

USCRTF Climate Change Working Group

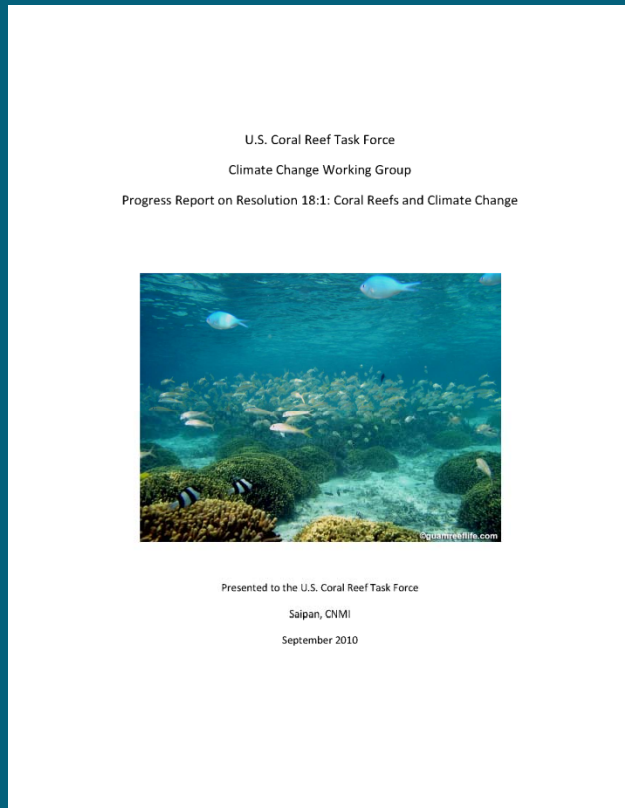
Progress on Resolution 18.1
Report Out on the Climate Adaptation Workshop
Bleaching Outlook 2010



Dr. C. Mark Eakin
Britt Parker
NOAA Coral Reef Watch

Dr. Jordan West
US EPA Office of Research and Development

Background



- 18th Meeting of the USCRTF – American Samoa
- Resolution 18.1: Coral Reefs and Climate Change
- Establish the Climate Change Working Group (CCWG) as a standing body of the USCRTF
- Section 8e charges CCWG to report back to Task Force

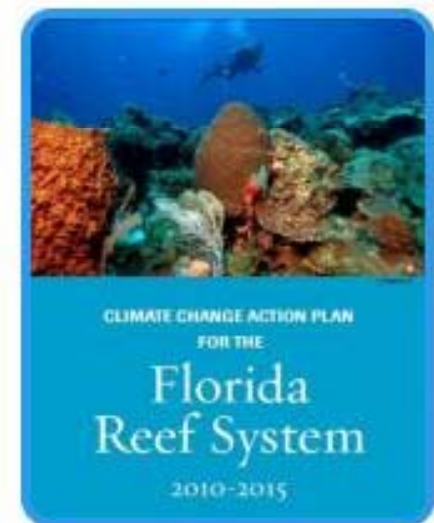
Agencies & Jurisdictions

Agency/State/Territory	Name
NOAA	Mark Eakin (co-chair)
EPA	Jordan West (co-chair)
NASA	Liane Guild
DOI/FWS	Dan Polhemus
Florida	Chantal Collier
Puerto Rico	Aileen Velazco
Hawai'i	Robert Nishimoto
American Samoa	Lelei Peau
US Virgin Islands	Paige Rothenberger
Guam	Evangeline Lujan
CNMI	Fran Castro

* Thank you to the AIC for coordinating Jurisdictional Response

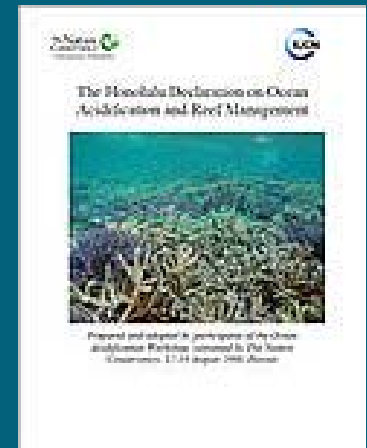
8a: Toolbox of Mgmt Actions

- USFWS supports climate change and mgmt through **Pacific Islands Climate Change Cooperative**
- EPA and other agencies contributed to **USCCSP Synthesis and Assessment Product 4:4** including mgmt strategies for MPAs in context of Climate Change
- FL developed the **Climate Change Action Plan for the Florida Reef System**



8b: OA Impacts and Response

- CCWG developed a *Response to the Honolulu Declaration on Ocean Acidification*
- NOAA released the *NOAA Ocean and Great Lakes Acidification Research Implementation Plan*
- EPA investigating **how to address OA** under the Clean Water Act Section 303(d)
- NOAA and partners **monitoring Caribbean carbonate chemistry from satellites**, NASA supporting further development



8c: Education & Outreach

- NOAA developing **CC and OA resources for teachers**
- AS is working with Dept. of Education to incorporate **climate change into curriculum** for several grade levels
- PR has developed **PSAs to educate public on climate change impacts**

8d: Expand Partnerships

- EPA co-chairs Ecosystems Interagency Working Group of **U.S. Global Change Research Program (USGCRP)**, other agencies involved
- **Florida Reef Resilience Program** is a model of partnerships that is being replicated in other jurisdictions

9: Fed Support for Jurisdictional Strategies

- *The NOAA CRCP Goals and Objectives 2010-2015* includes working with managers to address climate impacts
- EPA is soon to release a manual, *Coral Reef Biological Criteria: Using the Clean Water Act to Protect a National Treasure*

10: Jurisdictional Climate LAS

- NOAA, EPA and USFWS is working to support **LAS projects**
- AS and HI have **climate LAS** and the other jurisdictions are updating current LAS or developing new climate LAS

11: Reduction of GHG Emission

- AS, HI, PR and FL have all passed **Executive Orders or Legislation to reduce GHG emissions** and it is part of the AS Climate LAS.

12: Bleaching Response Plans

- NOAA and partners supported the development of Bleaching Response Plans through **Reef Resilience and Climate Change Workshops**
- **Many jurisdictions have or are developing bleaching response plans**, some address other stresses like disease and Crown of Thorns (HI)

13: “Green” USCRTF Meetings

- There has been an effort to reduce the carbon footprint of the USCRTF Meetings
- HI Meeting – Published “Green Meeting” brochure, worked with hotel to **reduce waste, carbon offset purchase available**
- CNMI Meeting – Published “Green Meeting” brochure, worked with hotel to **reduce waste, carbon offset purchase available**, restaurant list with options for eating local

Summary

- Good action by the agencies and jurisdictions
- So far, most work conducted in parallel
- Some work conducted cooperatively by members (examples including 2005 bleaching)

USCRTF Climate Change Working Group

Progress on Resolution 18.1

Questions?

Climate Adaptation Workshop Report Out

- 7 presentations
 - Advancing Management Adaptation to Climate Change
 - SPREP Regional Adaptation to Climate Change
 - Climate Change Adaptation Planning Efforts in the FSM
 - Climate Change Adaptation in the RMI
 - Rapid Assessment of Resilience in Palau
 - Climate Camp Micronesia 2010
 - Cooling Coral Reefs in American Samoa
- Panel Discussion



Advancing Management Adaptation to Climate Change



Mark Eakin, National Oceanic and Atmospheric Administration*
Jordan West, US Environmental Protection Agency*
Britt Parker, National Oceanic and Atmospheric Administration



EPA Office of Research and Development
National Center for Environmental Assessment , Global Change Research Program

NOAA Coral Reef Watch
NOAA Coral Reef Conservation Program

*The views expressed are those of the authors and do not necessarily represent the official policy of the US EPA or NOAA



Framework for Adaptation Planning



- Review **management goals**
- Identify **key ecosystem components and processes**
- Assess **CC threats** to key components and processes
- Identify **adaptation approaches** & specific strategies
- Analyze **barriers and opportunities** for implementation

Adapted from the US Climate Change Science Program's SAP 4.4: *Preliminary Review of Adaptation Options for Climate-Sensitive Ecosystems and Resources*



Secretariat of the
Pacific Regional
Environment
Programme



Secretariat of the Pacific Regional Environment Programme (SPREP) and Regional Adaptation to Climate Change

Paul Anderson

SPREP marine conservation analyst

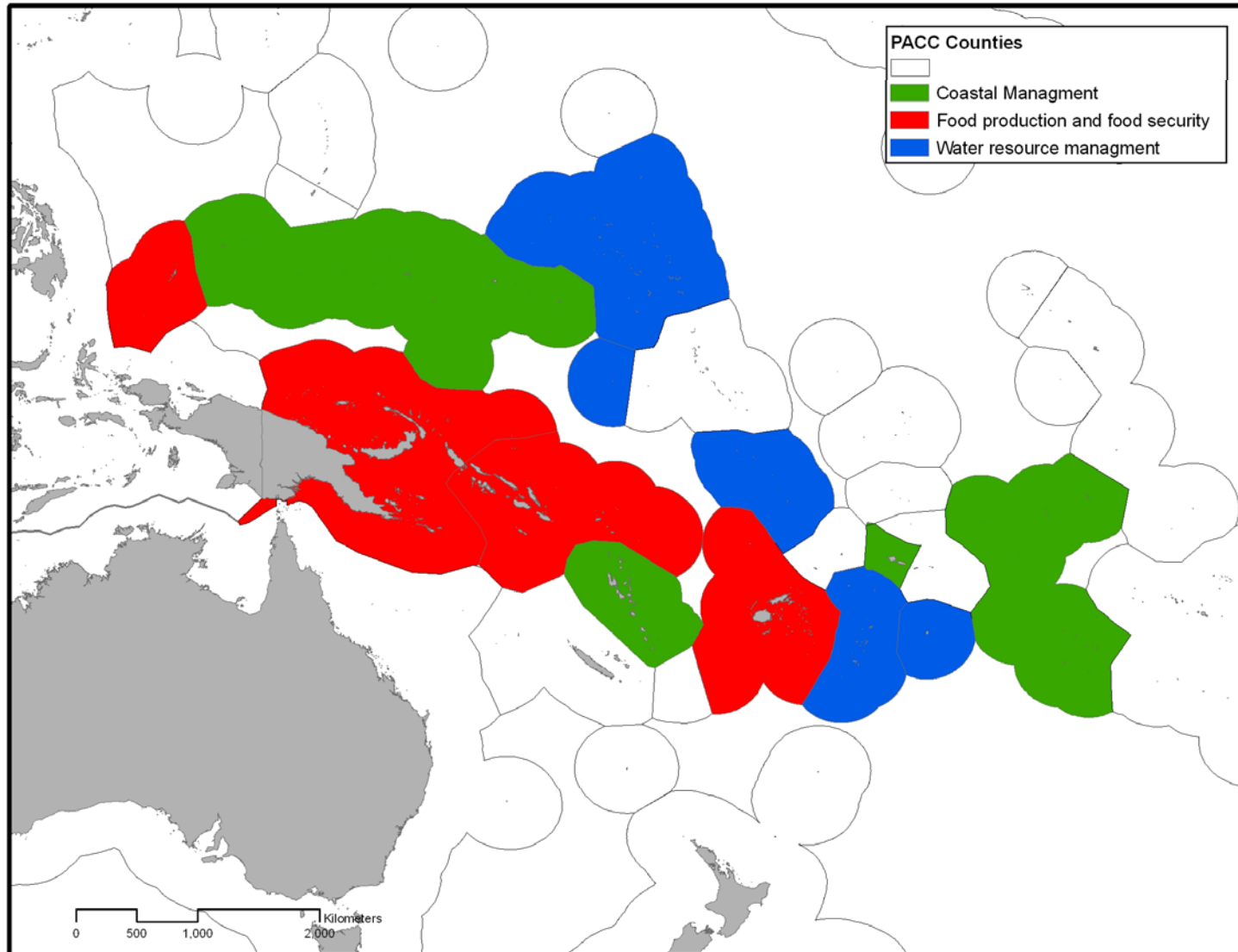




Secretariat of the
Pacific Regional
Environment
Programme



PACC- Pacific Adaptation to Climate Change





Secretariat of the
Pacific Regional
Environment
Programme



Climate Change Activities

- Meteorological Services
- Climate change policy
- Renewable energy
- National adaptation action plans
- Pacific Adaptation to Climate Change project
- Pacific Biodiversity and Climate Change Ecosystem-based Adaptation project
- Oceanscapes Framework



Federated States of Micronesia
Vulnerability and Adaptive Assessment –
Food Security Context
2010 USCRTF Meeting

FSM Case Study
Marion Henry, Secretary
FSM National Government
Department of Resources and Development

V&A Projected Impacts

- Increase in air and water temperatures
- Change in rainfall patterns
- Rising sea level
- Ocean acidification
- Increase in intensity and range of cyclones
- Increase in storm surge risks

Health



Extreme weather



Water



Food

Challenge: Adaptation and Relocation/Migration



Mitigate? Adapt?
Surrender?

Mainstreaming Climate Change in the Republic of the Marshall Islands



In partnership with

RMI Coastal Management Advisory Committee

Namdrik Community

US Agency for International Development & US State Department

Presented by Don Hess, College of the Marshall Islands



Community Based Process

Reimaanlok Looking to the Future

National Conservation Area Plan for the
Marshall Islands
May 2008

- A technical tool to assist facilitate resource management planning through a consultation process;
- Identifies & recommends targets important for cultural purposes and for unique and special areas
- Climate change adds new difficulty and is being incorporated as part of the Reimaanlok process

Namdrik Assessment – issues/threats

Issues/threats

- Increased solid waste
- Increased erosion
- Shifts in seasons
- Increased flooding
- Appearance of invasive
- ↓ marine resources
- Degradation of crops
- *Water lens*

WORKSHEET 8: PRIORITIZING THE THREATS

THREATS	TARGET	AREA	INTENSITY	URGENCY	TOTAL SCORE
1. Kwapej	7	3	1	3	14
2. Ene Jwakk	5	2	3	3	13
3. Eporan Jekot Ekan	1.5	1	2	3	7.5
4. Eiet Inhamin Mama Tejet	2	3	3	3	11
5. Invasive Sp.	5	1	3	3	12
6. Elen jibnko eg stauji	4	2	3	3	12
7. Otelet - Sam Ko	5	3	2	3	13

Partnership is Critical to Success!!



The Nature
Conservancy 
Protecting nature. Preserving life.™

Rapid Assessment Teams and Testing of Resilience Principles in the face of Current Bleaching in the El Niño La Niña Cycle

Trina Leberer



What resilience looks like for corals



high cover
high diversity
low disease
broad size range

strong recovery
good substrate
good water quality
good herbivores



Current Situation



- 2009-10 El Niño caused severe / extensive bleaching in parts of Coral Triangle
- Current La Niña causing serious bleaching in Palau
- Similar pattern to El Niño / La Niña of 1997-1999



Adapting to a Changing Climate Workshop: Climate Camp 2010

*Preparation for the development of a community based adaptation
guidebook for Micronesia*

Sept 6-10, 2010 Pohnpei, FSM

John Starmer

CNMI Coastal Resource Management



Supporting the Micronesia Challenge

- Participants from the FSM (Yap, Chuuk, Pohnpei, and Kosrae), The Republic of the Marshall Islands, Palau, Guam, and CMNI
- Gathered in Pohnpei to share their knowledge with resource experts from MCT, TNC, Secretariat of Pacific Communities, the University of Guam, USGS, and NOAA

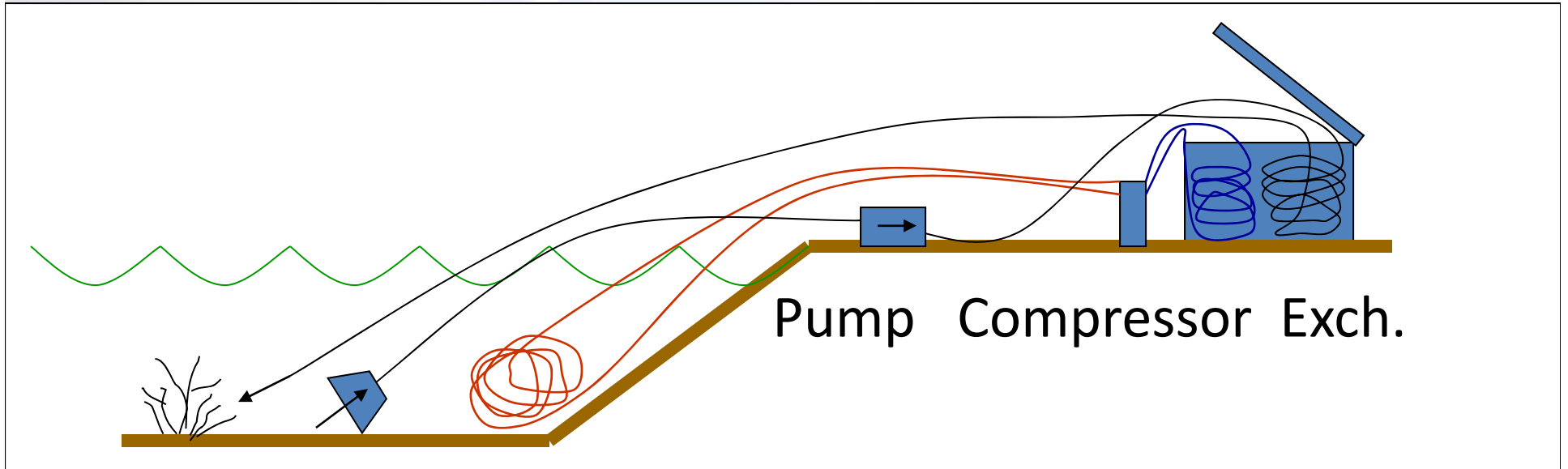
Workshop Primary Outcomes

- **Revision of PIMPAC Planning Manual to include Climate Change**
 - For Facilitators in Planning Process (local NGOs, Gov't, etc)
 - To help build community leaders to enable planning for climate change impacts
- **Flipchart & Fact Sheets for Community Outreach in Local Languages**
 - Tool for Traditional and Community Leaders & Champions to communicate climate change impacts and adaptation
 - Explain climate change, impacts, etc (regional level)
- **Companion Guide to Flipchart in Local Languages**
 - Local, placed-based information on climate change impacts and adaptation strategies

Reversing coral bleaching on Pacific reefs

Brian Von Herzen, Ph.D.
Kelley Anderson, M.Sc.
The Climate Foundation
Doug Fenner, Ph.D., DMWR

Test coral response to cooler water



Challenges and opportunities

- Logistics – shore power, solar, thermal power.
- Collaboration and assistance from American Samoan government

Future work

- Expand cooling experiments using solar-powered systems
- Prevent bleaching from starting using reef cooling

Key Points

- Many **island states are already seeing the impacts** of climate change and know it is happening
- **Need coordination, long term plans, and sustainably-funded projects** using local experts to build local capacity
 - **“Green” fees** and use fees can provide sustainable financing to implement adaptation strategies
- **Renewable energy** and infrastructure, including seawater air conditioning, have great potential for the islands
- USCRTF needs to **encourage climate policies** at all levels
- Climate Change Working Group to continue to identify ways agencies and jurisdictions can promote adaptation
- **Mitigation and adaptation require all of us**

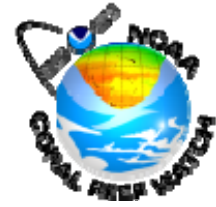
USCRTF Climate Change Working Group

Report Out on the Climate Adaptation Workshop

Questions?



NOAA Satellite and Information Service
National Environmental Satellite, Data, and Information Service (NESDIS)



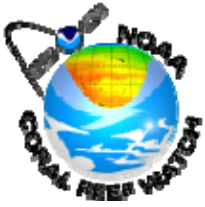
NOAA Coral Reef Watch Bleaching Outlook for 2010

Dr. C. Mark Eakin,
US Coral Reef Task Force
September 15, 2010



NOAA
CORAL REEF
CONSERVATION PROGRAM

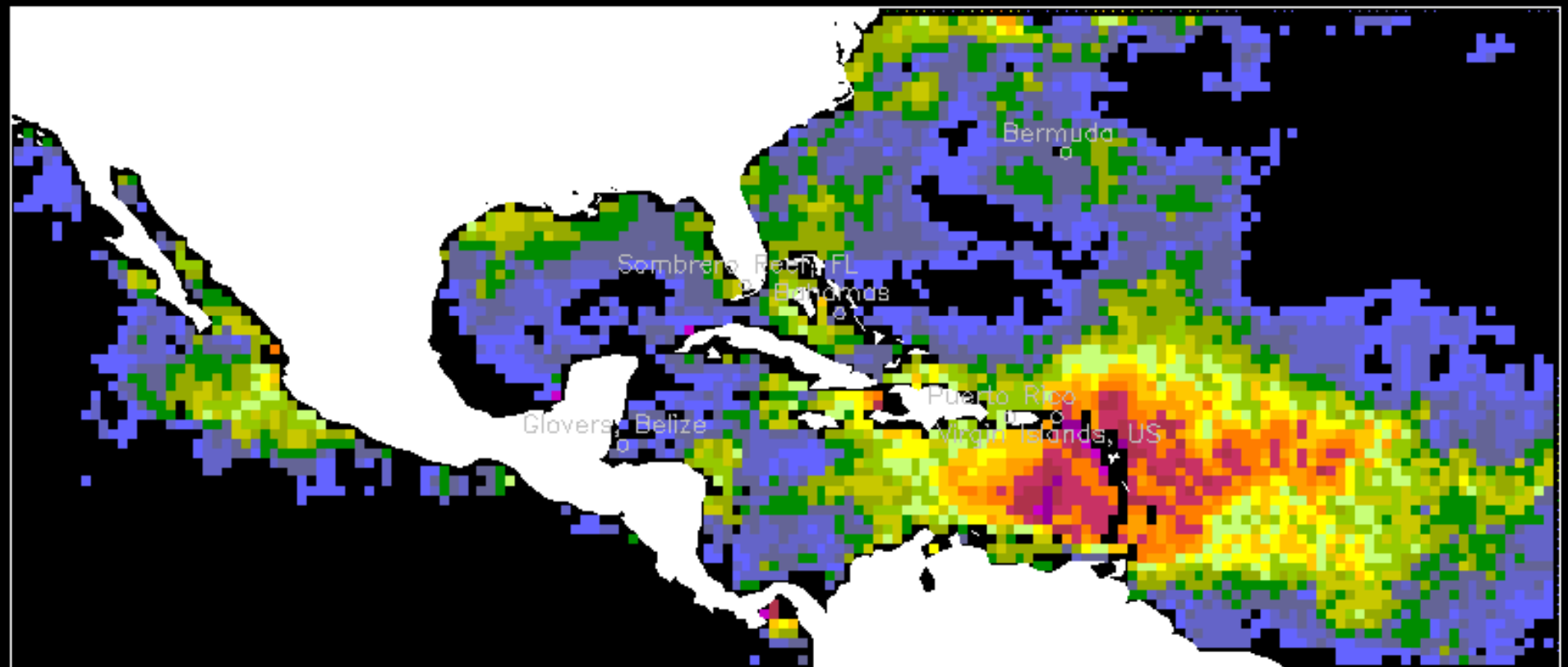
Coral Reef Watch website: <http://coralreefwatch.noaa.gov/>

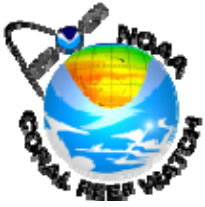


USCRTF November 2005, Palau



NOAA/NESDIS Degree Heating Weeks for last 12 Weeks – 11/1/2005





2005 Bleaching & Mortality in Caribbean

Bleaching & Mortality in USVI



6 sites

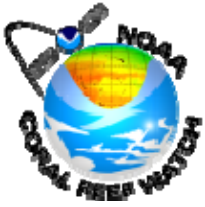
120 video
transects

> 90% bleached

> 60% dead

Miller, et al. (2009)

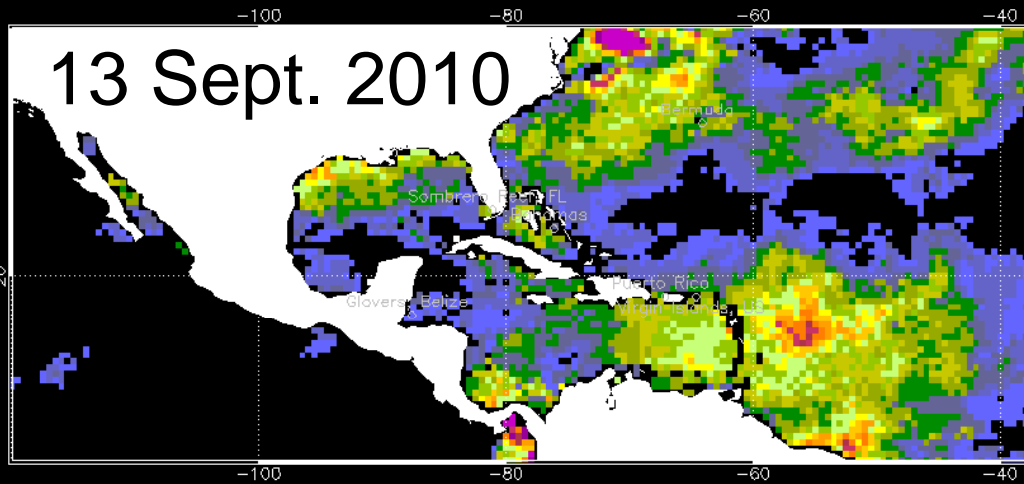




Current Bleaching Conditions

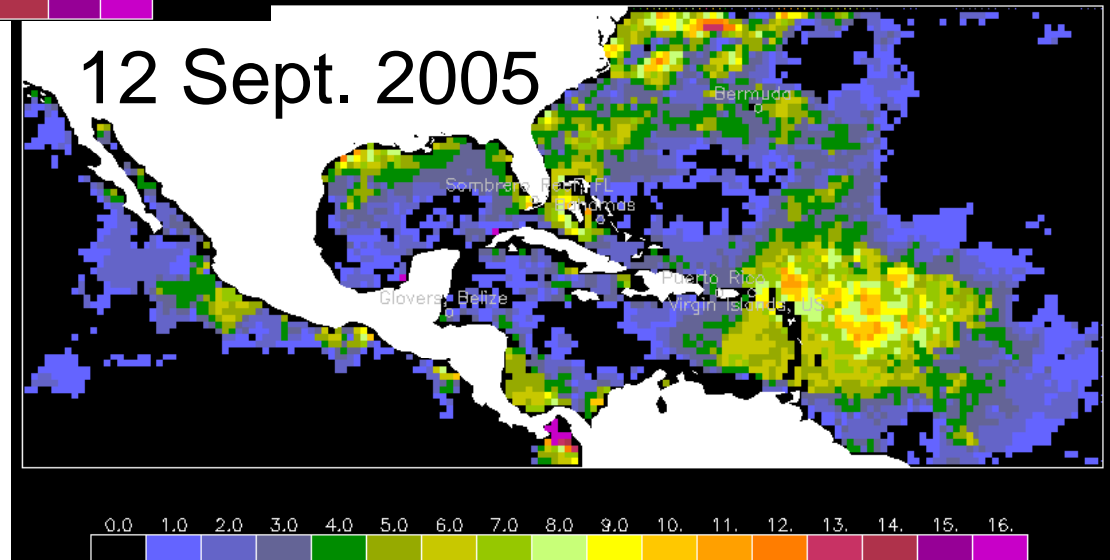


NOAA/NESDIS Degree Heating Weeks for last 12 Weeks - 9/13/2010



Comparison with 2005

NOAA/NESDIS Degree Heating Weeks for last 12 Weeks - 9/12/2005



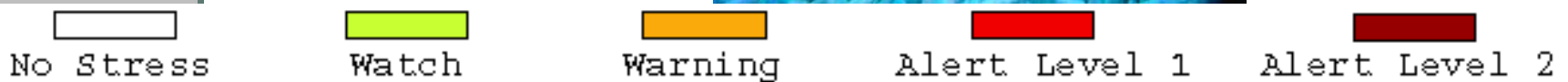
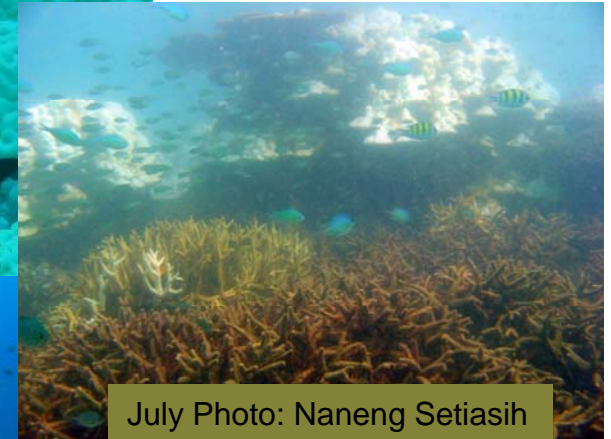
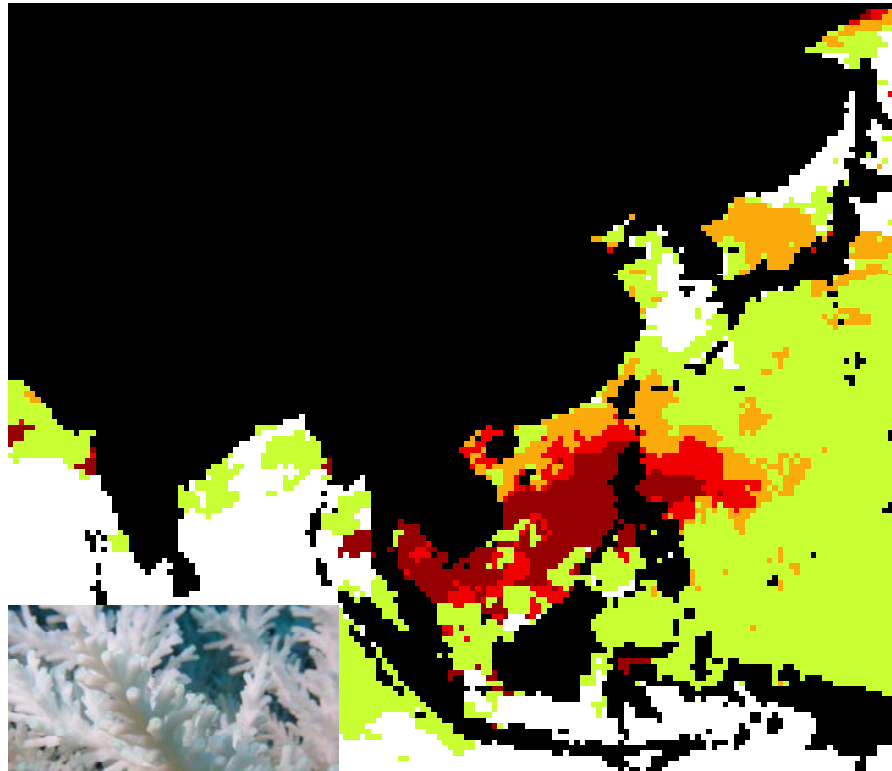
http://coralreefwatch.noaa.gov/satellite/current/products_dhw.html



2010 Southeast Asia



NOAA Coral Reef Watch Monthly Maximum Satellite Coral Bleaching Alert Area Jul 2010

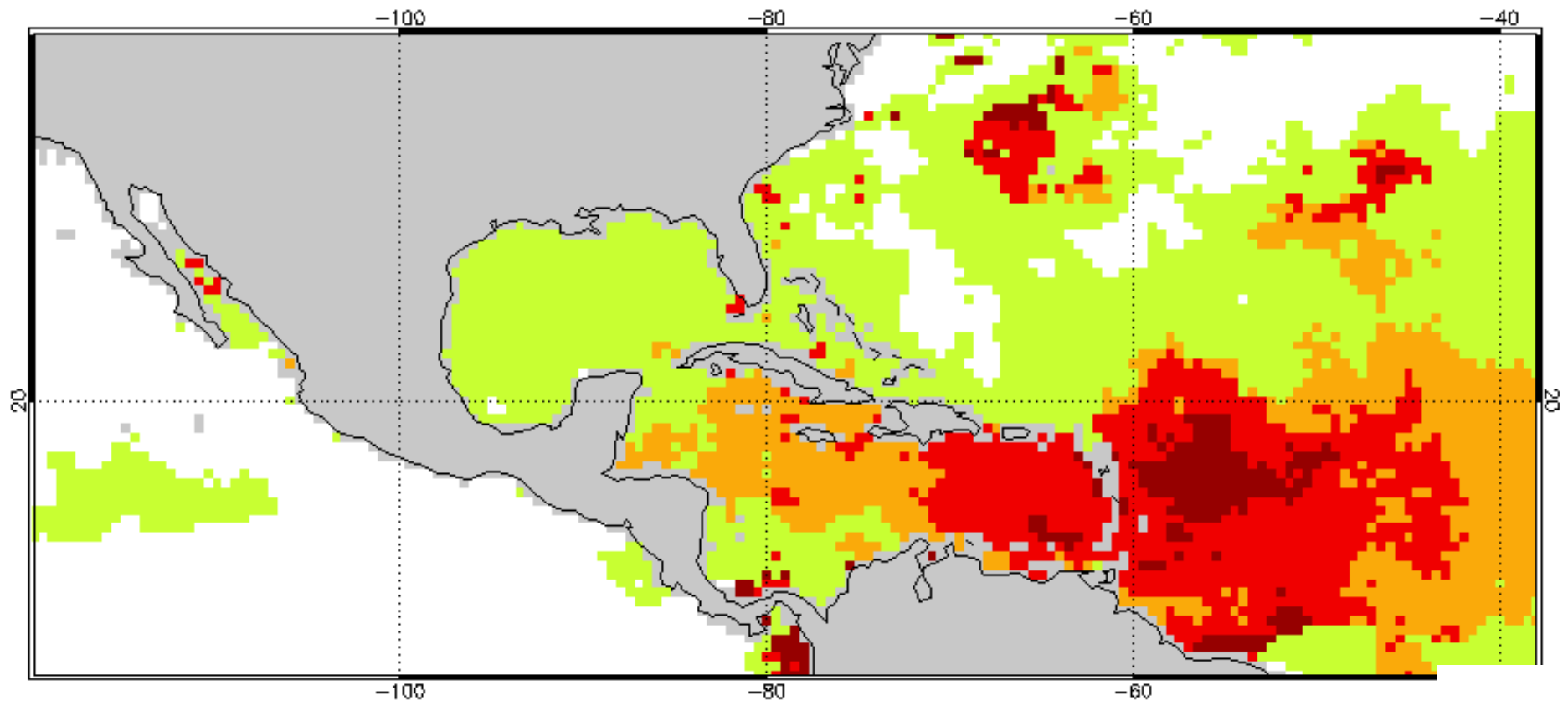




Current Bleaching Conditions – Operational Product



NOAA Coral Reef Watch Satellite Coral Bleaching Alert Area
13 Sep 2010



<http://coralreefwatch.noaa.gov/satellite/baa/index.html>

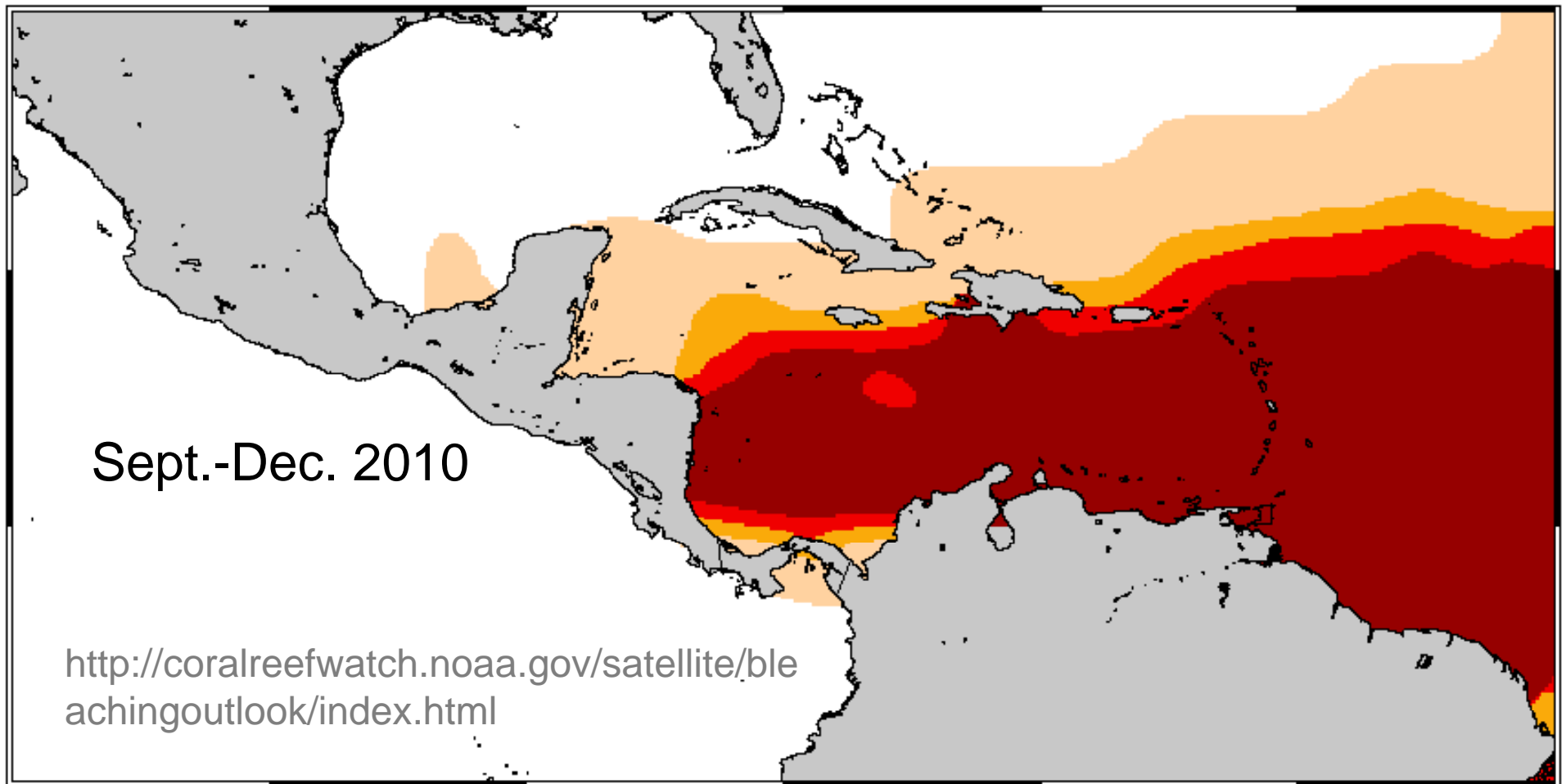








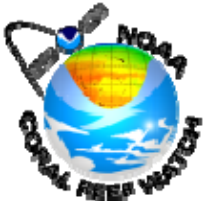
Seasonal Bleaching Outlook



2010 Sep 14 NOAA Coral Reef Watch Coral Bleaching Thermal Stress Outlook for Sep–Dec 2010
(Version 2, Experimental)



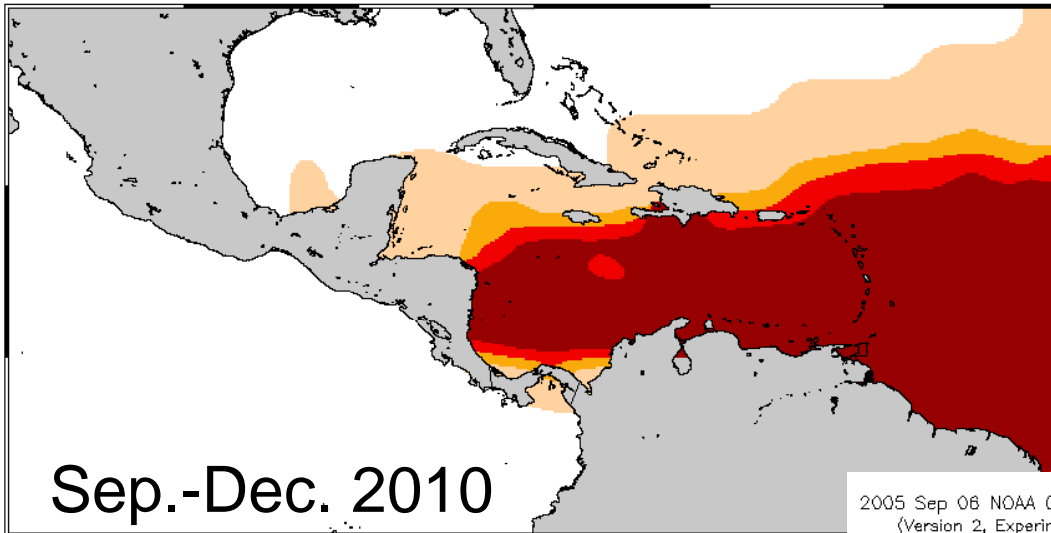
Potential Stress Level:  Watch  Warning  Alert Level 1  Alert Level 2



Seasonal Bleaching Outlook



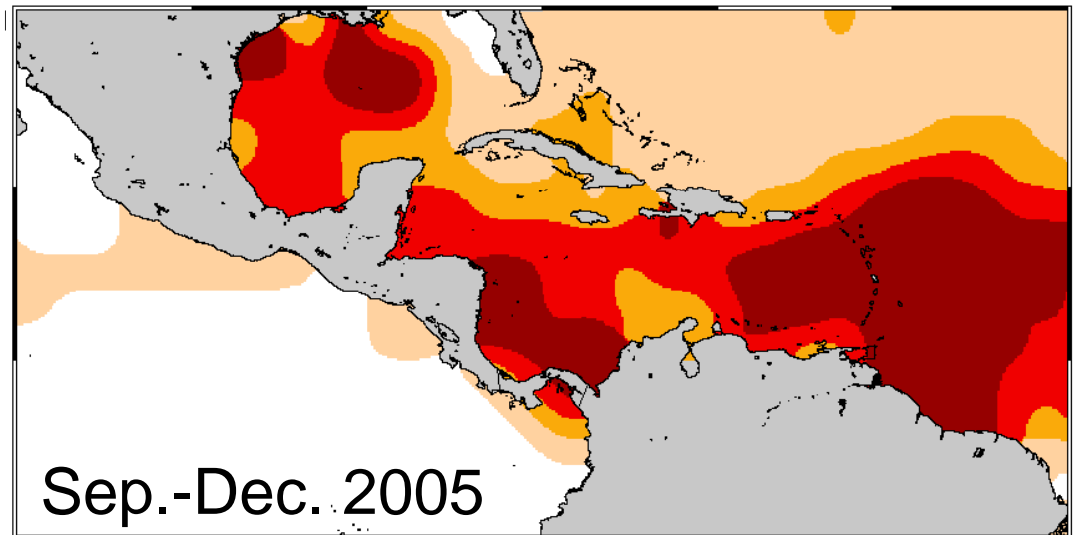
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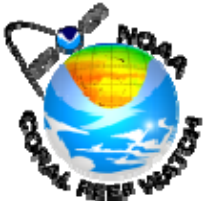
Comparison with 2005

2005 Sep 06 NOAA Coral Reef Watch Coral Bleaching Thermal Stress Outlook for Sep-Dec 2005
(Version 2, Experimental)

Potential Stress Level: Watch Warning Alert Level 1



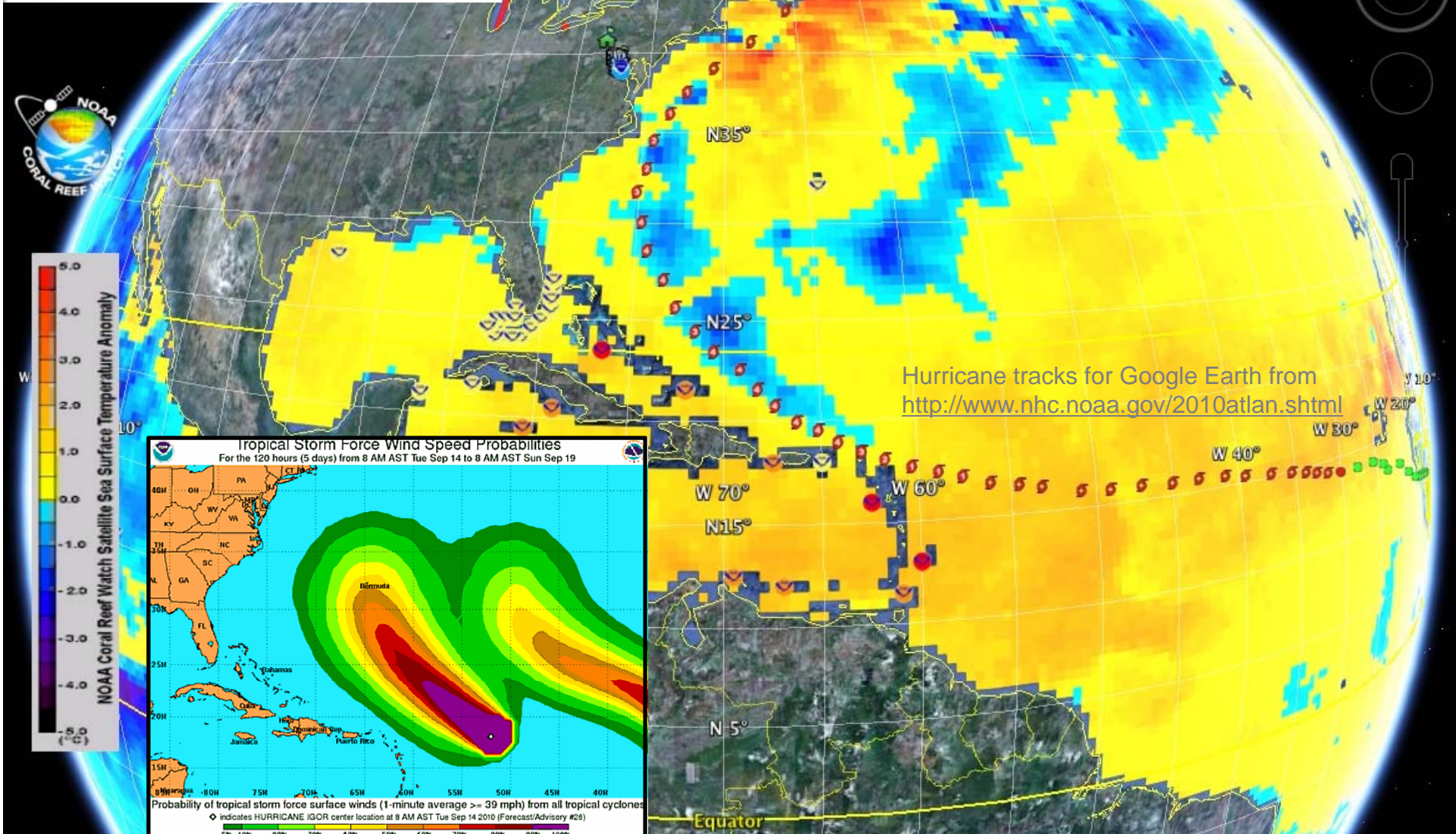
Potential Stress Level: Watch Warning Alert Level 1 Alert Level 2

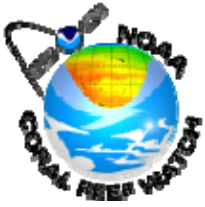


Current Bleaching Conditions

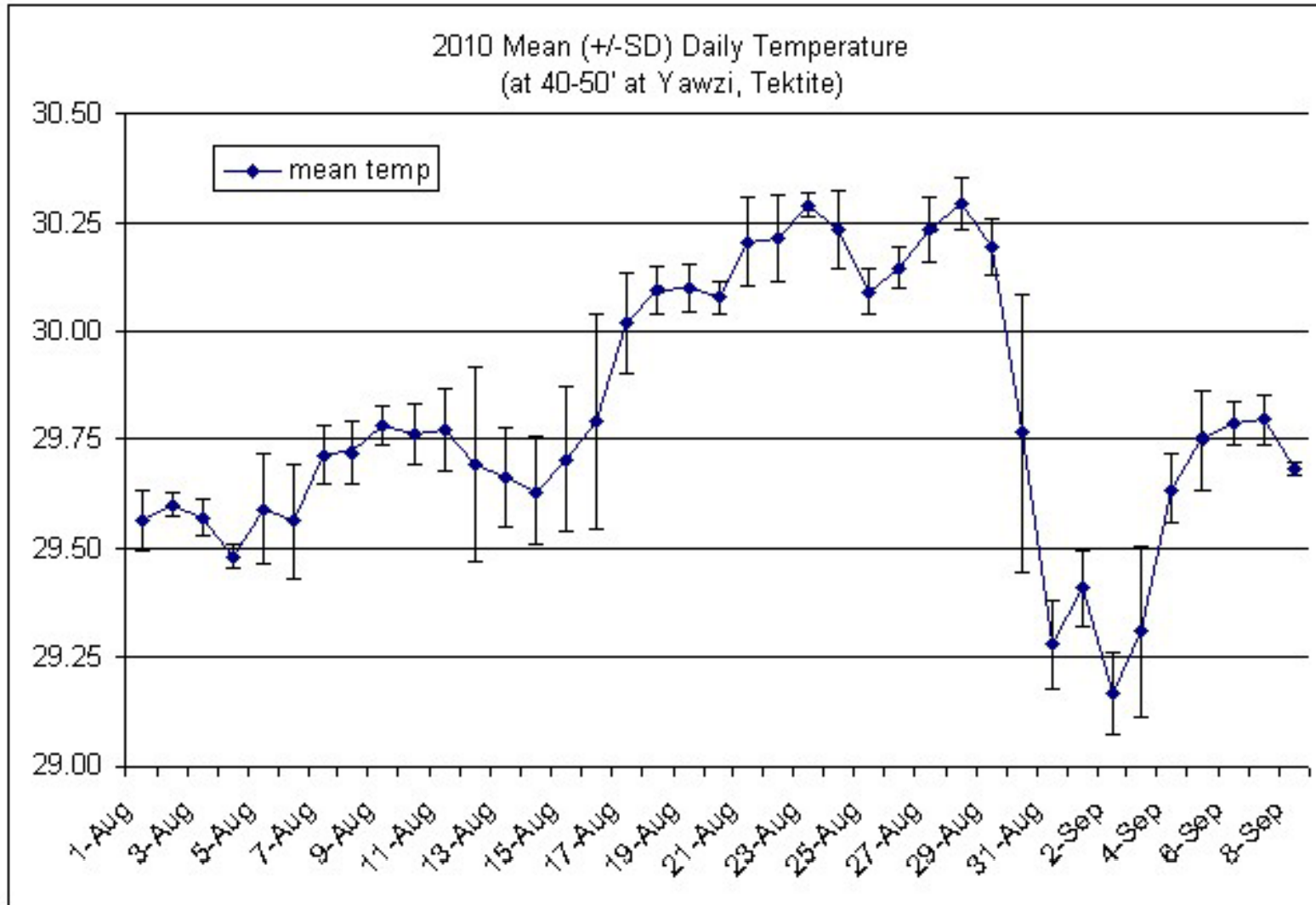


a1072010 EARL
National Hurricane Center (NWS/NOAA)





2010 US Virgin Islands National Park Data Loggers



From
Jeff Miller,
US NPS

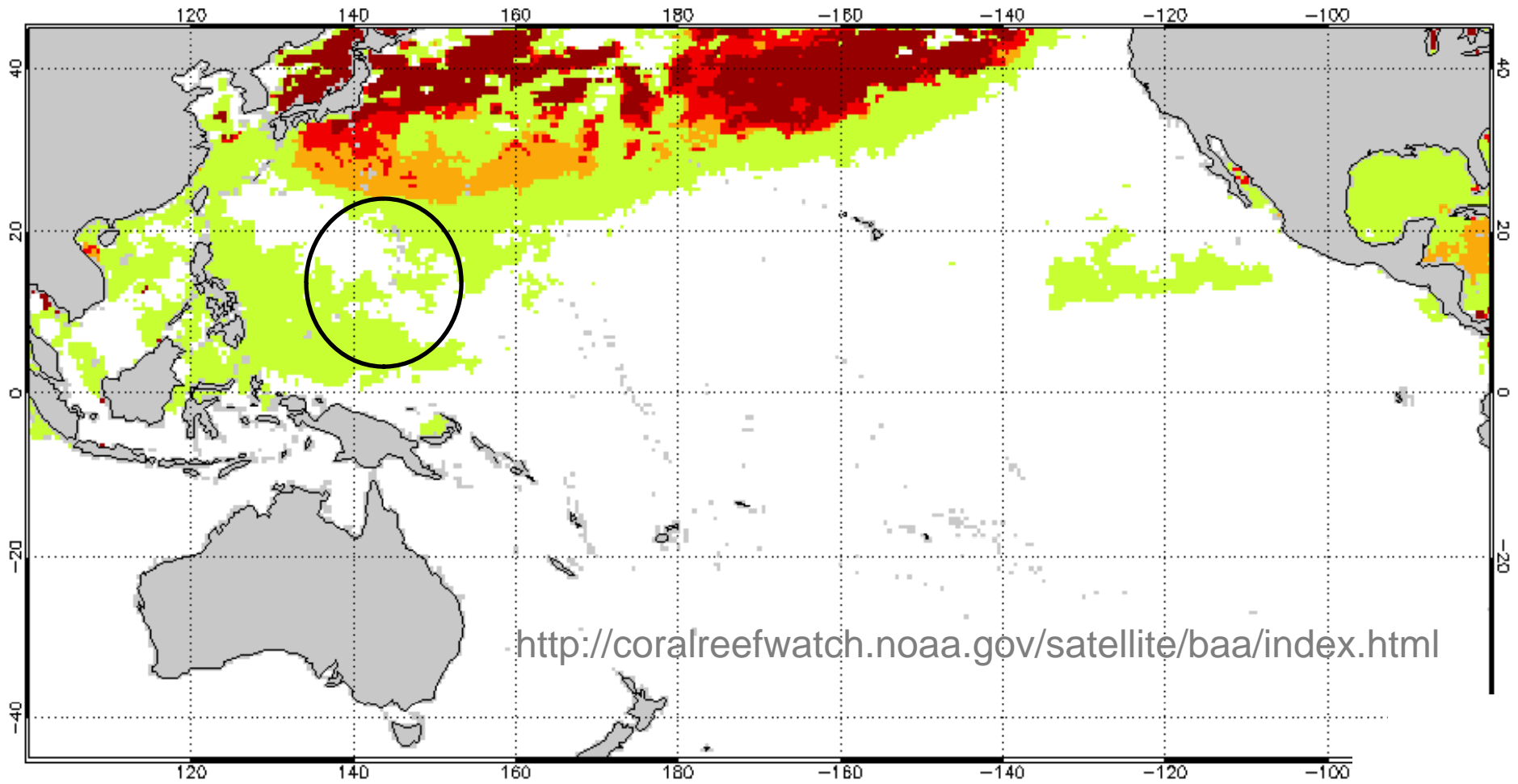




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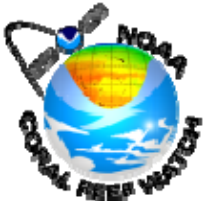


NOAA Coral Reef Watch Satellite Coral Bleaching Alert Area
13 Sep 2010



<http://coralreefwatch.noaa.gov/satellite/baa/index.html>

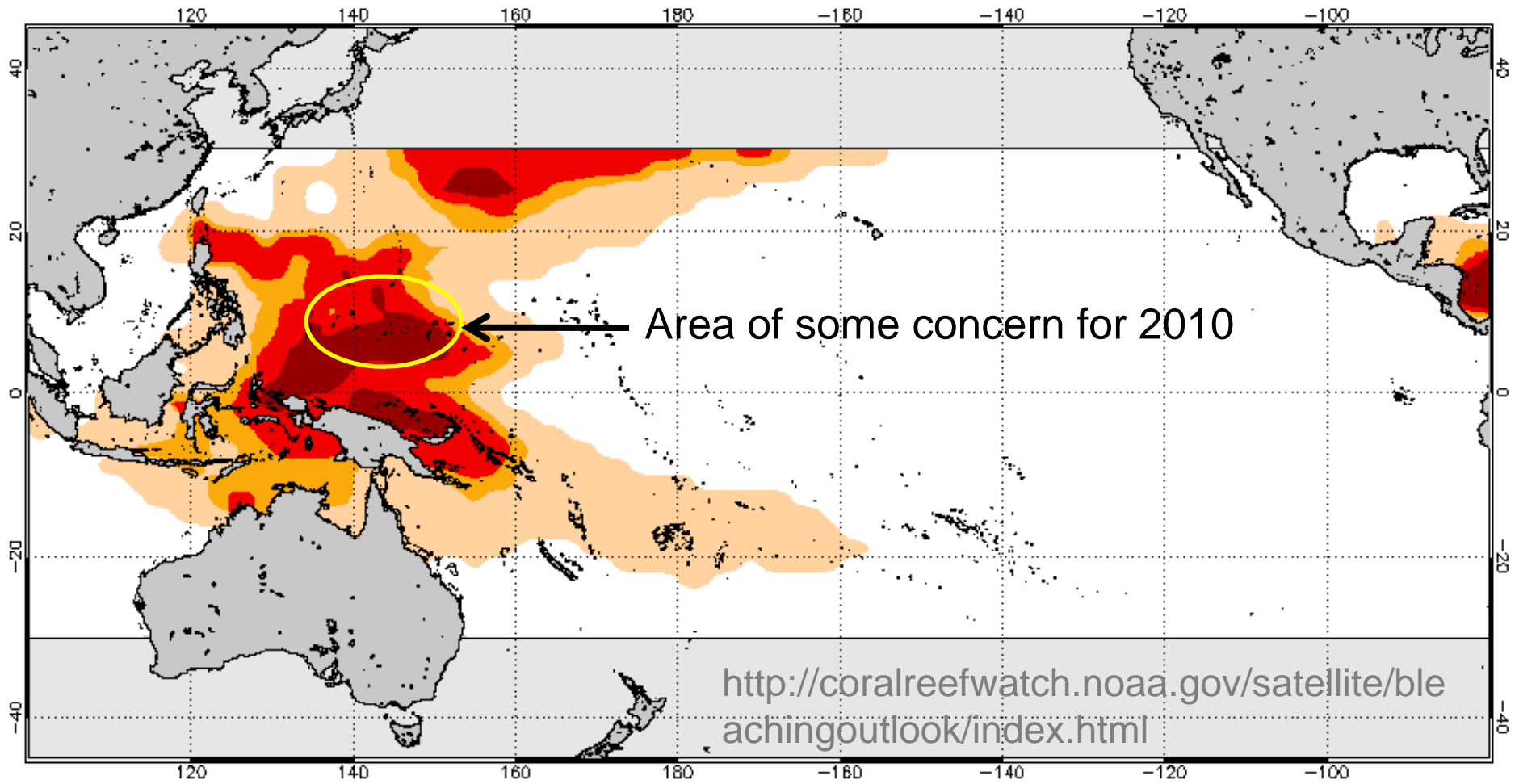




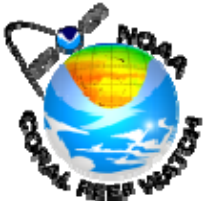
Seasonal Bleaching Outlook



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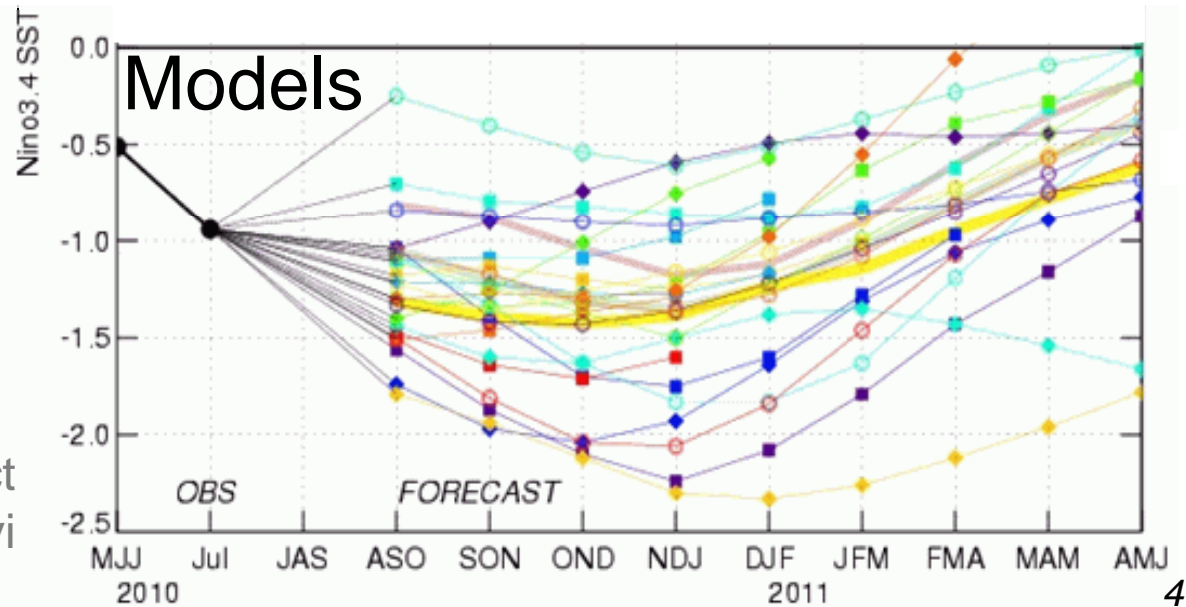
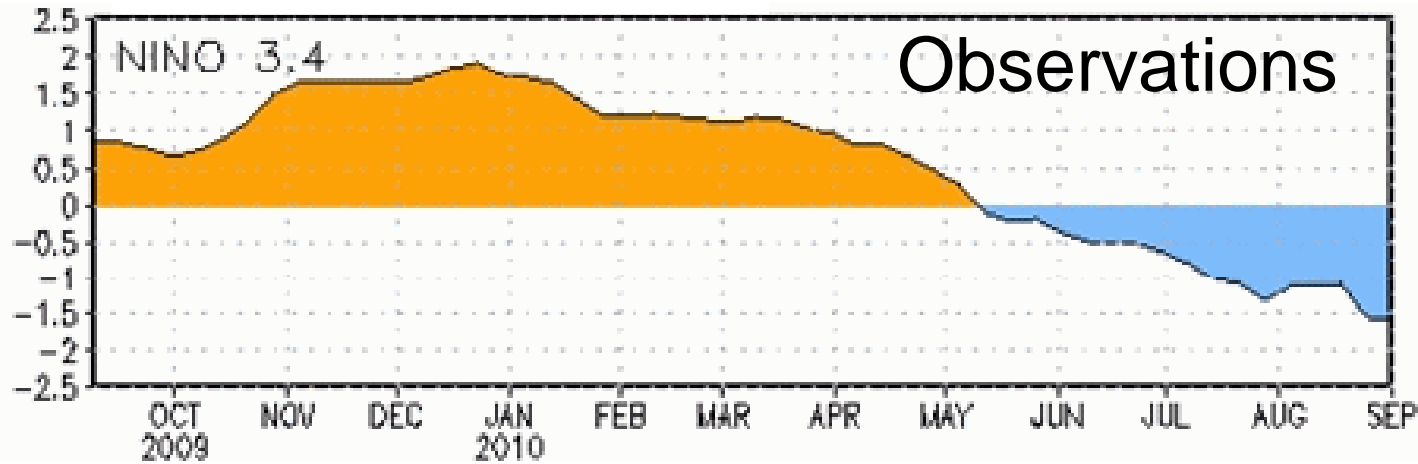
Potential Stress Level: Watch Warning Alert Level 1 Alert Level 2



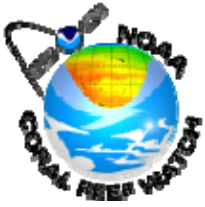
El Niño / La Niña Update



SST Anomaly



http://www.cpc.noaa.gov/products/analysis_monitoring/enso_advisory/ensodisc.html



Bleaching Outlook for 2010



Caribbean:

- Major concern for bleaching across Caribbean basin in 2010
- Model output plausible and predicting higher thermal stress than 2005

Pacific:

- Some potential for bleaching in region from Guam to Palau to Chuuk
- Model currently over-predicting from observations
- But, formation of La Niña could be a problem in Pacific



Activate Bleaching/Crisis Response Plans



Elements of a Plan:

- Assess ecological impacts
- Assess socio-economic impacts
- Communicate
- Management interventions
- Funding, Capacity
- Support Decision-makers / Stakeholders





Questions?

