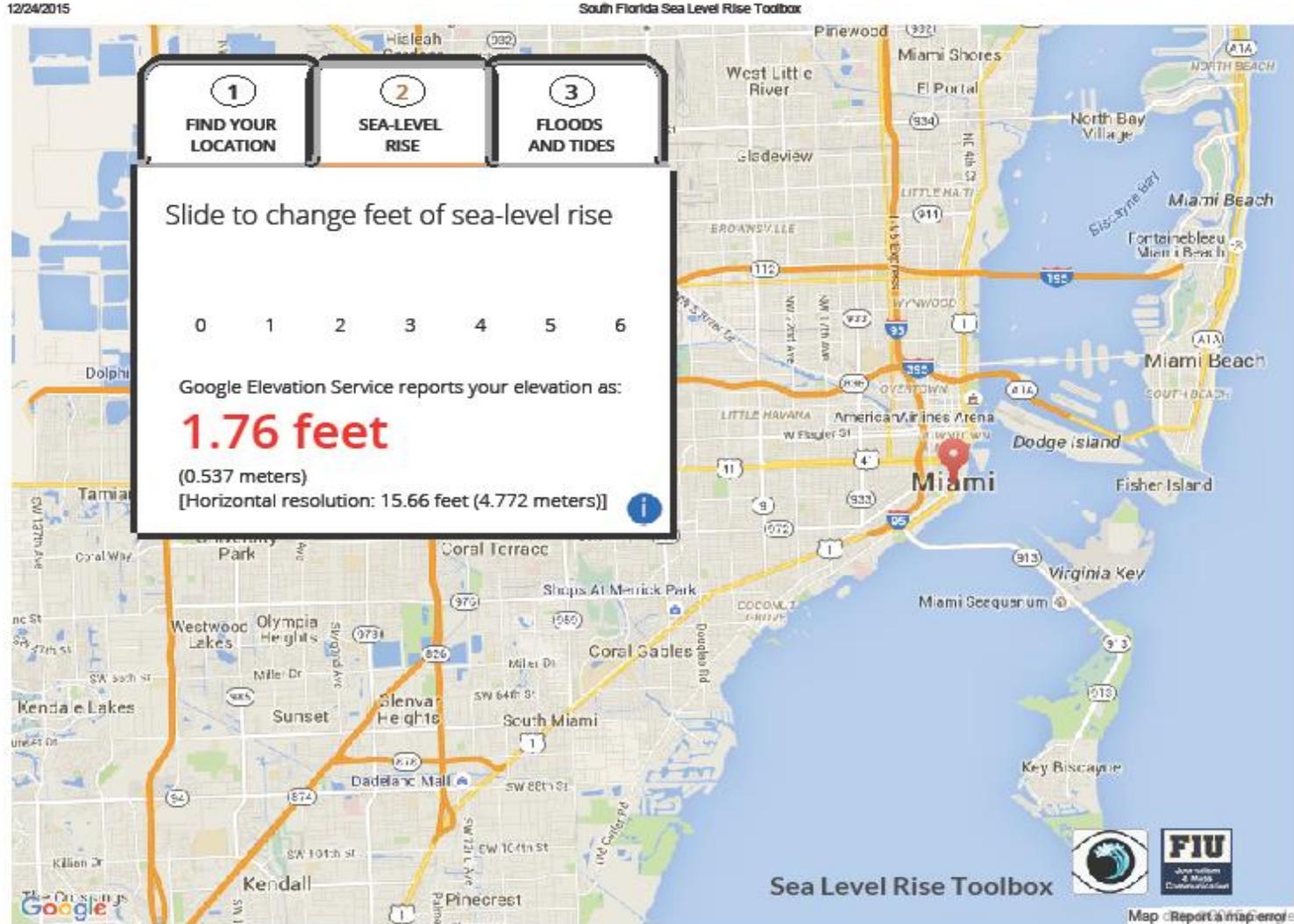
Miami Beach downtown



See the Youtube video at
<https://www.youtube.com/watch?v=-JbzypWJk64>

Viewing FL Sea Level Rise Impacts

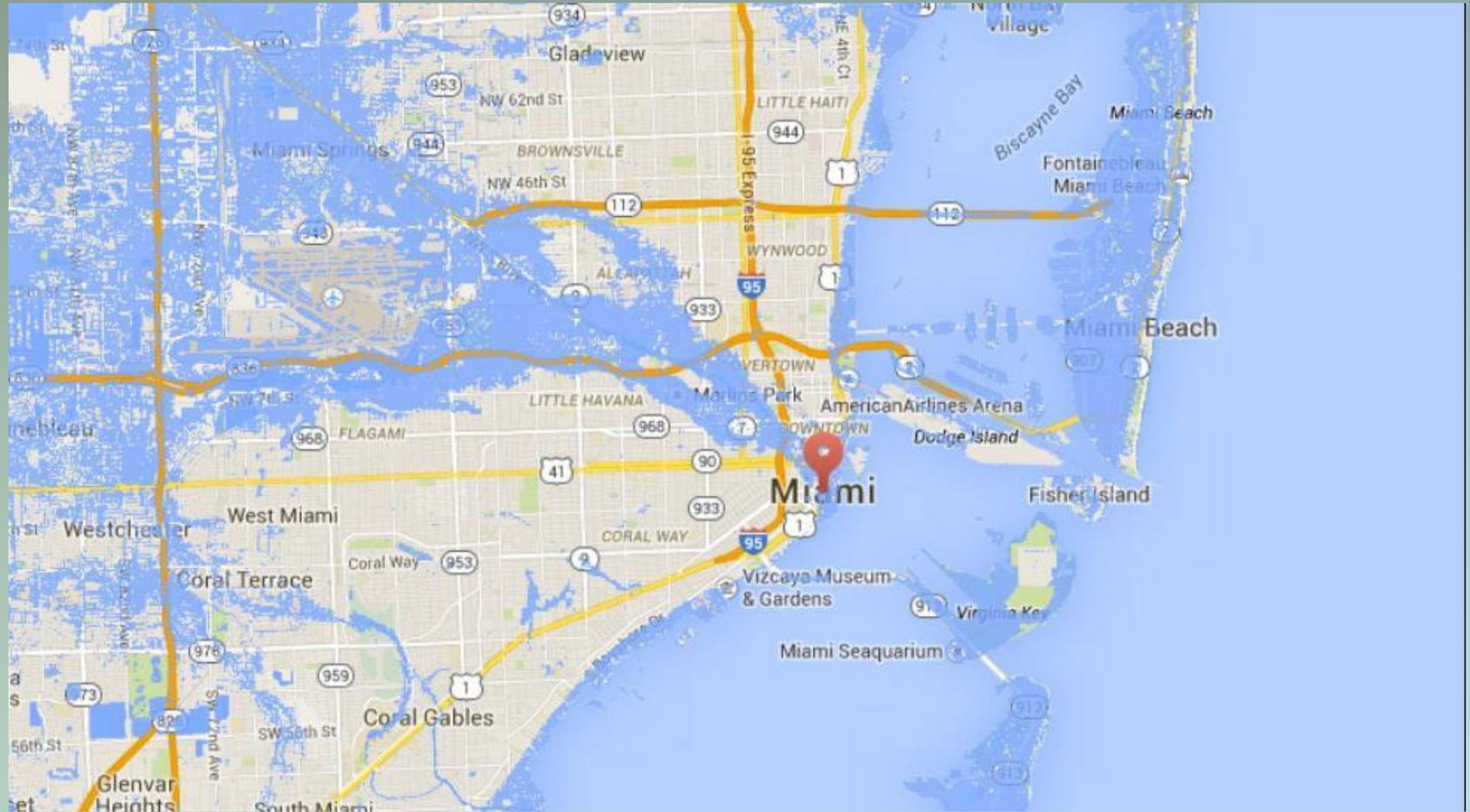
Miami, FL, Area at 2015 Sea Level



See the online App at
<http://eyesontherise.org/app/#tab2>

Viewing FL Sea Level Rise Impacts

Miami, FL, Area With 6 Ft Sea Level Rise



See the online App at
<http://eyesontherise.org/app/#tab2>

Viewing Sea Level Rise Impacts in Sarasota County

Island Park, Downtown City of Sarasota



Present (2015)



2 Ft Sea Level Rise
(2035)

<http://coast.noaa.gov/slr/>

Viewing Sea Level Rise Impacts in Sarasota County

Island Park, Downtown City of Sarasota



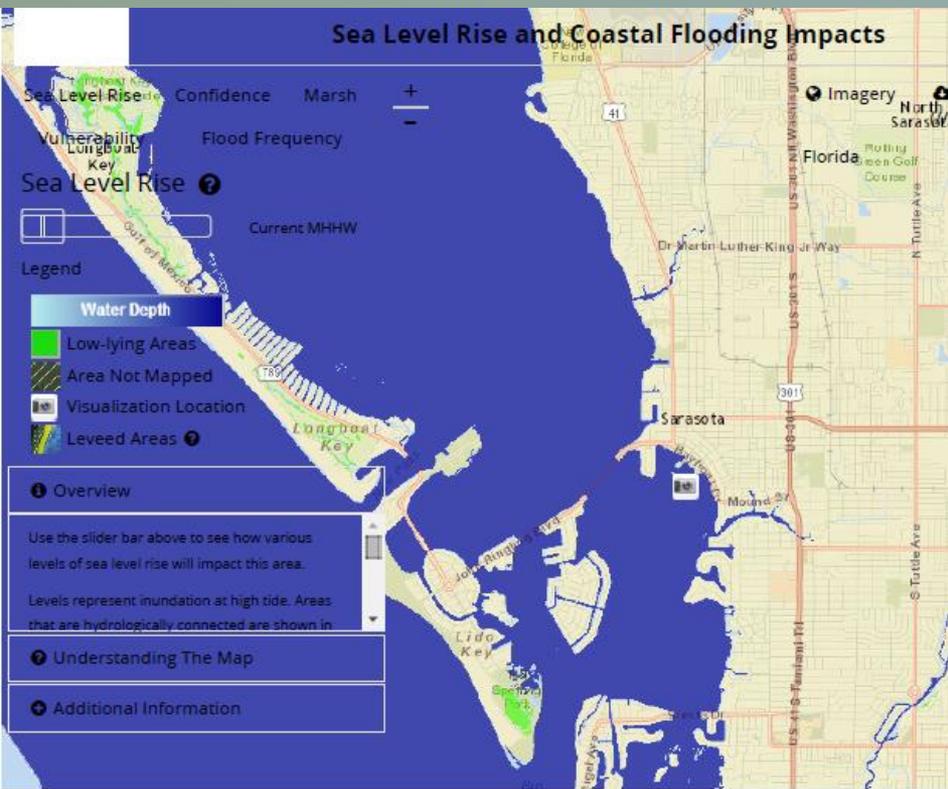
4 Ft Sea Level Rise
(2055)



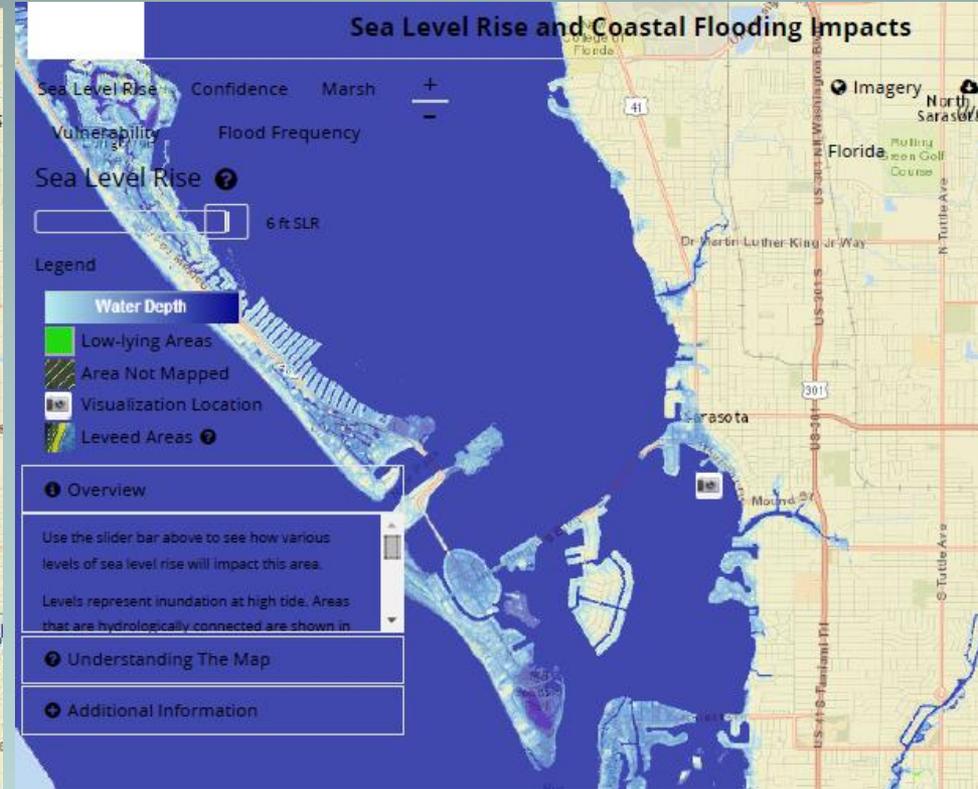
6 Ft Sea Level Rise
(2075)

<http://coast.noaa.gov/slr/>

Viewing Sea Level Rise Impacts in City of Sarasota,, FL



Present Sea Level



6 Ft Sea Level Rise



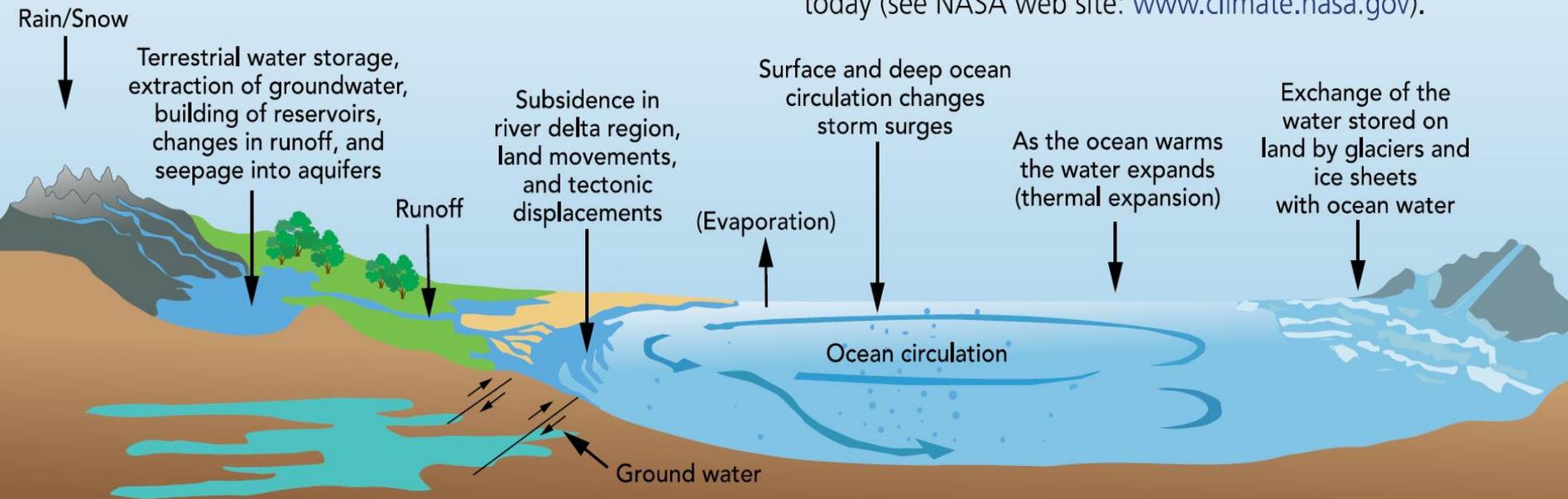
<http://coast.noaa.gov/slr/>

Sea Level Rise Science

WHAT CAUSES SEA LEVELS TO CHANGE

Sea levels on Earth change with the climate. Global sea levels have fluctuated throughout our planet's history as it goes through cooling and warming spells. Some scientists estimate the range of change by as much as +/- 300 feet from the present level (Donoghue, 2011).

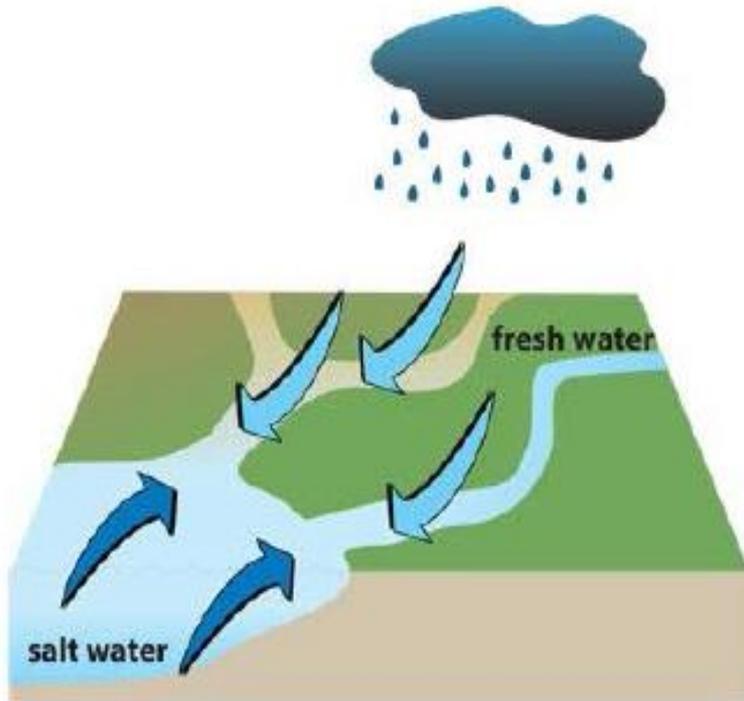
According to NASA scientists, during the last ice age (about 18,000 years ago) global average sea levels were as much as +/-350 feet below today's levels. During the last warm interval (about 125,000 years ago) global average sea levels were 9 feet to 18 feet higher than today (see NASA web site: www.climate.nasa.gov).



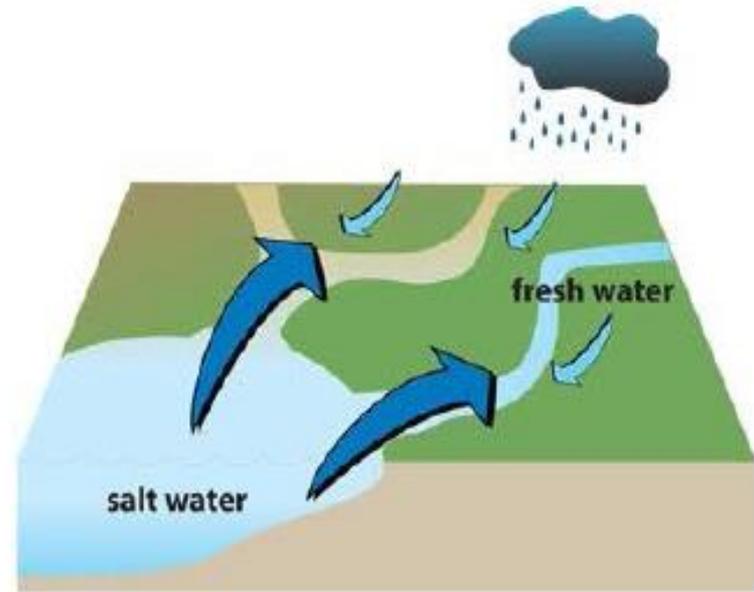
FACTORS AFFECTING SEA LEVELS AND SEA LEVEL CHANGE

<http://sarasotabay.org/documents/Sea-Level-Rise-Brochure-2014.pdf>

Sea Level Rise & Surge Impacts to Coastal Communities in FL



Current

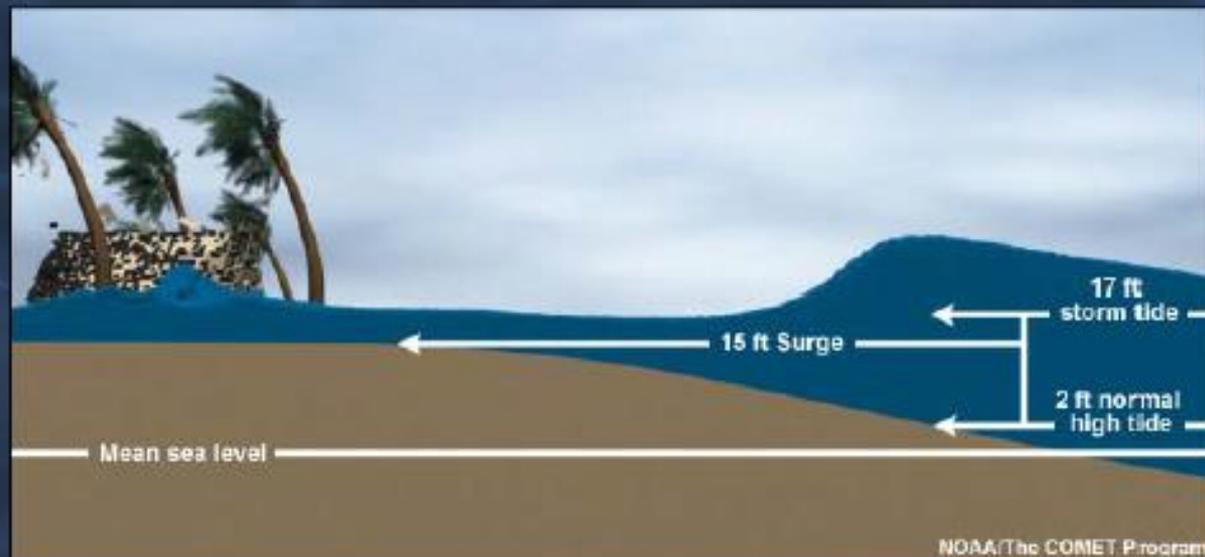


With Sea-Level Rise

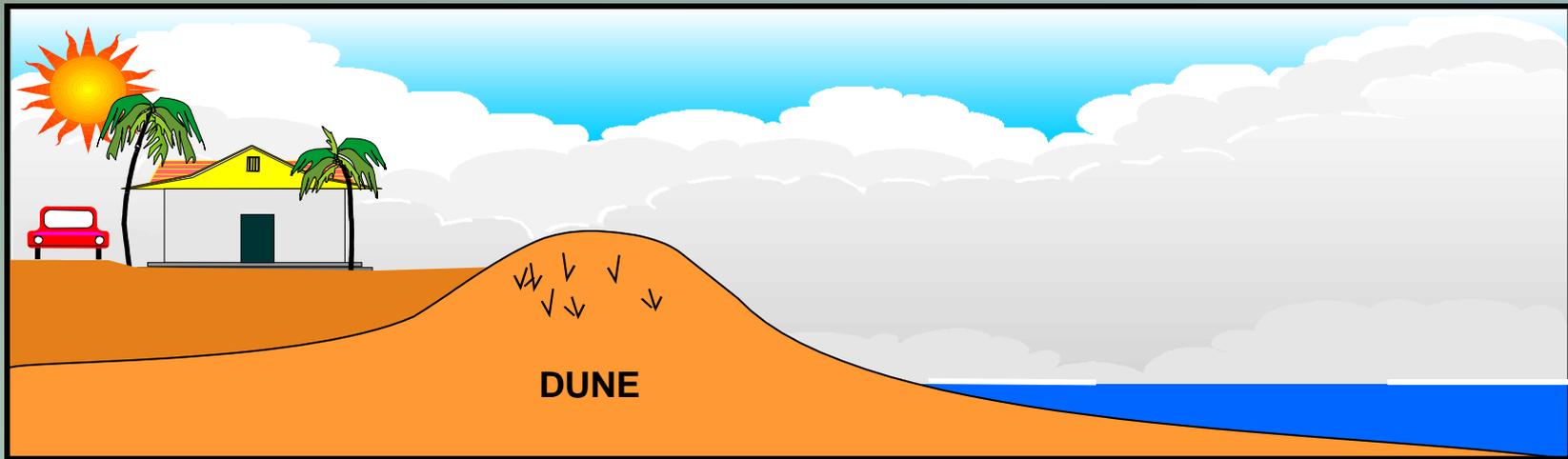
What is Storm Surge?

STORM SURGE is an abnormal rise of water generated by a storm, over and above the predicted astronomical tide.

STORM TIDE is the water level rise during a storm due to the combination of storm surge and the astronomical tide

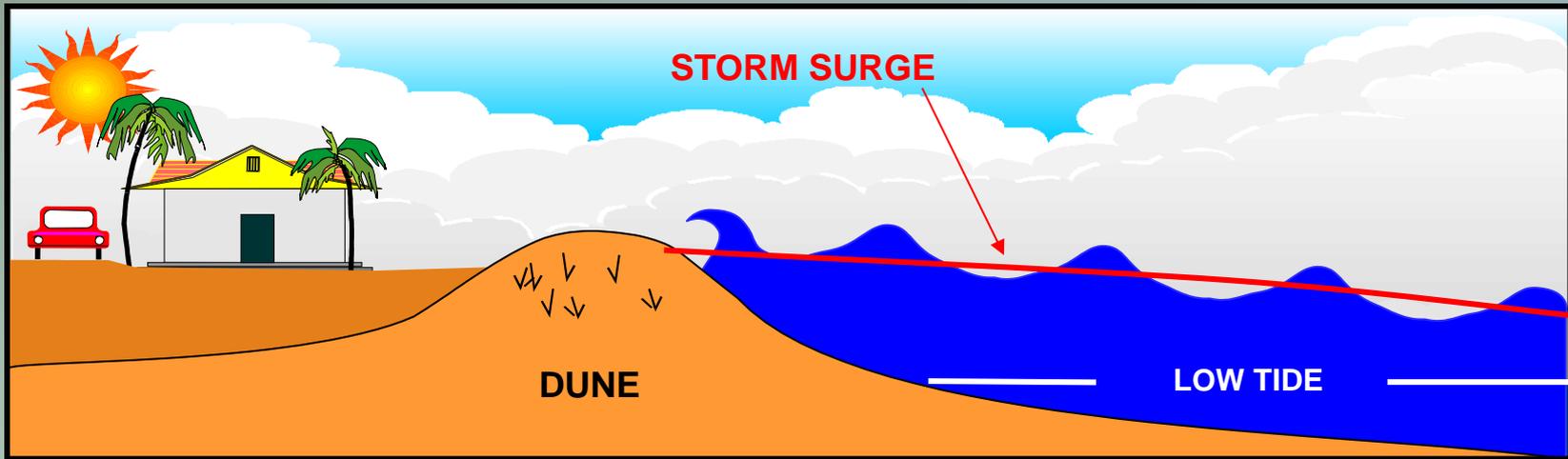


Tide with Storm Surge



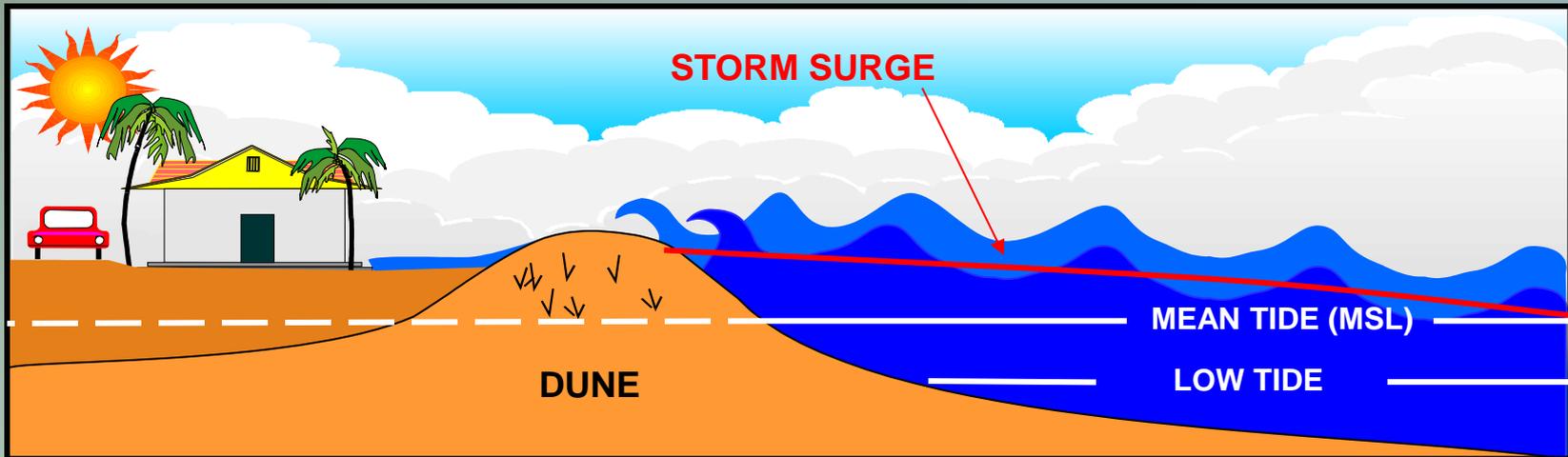
www.hazardscaucus.org/briefings/Gray1105.ppt

Tide with Storm Surge



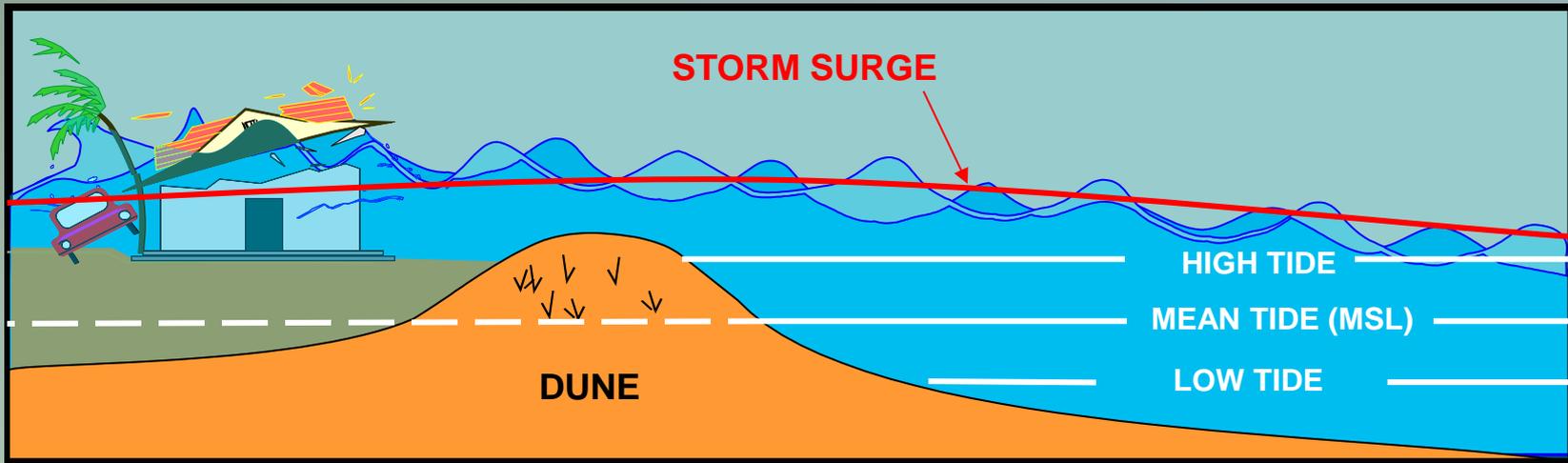
www.hazardscaucus.org/briefings/Gray1105.ppt

Tide with Storm Surge



www.hazardscaucus.org/briefings/Gray1105.ppt

Tide with Storm Surge



www.hazardscaucus.org/briefings/Gray1105.ppt

GENERALIZATIONS:

- The higher the hurricane's category, the higher the storm surge.
- Maximum storm surge occurs to the right of the storm track, roughly at the radius of max winds.
- Faster-moving hurricanes cause higher surges **AT THE COASTLINE** than do slower-moving hurricanes.

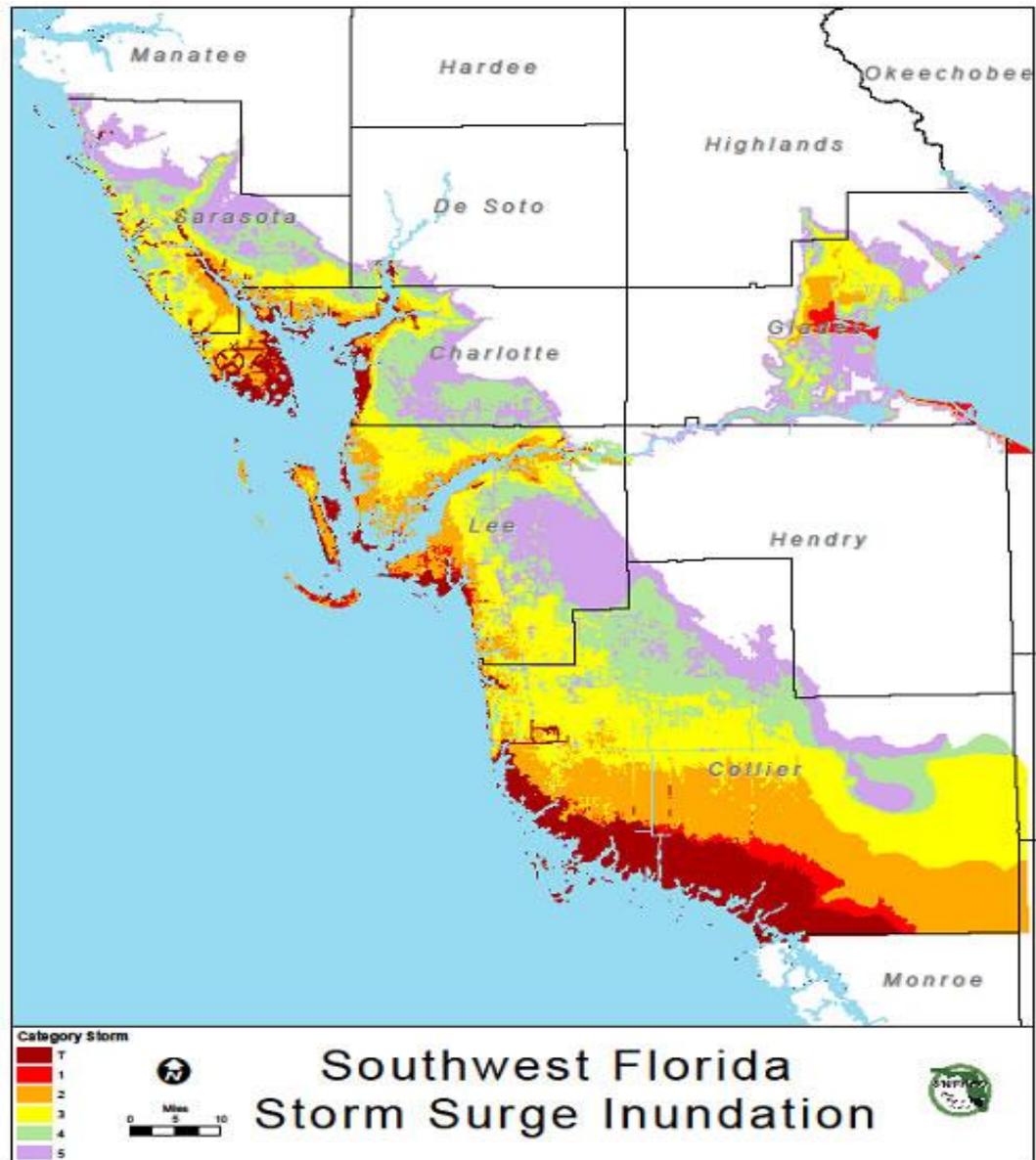
GENERALIZATIONS (Cont.):

- For areas with gentle slopes of the continental shelf, storm surge is large but waves are small.
- Areas with deep water just offshore experience large waves, but little storm surge.
- Very small, compact hurricanes cause less storm surge than do large-sized hurricanes.

Storm Surge Impacts to SW FL Coastal Communities



See Interactive Viewer at
<http://noaa.maps.arcgis.com/apps/StorytellingTextLegend/index.html?appid=b1a20ab5eec149058bafc059635a82ee>



<http://www.nbc-2.com/story/13599935/2010/12/01/new-storm-surge-maps-put-more-of-swfl-in-danger-zone>

Storm Surge Impacts of Category 5 Hurricane to Sarasota County, FL

Category 5 Storm Surge Inundation (SLOSH Maximum of Maximums)

With this education and awareness tool, anyone living in hurricane-prone coastal areas along the U.S. East and Gulf Coasts can now evaluate their own unique risk to storm surge. This map makes it clear that storm surge is not just a beachfront problem, with

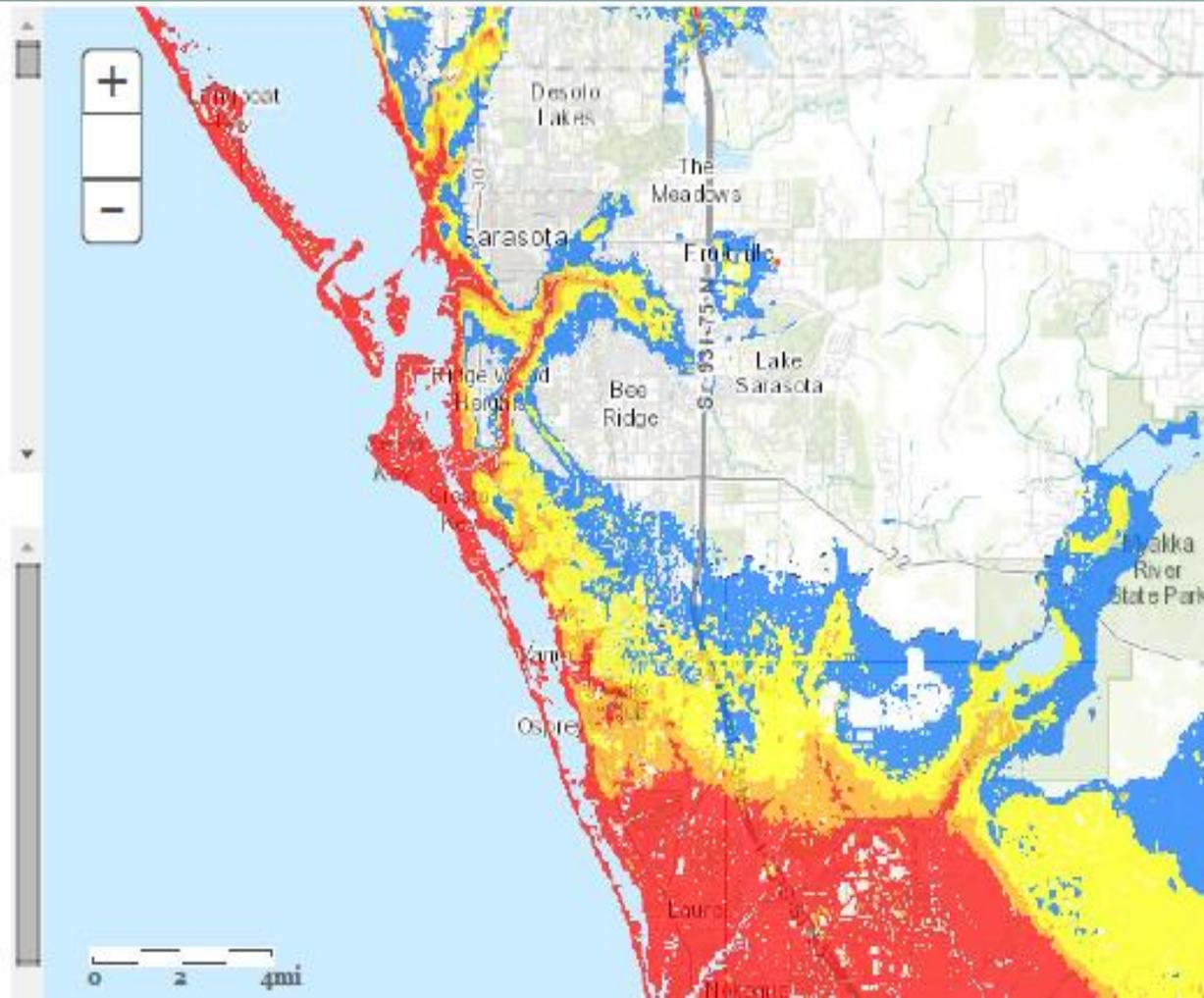
LEGEND

Category 5 (SLOSH MOMs) Storm Surge Inundation

Inundation Depth

- Up to 3 feet above ground
- Greater than 3 feet above ground
- Greater than 6 feet above ground
- Greater than 9 feet above ground

Levee Areas - Consult Local Officials For Flood Risk



See Interactive Viewer at

<http://noaa.maps.arcgis.com/apps/StorytellingTextLegend/index.html?appid=b1a20ab5eec149058bafbc059635a82ee>

Why is Surge an Important Issue?



- From 1990-2008, **population** density increased by **32% in Gulf coastal counties**, 17% in Atlantic coastal counties, and 16% in Hawaii (U.S. Census Bureau 2010)
- Over half of the Nation's **economic productivity** is located within coastal zones
- 72% of ports, 27% of major roads, and 9% of rail lines within the Gulf Coast region are at or below 4 ft elevation (CCSP, SAP 4-7)
- Storm surge of 23 ft: 67% of **interstates**, 57% of arterials, almost half of rail miles, 29 **airports**, and virtually all **ports** in the Gulf Coast area subject to inundation (CCSP SAP 4-7)

Vulnerability



- Coastal areas are at increasing risk from sea-level rise and storm surge
 - Sea-level rise and storm surge place many U.S. coastal areas at increasing risk of erosion and flooding. Energy and transportation infrastructure and other property in coastal areas are very likely to be adversely affected (Global Climate Change Impacts in the U.S. 2009)
- Rising sea-level provides a higher “base” for future surge/inundation events thus producing an increasing threat to:
 - Coastal communities
 - Ecosystems (wetlands, critical species, habitat loss, etc)
 - Transportation systems (highway systems, ports, rail)
 - Economic viability (tourism, transport of goods, natural resources)
 - Energy

Sea Level Rise Impacts in FL



Miami Beach, FL, today during 'King Tides'

Sea Level Rise Costs in FL

➤ Miami Beach, FL

- 80 new pumps at a cost of \$300 million, will overhaul the city's antiquated storm drainage system and buy time for 2-3 decades at the most
- After then, according to the Union of Concerned Scientists, city could face 237 floods a year.

➤ Miami-Dade County, FL

- \$50 billion estimated for a comprehensive capital plan that would include all kinds of things—desalination plants, the lifting of roads, the raising of land, creating canals, etc

Climate Change FL Costs Study

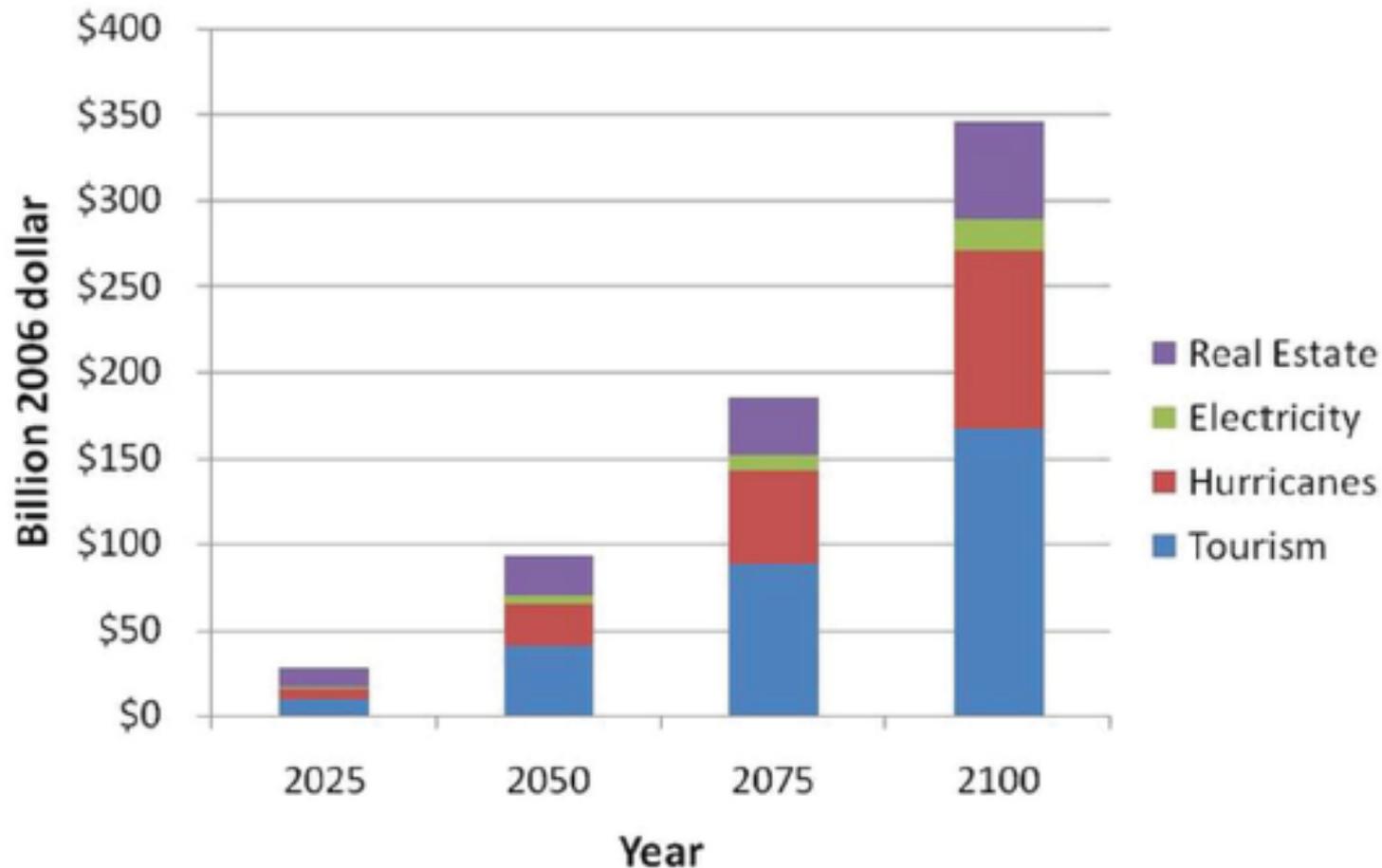


Figure 3. Annual costs associated with four major impacts of climate change on Florida's economy: The difference between rapid stabilization and business-as-usual scenarios.

Climate Change FL Costs Study

- ❖ The Federal Emergency Management Agency estimates that a 1-foot (12 inches) sea level rise would increase flood insurance premiums by 35–60% with coastal housing at the higher end.
- ❖ For the water system, a hotter and drier climate will increase demand for water while decreasing supply & increased salt water intrusion. Since desalination is expensive and requires large amounts energy, water supply costs will increase.

Sea Level Rise Adaptation Best Practices for Coastal Communities

- The Climate Community of Practice brings together extension, outreach and education professionals and community officials in the Gulf to learn how coastal communities can adapt to sea-level rise, precipitation changes and other climate-related issues.



<http://masgc.org/climate-outreach-community-of-practice>

Sea Level Rise Adaptation Best Practices for Coastal Communities



Resilient Communities: Fortified Building

See the video at <http://masgc.org/gallery/article/resilient-communities-fortified-building>

Sea Level Rise Adaptation Best Practices for Coastal Communities

NOAA Coastal Resilience Program's online tools:

- visualize future flood risks from sea level rise and storm surge
- identify areas and populations at risk from coastal hazards



➤ See the video at

<https://www.youtube.com/watch?v=5OrIrgid7V0>

<https://coast.noaa.gov/digitalcoast/tools/coastalresilience>



Sea Level Rise Planning for FL Coastal Communities



- ❖ The Florida Sea Grant Coastal Planning Program supports Florida Sea Grant's mission of using academic research, education and extension to foster a sustainable coastal economy and environment.

Sea Level Rise Planning for FL Coastal Communities



Rating	Discount
1	45%
2	40%
3	35%
4	30%
5	25%
6	20%
7	15%
8	10%
9	5%

- ❖ Coordinates the Community Rating System (CRS) of the National Flood Insurance Program (NFIP) to decrease the cost of NFIP premiums for their citizens.
- ❖ Implementation of strategies that reduce flood losses, such as preserving floodplains in their natural state or effectively maintaining stormwater systems.

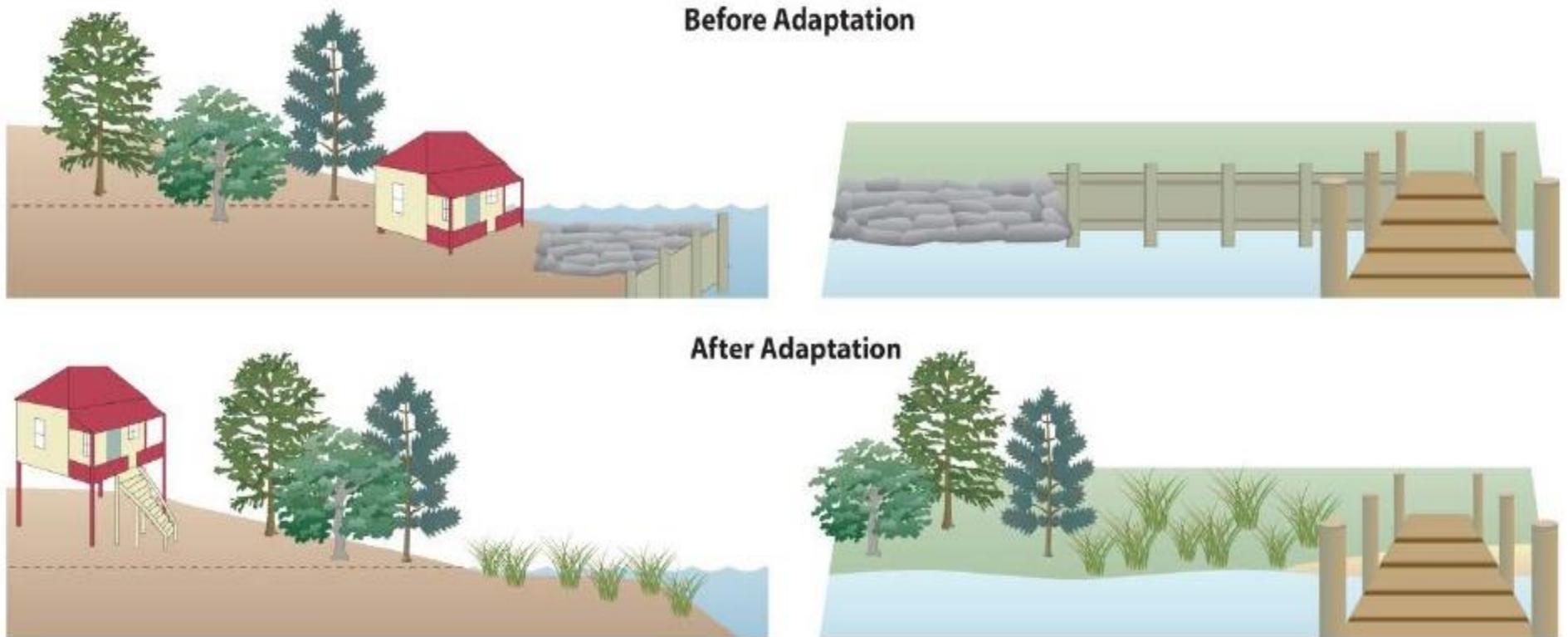
Sea Level Rise Planning for FL Coastal Communities



- ❖ **Communities can receive credits for:**
 - Showing climate change, sea-level rise, or other hazards not shown on Flood Insurance Rate Maps
 - **Disclosing to prospective purchasers the potential for flooding due to climate change or sea-level rise**
 - Basing a regulatory map on future hydrological conditions, including sea-level rise
 - **Including modeled changes to precipitation patterns due to climate change in watershed/drainage master plans**
 - Conducting flood-hazard assessment that incorporates climate change or sea-level rise

<https://www.flseagrant.org/climatechange/coastalplanning/flood-insurance/>

Sea Level Rise Adaptation Best Practices for FL Coastal Communities



Sea Level Rise Planning for FL Coastal Communities

❖ 1000 Friends of Florida is working to advise communities on the planning process required to coordinate resilient community responses

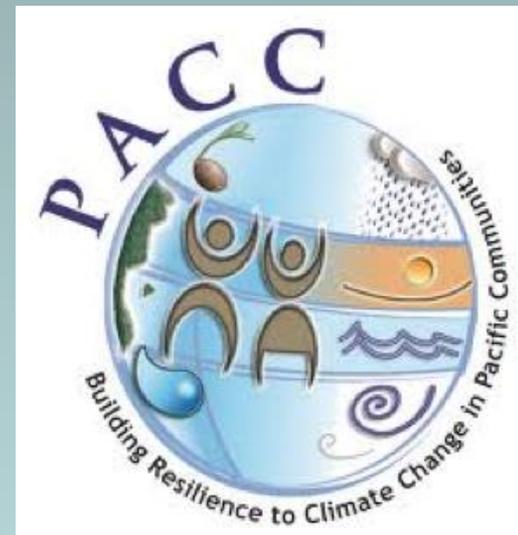


- promote more sustainable community development practices which can reduce Florida's contribution to increased greenhouse gas emissions.
- advise on long battles over changing zoning and building codes to prohibit building in areas that can't be protected.
- address disputes over private property rights

Sea Level Rise Resilience International Response Example

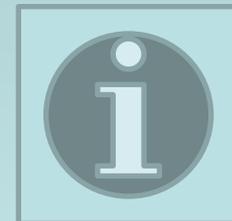
❖ Pacific Adaptation to Climate Change (PACC) project:

- first major climate change adaptation initiative in the Pacific region
- demonstrating best-practice adaptation in three key areas: coastal zone management, food security and food production, and water resources management



See the Youtube video at

<https://www.youtube.com/watch?v=dq234w56n2o>



<https://www.sprep.org/pacc>

Sea Level Rise Technological Response Proposals

- ❖ Rising water projects of ‘floating villages & cities’ as a reimagined real estate development in the coming decades, including: floating communities with floating parks & floating schools & hospitals.

Watch video ‘Top 10 Trends in Floating Cities’ – see <https://www.youtube.com/watch?v=0IkfWjHHEHM>



Climate Change Mitigation Technological Responses



Watch video “Newest Technology to Save Planet Earth and Stop Climate Change”
– see <https://www.youtube.com/watch?v=B7Dqzova80o>

Climate Change Mitigation Social Responses



Watch video “Champions of the Earth 2014’ – see
<https://www.youtube.com/watch?v=F2zfx1VP5k>



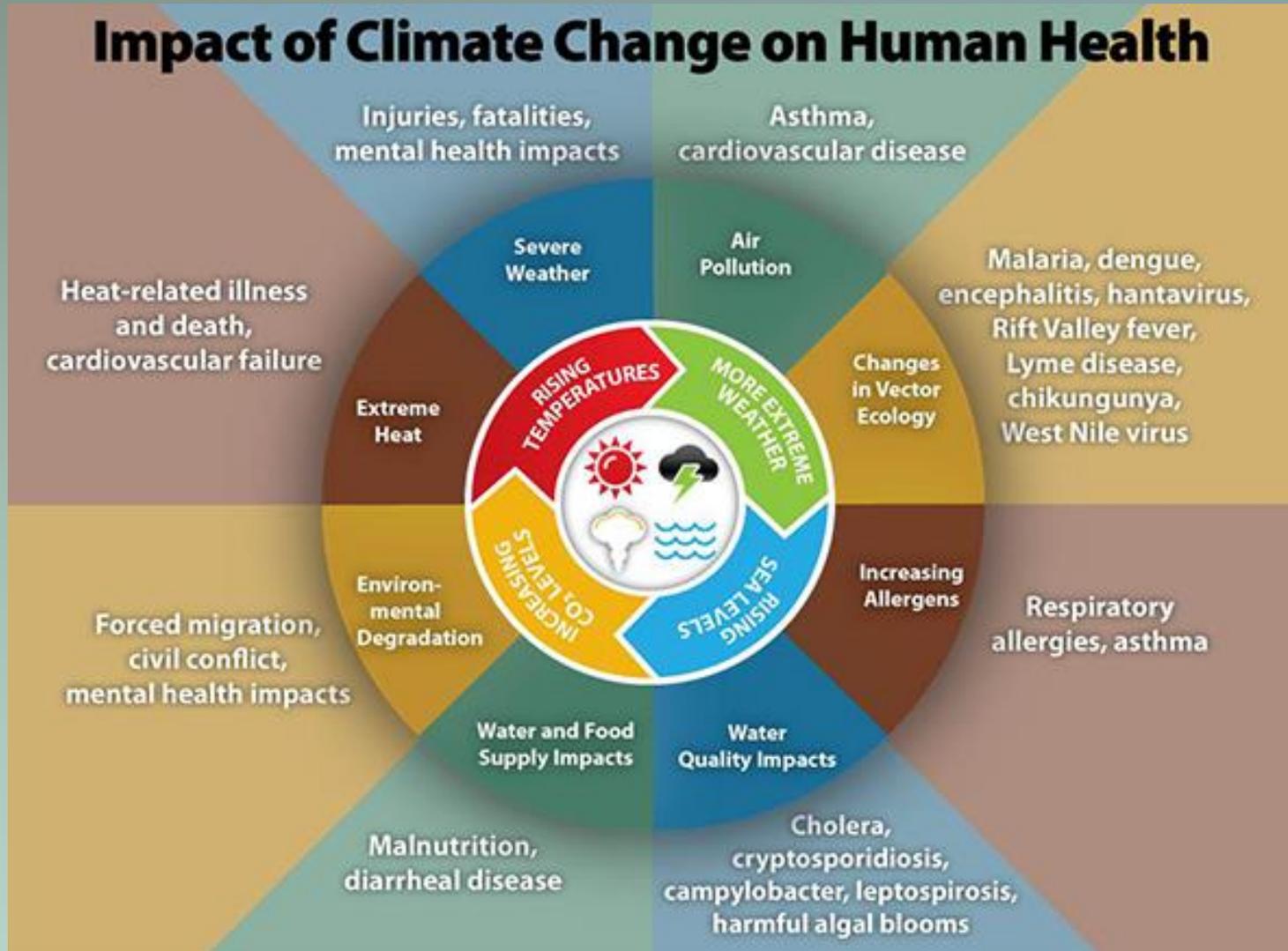
How Does Climate Change Affect Public Health?

Public Health Impacts of Climate Change



See the Youtube video at
<https://www.youtube.com/watch?v=Kb2HEZKXSYY>

Public Health Impacts of Climate Change



<http://www.cdc.gov/climateandhealth/effects/>

Some Of The Largest Disease Burdens Are Climate-Sensitive

❖ Each year:

- Undernutrition kills 3.5 million.
- Diarrhea kills 2.2 million.
- Malaria kills 900,000.
- Extreme weather events kill 60,000

❖ WHO estimates that the climate change that has occurred since the 1970s already kills over 140,00 per year.



Health impacts are unfairly distributed



Cumulative emissions of greenhouse gases, to 2002



WHO estimates of *per capita* mortality from climate change, 2000

Map projections from Patz et al, 2007; WHO, 2009.

International Community Has Given Clear Direction

- UNFCCC, Article 1, paragraph (1) states need to minimize adverse effects on "*natural and managed ecosystems or on the operation of socio-economic systems or on **human health and welfare***".
- World Health Assembly Resolution WHA/61.R19, and Executive Board Resolution EB124.R5, request WHO to ***develop capacity to assess the risks from climate change for human health and to implement effective response measures***, and support countries through ***Awareness raising, Partnerships, Evidence, and health system strengthening***.



Health System Strengthening: Definition Of An Essential Public Health Package

Most health risks in next 20-30 years could be averted through:

- comprehensive assessments of climate risks to health and health systems;
- integrated environment and health surveillance;
- delivery of preventive & curative interventions climate-sensitive public health concerns;
- preparedness and response to the public health consequences of extreme weather events;
- applied research; and
- strengthening of human and institutional capacities and inter-sectoral coordination.



Climate Change Public Health Impacts in FL

- ❖ With climate change, residents can expect to see more public health risks from storms, flooding and waterborne illnesses, infectious diseases like dengue fever, drought, extreme heat waves, and declining air quality.
- ❖ View these impacts at <http://www.nrdc.org/health/climate/fl.asp>



Climate Change

Public Health Responses in FL

- ❖ The Building Resilience Against Climate Effects (BRACE) Program at the Florida Department of Health (DOH) is working to improve the ability of the public health sector to respond to health effects related to climate variability.
 - analyzing the current and projected future impacts of climate on health
 - developing a FL climate & health adaptation plan
 - help communities plan for these events
 - increase public awareness of climate-sensitive health outcomes and to promote healthy actions to reduce risk.

<http://www.floridahealth.gov/%5C/environmental-health/climate-and-health/brace/index.html>

The Science of Climate Change...



<https://www.youtube.com/watch?v=KJhbQllu4mk>

What Can I Do?

➤ *Support and/or participate in the Resilience AmeriCorp program:*

- recruit, train, and embed AmeriCorps VISTA members in ten communities across the country to increase civic engagement and community resilience in low-income areas
- help those communities develop plans for becoming more resilient to any number of shocks and stresses, including better preparations for extreme weather events



<http://www.nationalservice.gov/programs/ameri-corps/resilience-ameri-corps>

What Can I Do in Sarasota County?

- *Let your voice be heard on climate change planning and action via the Comprehensive Plan Update Process – see <https://www.scgov.net/compplanupdate/Pages/default.aspx>*
- *Learn about local action steps to take from the Office of Sustainability of Sarasota County – see <http://sarasota.ifas.ufl.edu/Sustain/climate.shtml>*

What Can I Do in General?

- 1) *Green your commute*
- 2) *Be energy efficient*
- 3) *Choose renewable power*
- 4) *Eat wisely*
- 5) *Trim your waste*
- 6) *Let polluters pay*
- 7) *Fly less*
- 8) *Get informed*
- 9) *Get involved*
- 10) *Support and donate*

Acknowledgements

Jennifer Francis, Ph.D.
Rutgers University, Institute of Coastal &
Marine Science
'Our Wacky Weather and Disappearing
Arctic Sea Ice: Are They Connected?'

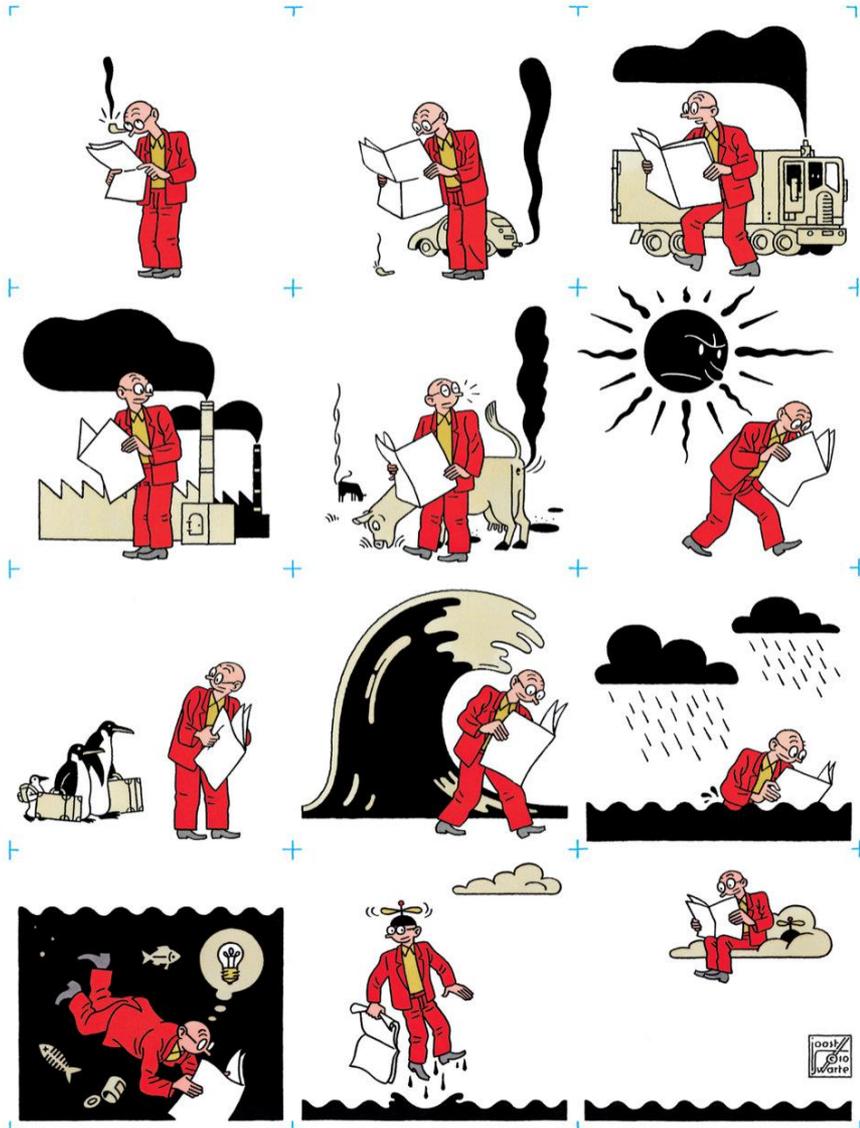
FL Center for Environmental Studies
FL Atlantic University
'Weather and Climate'

www.ces.fau.edu/nasa/content/teacher-materials/wc-ppt.pptx

PRICE \$5.99

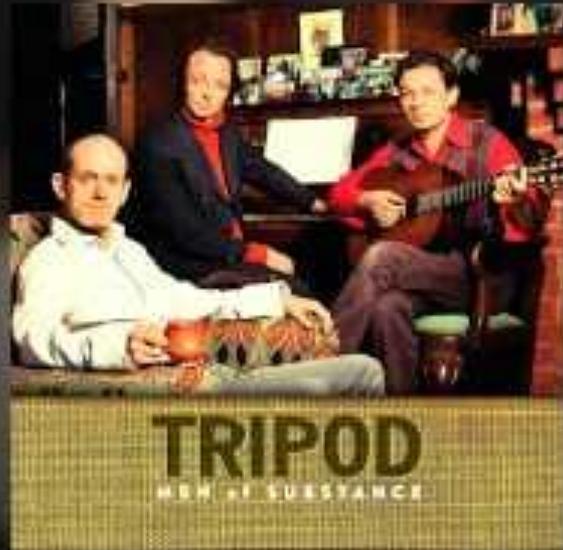
MAY 17, 2010

THE NEW YORKER



THANK-YOU !!

WACKY WEATHER?



Climate Change

Tripod

Men of Substance



See the video at <https://www.youtube.com/watch?v=xetsxpKjmQo>.

Online Resources

- National Geographic, If All The Ice Melted: An Interactive Map, see <http://ngm.nationalgeographic.com/2013/09/rising-seas/if-ice-melted-map>
- NRDC Introduction to Climate Change – see http://www.nrdc.org/globalwarming/climatebasics.asp?gclid=Cj0KEQIAycCyBRDss-D2yIWd_tgBEiQAL-9RksRU8V-u1p6qkWqb7YJxLe_OT3TqffrniTwP1XITda8aArla8P8HAQ
- UF/IFAS Extension, EDIS: Climate Change, see http://edis.ifas.ufl.edu/topic_climate_change
- UF/IFAS Extension Sarasota County, Climate Change, see <http://sarasota.ifas.ufl.edu/Sustain/climate.shtml>
- USDA. Social Vulnerability and Climate Change – see http://www.fs.fed.us/pnw/pubs/pnw_gtr838.pdf
- World Health Organization. Climate Change and Human Health – see <http://www.who.int/globalchange/en/>
- World Resources Institute. Climate – see <http://www.wri.org/our-work/topics/climate>

Online Video Resources

- A Wild Solution for Climate Change – see <https://www.youtube.com/watch?v=pgyRZsRHlyQ>
- National Geographic. Six Degrees Could Change the World – see https://www.youtube.com/watch?v=R_pb1G2wloA
- NOAA Coastal Resiliency WEB – see <https://www.youtube.com/watch?v=DzLCwTARBNs>
- Sea Grant Resilient Coastal Community Demonstration Tours Videos:
<https://www.youtube.com/watch?v=WUtqtAChU1U>
<https://www.youtube.com/watch?v=MQcWFNrEdGo>
<https://www.youtube.com/watch?v=Abr7V70oY-k>
- Waterways Episode 268 - Climate Change and Sea Level Rise in South Florida – see <https://www.youtube.com/watch?v=rSNNoh5XgWM>