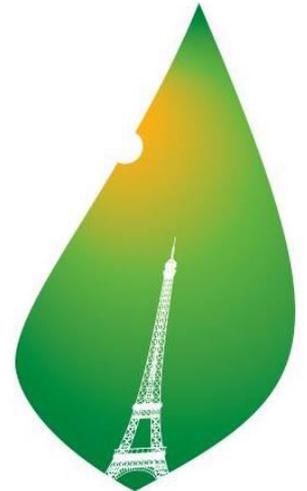


# **Introduction to COP21 Briefing:**

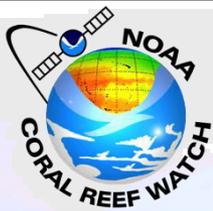
## **What did COP21 Mean to Corals?**

**C. Mark Eakin**  
**NOAA Coral Reef Watch**



**PARIS2015**  
CONFÉRENCE DES NATIONS UNIES  
SUR LES CHANGEMENTS CLIMATIQUES  
**COP21·CMP11**

# 2015 Coral Bleaching: American Samoa



December 2014

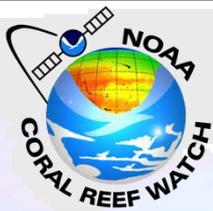


XL CATLIN  
SEAVIEW™  
SURVEY



<http://coralreefwatch.noaa.gov>

# 2015 Coral Bleaching: American Samoa



February 2015

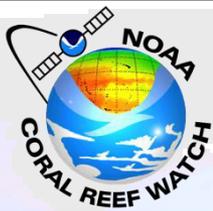


XL CATLIN  
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SURVEY



<http://coralreefwatch.noaa.gov>

# 2015 Coral Bleaching: American Samoa



August 2015



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**SEAVIEW™**  
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<http://coralreefwatch.noaa.gov>

# Climate Change Threatens the Survival of Coral Reefs

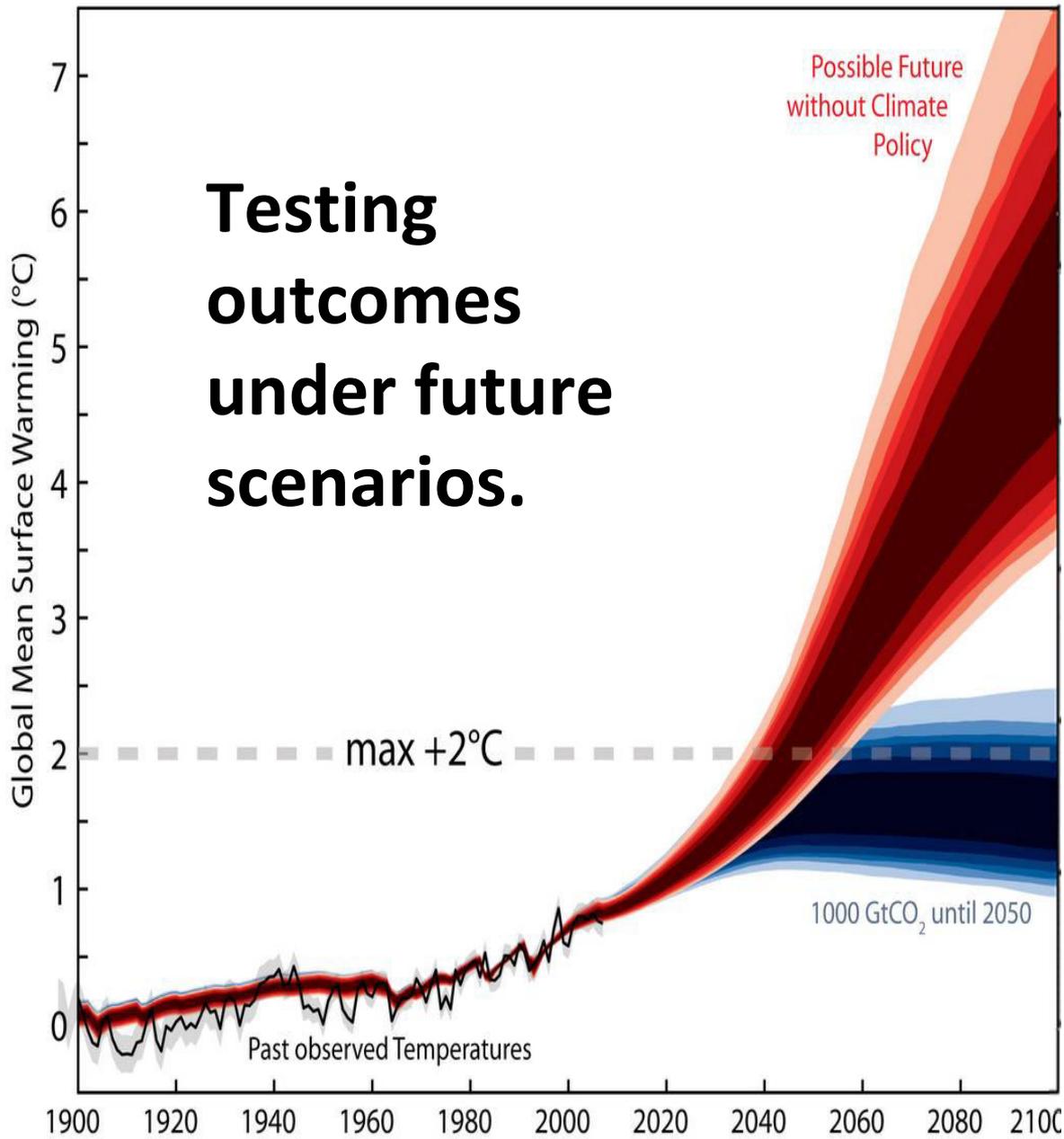


If average global surface temperatures increase by 2°C or more, relative to the pre-industrial period, the resultant ocean warming, along with acidification, will lead to continued widespread destruction of coral reef ecosystems over the next few decades.

The emission reduction pledges submitted to date by the international community fall well short of what is required needed to avoid this biodiversity catastrophe.



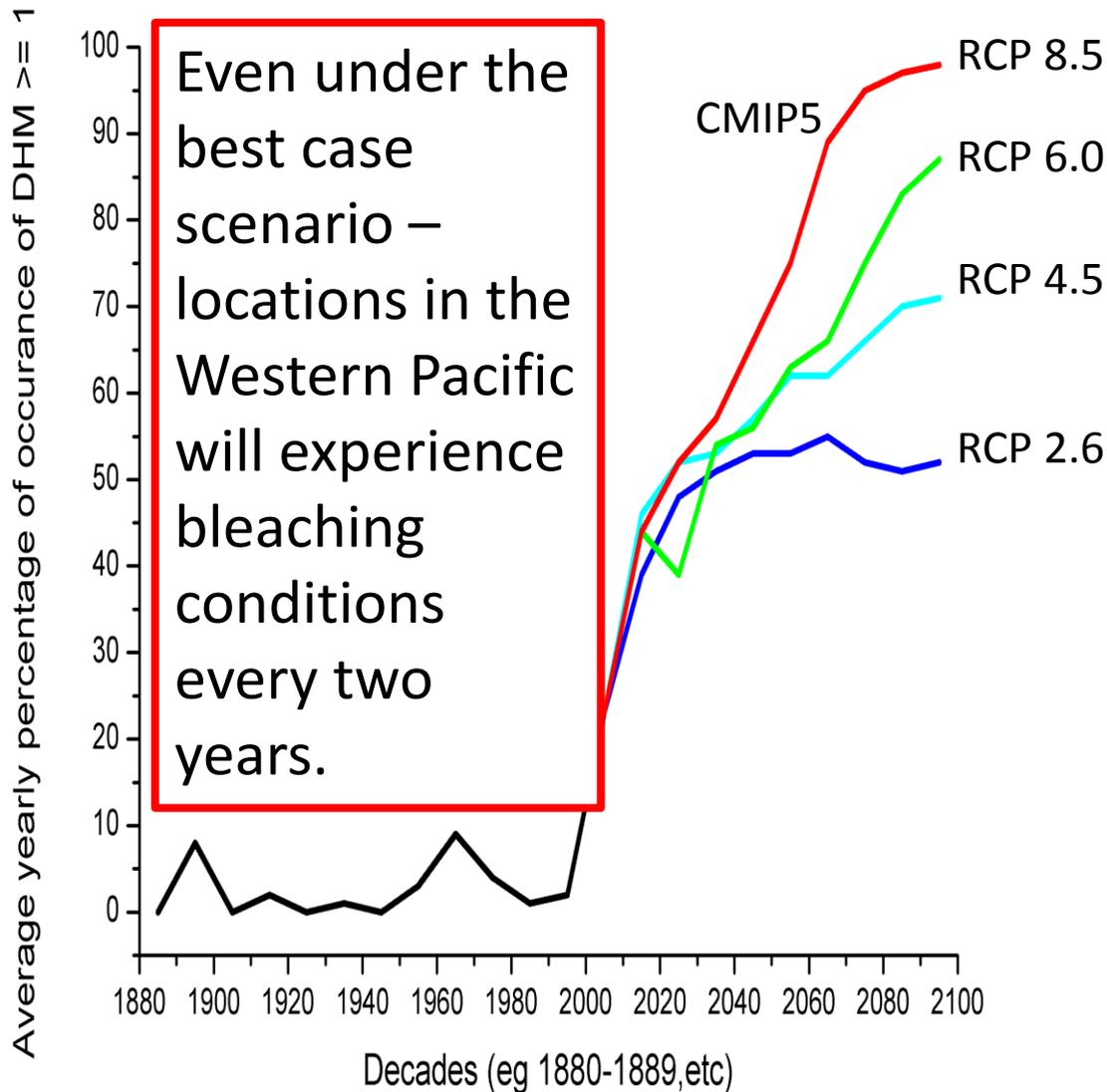
***ISRS Consensus Statement on Climate Change and Coral Bleaching, October 2015***



**Testing  
outcomes  
under future  
scenarios.**

# Updating the analysis (CMIP5)

## WESTERN PACIFIC



Western Pacific Bleaching

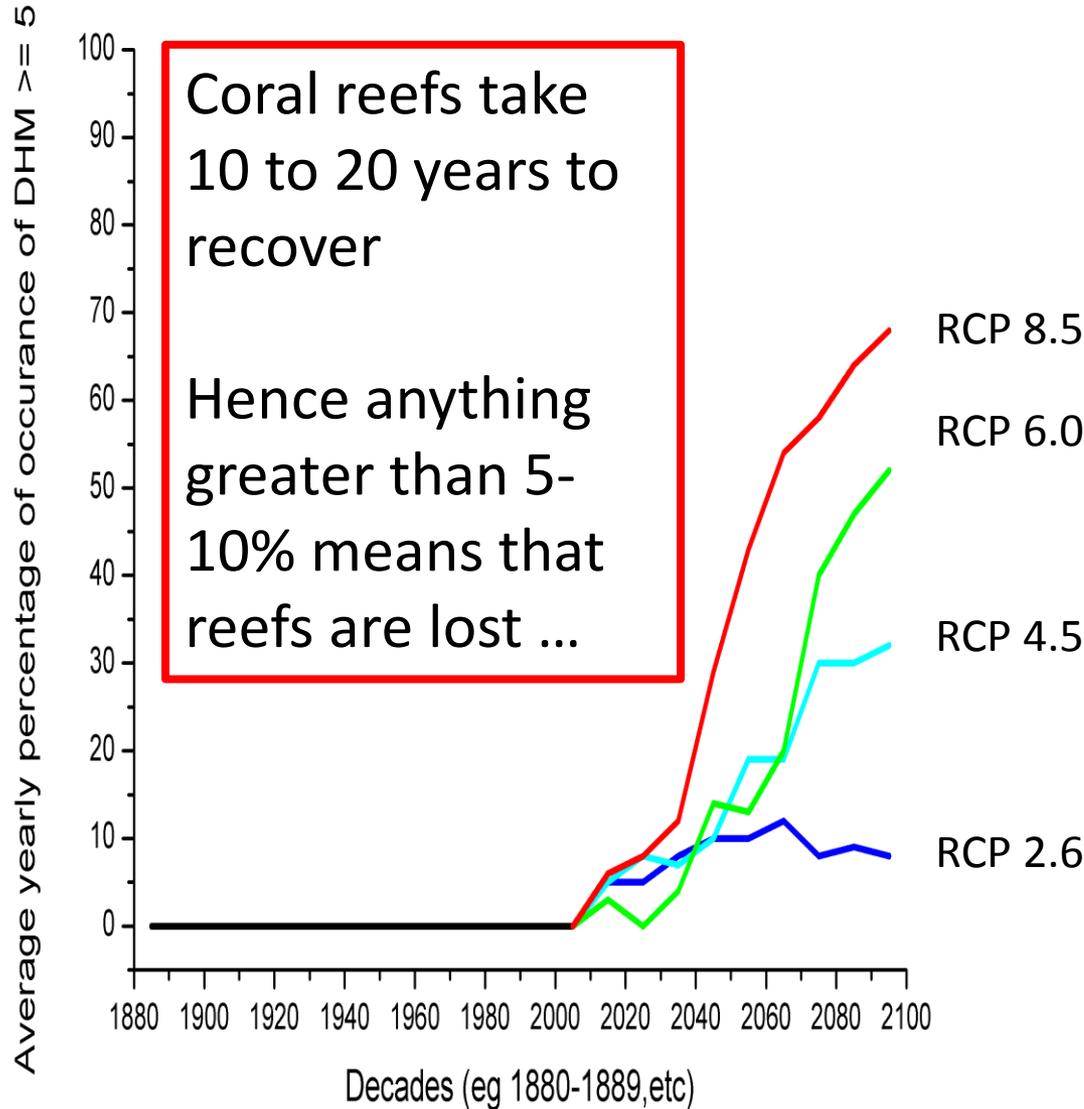
Average yearly percentage of occurrence of DHM  $\geq 1$  (representative of coral bleaching events)



Hoegh-Guldberg, et al. (in prep)

# Updating the analysis (CMIP5)

## WESTERN PACIFIC



Average yearly percentage of occurrence of DHM  $\geq 5$  (representative of coral mass mortality events)

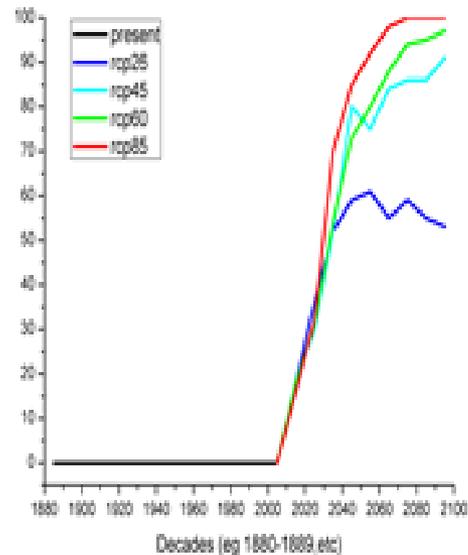


Hoegh-Guldberg, et al. (in prep)

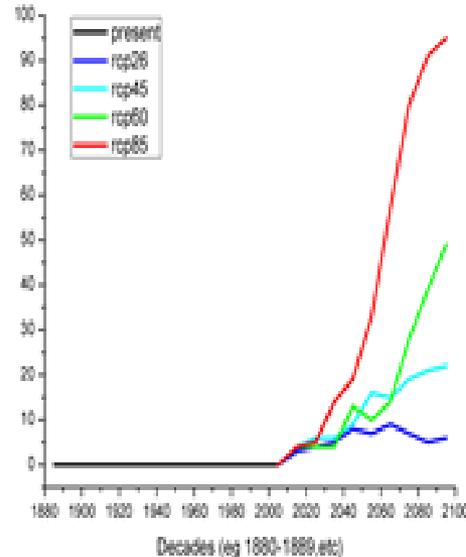
# Global Patterns

## B. Average % of events per year of DHM 5 and above (representative of 'mass coral mortality events')

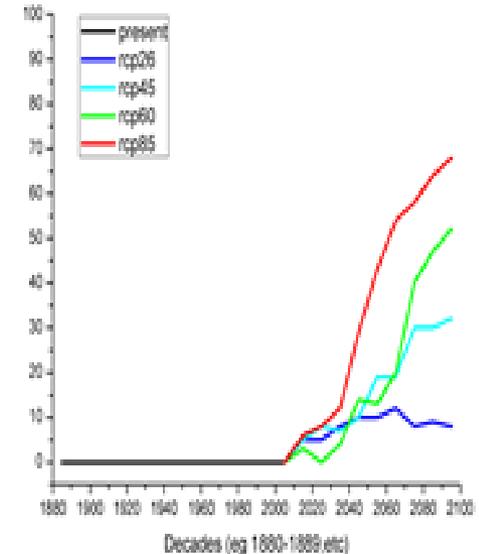
### Caribbean



### Coral Triangle



### Western Pacific



Historic

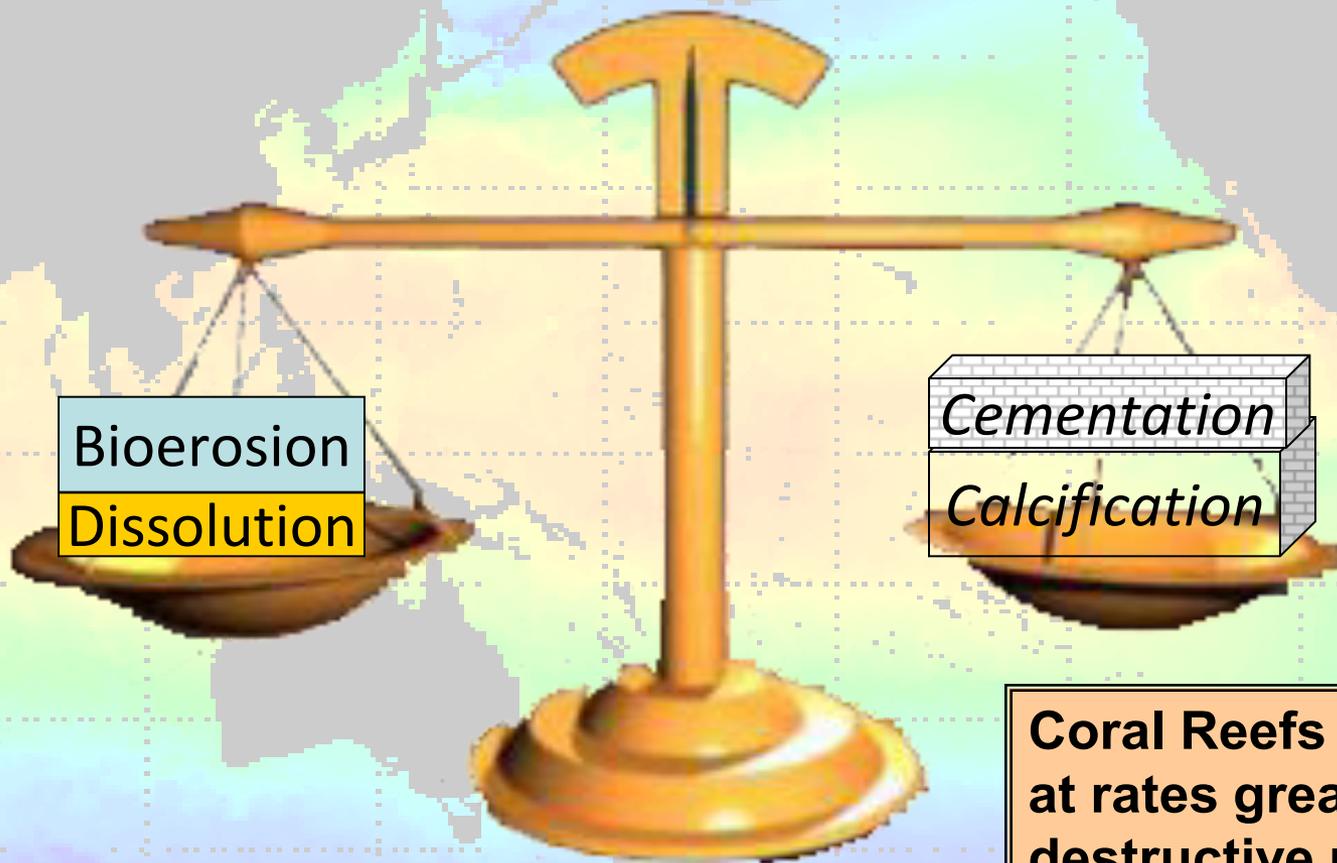
RCP 2.6

RCP 4.5

RCP 6.0

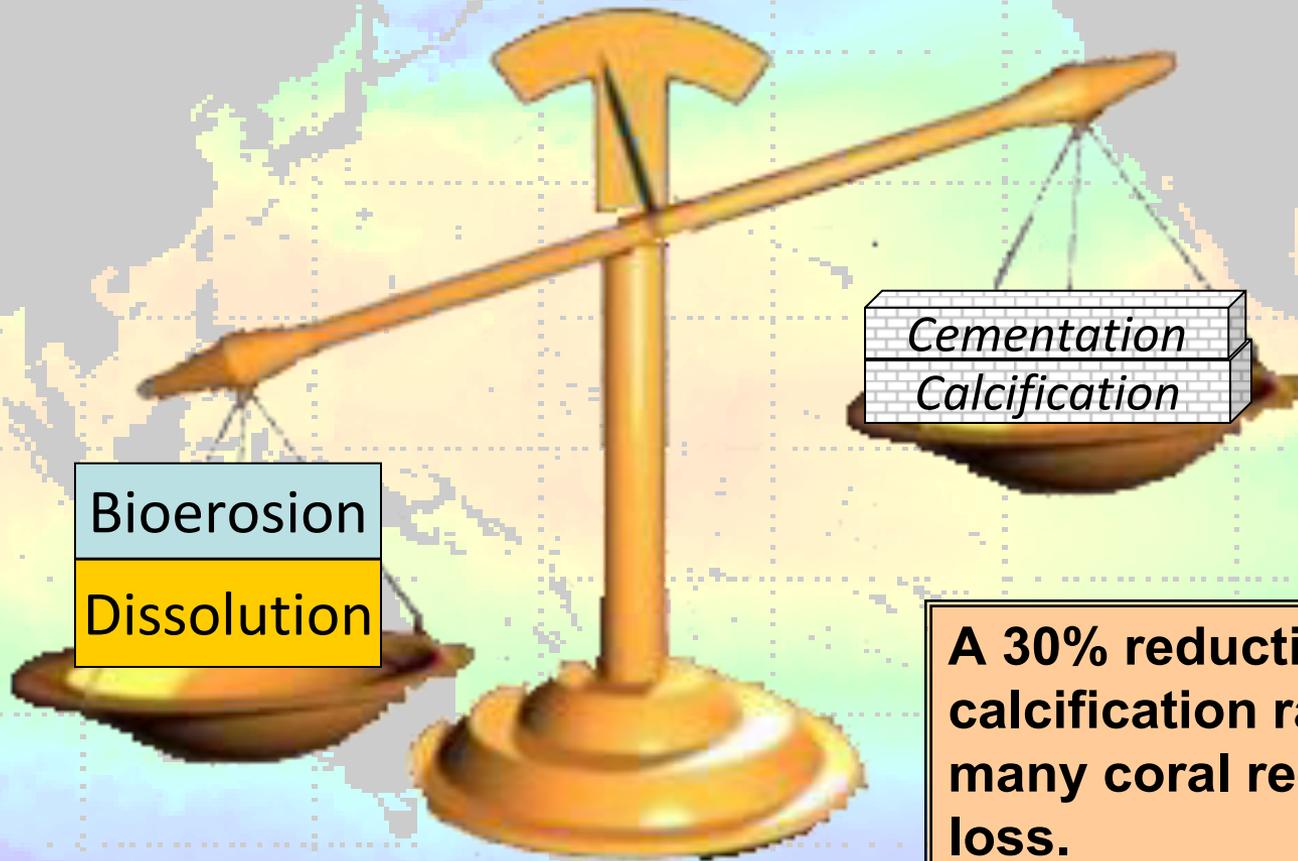
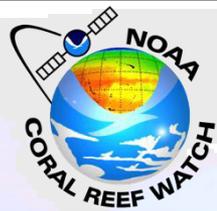
RCP 8.5

# Added Impact of Ocean Acidification



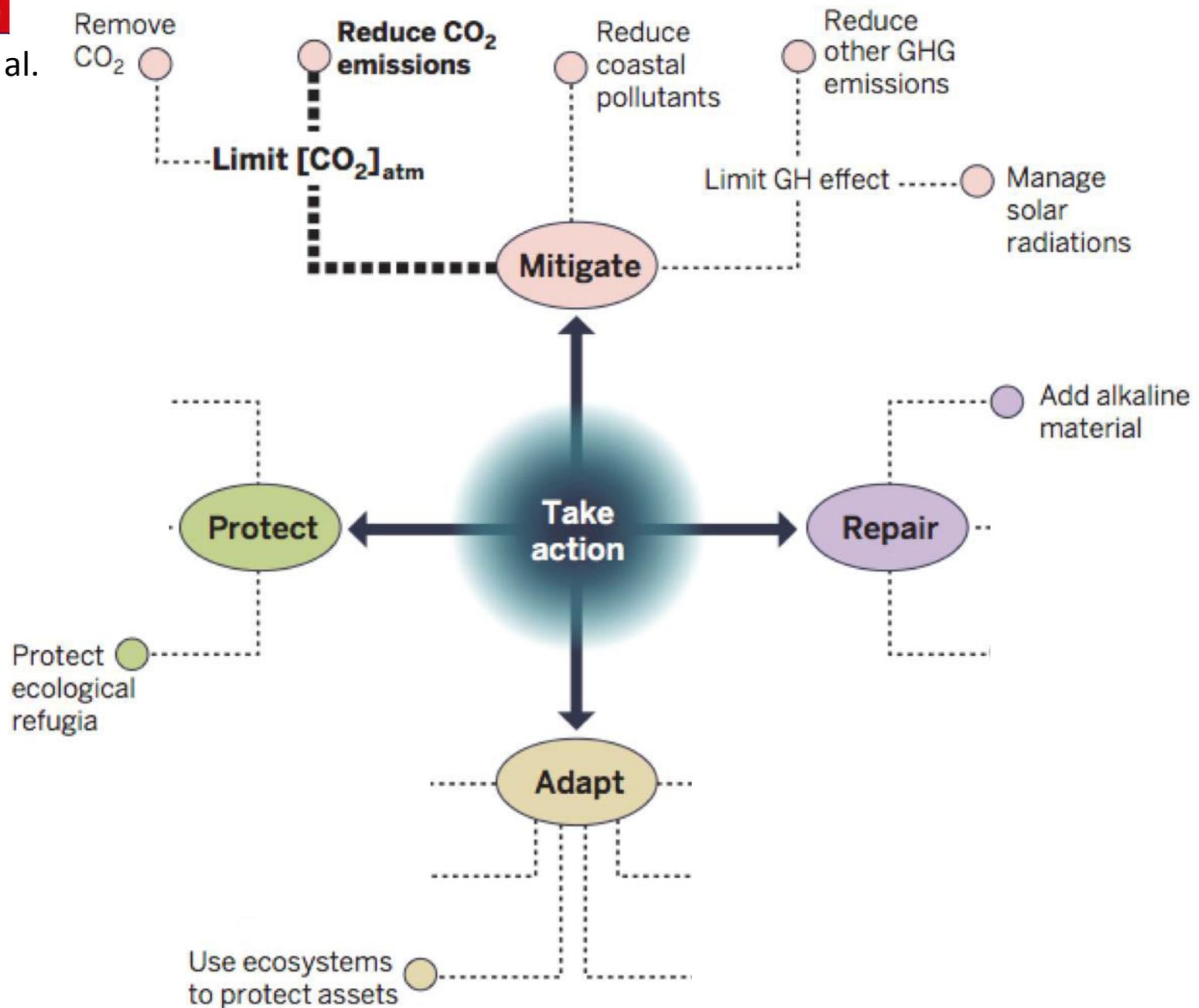
**Coral Reefs need to calcify at rates greater than destructive processes to grow.**

# Added Impact of Ocean Acidification



**A 30% reduction in calcification rate could push many coral reefs into net loss.**





## Climate Change Threatens the Survival of Coral Reefs

Coral reefs are structures on the planet. They provide food and support (through such as

Coral reefs, however, are threatened by increasing sea temperatures and rising carbon dioxide levels are causing ocean acidification, which leads in turn to the loss of many

Over recent decades, 33-50% of coral reefs have died due to a combination of factors and global climate change. Extensive degradation will increase

As a result of reef ecosystem degradation, economic losses will expose

If average global surface temperature increases by 1.5°C, coral reef ecosystems over the next few decades will fall well short of what is required to avoid this biodiversity catastrophe.

The International Society for Reef Studies thus calls on all nations and negotiators at the Paris Climate Change Conference to commit to limiting atmospheric carbon dioxide (CO<sub>2</sub>) concentrations to no more than 450 ppm in the short-term, and reducing them to 350ppm in the long-term.

This should keep average global temperature increase to less than 2°C (or 3.6°F) in the short-term, and less than 1.5°C (or 2.7°F) in the long-term, relative to the pre-industrial period. This would prevent global collapse of coral reef ecosystems and allow coral reefs to survive in perpetuity.

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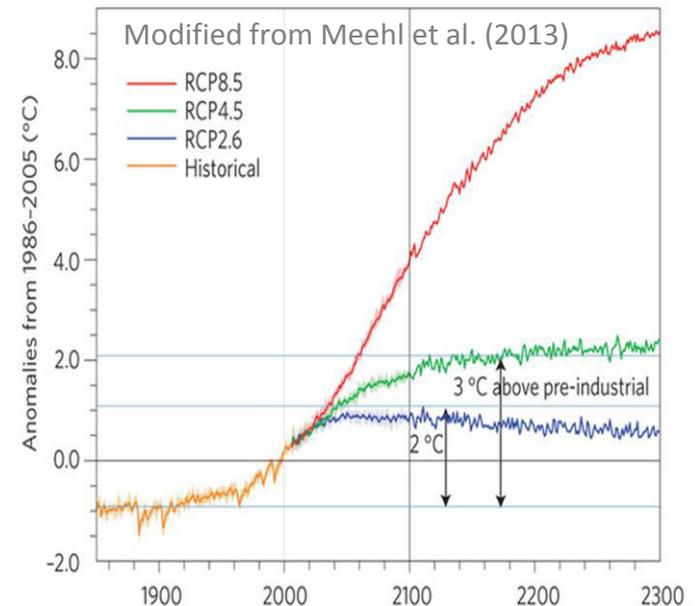
*The International Society for Reef Studies (ISRS) is the leading international association for coral reef scientists and managers. Its members carry out and publish work that promotes scientific knowledge and understanding of coral reef ecosystems.*  
[www.coralreefs.org](http://www.coralreefs.org)

*ISRS Consensus Statement on Climate Change and Coral Bleaching, October 2015  
Prepared for the 21<sup>st</sup> Session of the Conference of the Parties to the United Nations Framework Convention on Climate Change, Paris, December 2015.*

# Key statement accepted by COP21

*Emphasizing with serious concern the urgent need to address the significant gap between the aggregate effect of Parties' mitigation pledges in terms of global annual emissions of greenhouse gases by 2020 and aggregate emission pathways consistent with holding the increase in the global average temperature to well below 2 °C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5 °C,*

At last, a potential future that is relatively safe and which is consistent with the latest science



# Nations Unies

## Conférence sur les Changements Climatiques 2015

COP21/CMP11

Paris France

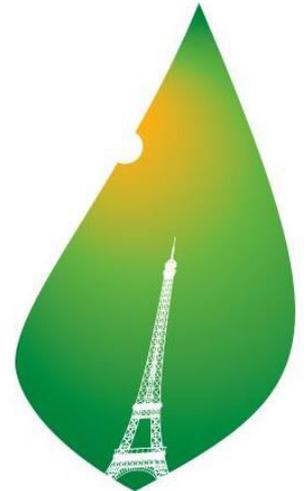


**#ParisAgreement**

**"Long live the planet.  
Long live Humanity. Long live life itself."**

# Briefing and Discussion on COP21 Proceedings

Richard J. Driscoll, *U.S. Department of State*



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