“I did grow up in Hawaii. There are coral reefs in Hawaii that when I was growing up, were lush and full of fish, that now, if you go back, are not.”

President Obama on harms caused by climate change, September 2015
- The Ocean has absorbed about 30% of CO2 emitted by humans.
- This uptake of CO2 led to an estimated 26% increase in ocean acidity.
- Coral reefs are one of the most vulnerable marine ecosystems.
- Over half of world’s reefs are under medium to high degradation risk; under the 4.5 degree scenario, the degradation risk increases to $\frac{2}{3}$rd.
- Mass coral bleaching and mortality, triggered by positive temperature anomalies, are the most widespread impacts.
- Abundance of reef-building corals has decreased by over 80% on many Caribbean reefs, with a dramatic phase shift from corals to seaweeds.

**Cold-water corals**

<table>
<thead>
<tr>
<th>$pCO_2$ (µatm)</th>
<th>7</th>
<th>4</th>
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<th>5</th>
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**Warm-water corals**

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- Positive effect
- No effect
- Negative effect
Building Resilience

- Coral reefs help protect the shoreline from destructive force of storm surges & hurricanes -- highlighted in 2014 Priority Agenda on Resilience.

- Marine protected areas and fisheries management can increase ecosystem resilience and increase the recovery of coral reefs after climate change impacts, such as mass bleaching.

- In long term, limiting ocean warming and acidification is central.

- Locally, controlling the input of nutrients and sediment from land is an important tool because nutrient enrichment can increase coral bleaching and pollutants can increase acidification.

- US government promotes resilience with 2013 Executive Order 13653:
  - Creates Task Force with state, local and tribal leaders.
  - Over 30 Federal agencies now have Climate Change Adaptation Plans.
  - Manages lands and waters for climate preparedness and resilience.
  - Provides information, data and tools for climate change resilience.
Four Pillars of Paris

1) **AN AGREEMENT** – that is lasting, applicable to all, sustainable, which can assess and revise commitments.

2) **INDCs** -- intended nationally determined contributions.

3) **FINANCE AND TECHNOLOGY** -- to support developing countries that are vulnerable or in need of help.

4) **NON-STATE PLAYERS** -- engagement by sub-nationals, companies, and civil society, through Lima-Paris Action Plan.
The Paris Agreement Key Elements

• Strengthen long-term ambition with well below two degrees Celsius goal and global peaking

• Establish a universal approach, locking in five-year target cycles, and ratcheting up ambition over time

• Putting in place enhanced transparency system for all countries, with greenhouse gas inventories for first time & report on progress against targets

• Enhanced focus on adaptation

• Underscoring commitment to climate finance and technical assistance for developing countries
International Cooperation

• Extensive cooperation with China, leading to key joint presidential announcements.

• Bilateral assistance, especially with India and "low emissions development strategies"

• Over $7.5 billion in "fast start" assistance from 2009-2012, and now pledge of $3 billion to Green Climate Fund
Climate Change Regimes

- Kyoto Protocol
- Copenhagen Accord
- Paris Agreement

UNFCCC Participation
Greenhouse Gas Emissions
The U.S. Intended Nationally Determined Contribution

PRESIDENT OBAMA IS COMMITTED TO CUTTING U.S. CARBON POLLUTION BY 26-28% BY 2025

MILLION MIRCROS CUBIC DIOXIDE EQUIVALENT


HISTORIC EMISSIONS
U.S. PROJECTED EMISSIONS IN 2008
U.S. PROJECTED EMISSIONS UNDER 2020 TARGET
U.S. PROJECTED EMISSIONS UNDER 2025 TARGET

PRESIDENT OBAMA TAKES OFFICE
17% BELOW 2005 LEVELS IN 2020

26% - 28% BELOW 2005 LEVELS IN 2025

WH.GOV/CLIMATE-CHANGE #ActOnClimate
CLIMATE FINANCE

(OECD October 2015 Report)

- US$30B+ -- 2010-2012
- US$52.3B -- 2013
- US$61.8B -- 2014

- Fast Start Public Finance (2010-2012)
- Bilateral Public Finance
- Multilateral Public Finance (Attributed)
- Export Credits
- Mobilized Private Co-Finance (Attributed)
Some Basis for Long-Term Optimism

Since 2013, global carbon pollution from the energy sector has remained flat while the global economy grew by 3%.
THANK YOU

-Richard J. Driscoll, Office of Global Change, Acting Deputy Director  DriscollRJ@state.gov