The Pacific Islands Regional Climate Assessment (PIRCA)

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October 23, 2014. Climate Change and Health Meeting
Hawaii State Capitol.

• US Global Change Research Act of 1990
• Helps federal government prioritize science investments
• Third US National Climate Assessment
  • PIRCA, December 2012
  • NCA released by White House, May 2014
  • http://nca2014.globalchange.gov/
  • Chapter 23: Hawaii and the US Affiliated Pacific Islands

Collaborators

Geographical Scope

Regional Climate Provinces:
(1) Western North Pacific
(2) Central North Pacific
(3) Central South Pacific

Products

• DOWNLOAD: www.eastwestcenter.org/PIRCA
• Climate Change and Pacific Islands: Indicators and Impacts
• Case Studies
• Executive Summary
• NCA Pacific Islands chapter (2013)
• PIRCA Impacts & Adaptations Fora
  - Suva, Fiji, Jan. 2013
Indicators of a Changing Climate in the Pacific Islands Region

Freshwater Supplies are Limited and Threatened
- Pacific Islands have limited and fragile freshwater Resources
- The Pacific Islands region has high natural climate variability. This makes it difficult to detect long-term regional climate trends and make accurate predictions
- To accurately assess trends in water resources as climate changes, data and basic monitoring are needed

Key Messages
Average, max, and min air temperatures rising
Fresh water supplies more limited
Coastal flooding and erosion
Changes in marine ecosystems
Native plant & animal stress/extinction
Increasing migration
Threats to agriculture & indigenous cultures
Changing rainfall amounts and patterns
Changing frequency/intensity of wind, waves, and storms

Air Temperature is Rising
- Average, min, and max air temperature has risen significantly in Hawai‘i in the past 100 years
- This has accelerated in the past 30 years
- Increasing air temperature is more rapid at high-elevations (>0.5 mile above sea level)

Hazard Mitigation Plans

Precipitation & Drought Patterns are Changing
Annual precipitation has decreased significantly in the past 30 years in Hawai‘i
In the past 30 years, all Hawaiian Islands have experienced greater numbers of consecutive dry days, and fewer days of intense rainfall
Base Flow in Streams is Decreasing

In Hawai'i, base flow, the groundwater component of streamflow, has shown significant downward trends of 20-70% in the past 100 years.

Climate change will force human migration

- There is no single legal entity that governs climate migrants
- Projections of the number of global climate migrants by 2050 range from 25 million to 1 billion
- Unlike other populations, many Pacific Islanders will not be able to migrate domestically
- (3/9/13) PACOM Chief calls climate change biggest security threat to Pacific Region:

  "The ice is melting and sea is getting higher," Locklear said, noting that 80 percent of the world’s population lives within 200 miles of the coast. The US military, he said, is beginning to reach out to other armed forces in the region about the issue.


Precipitation Extremes

- We have entered a period of fewer average storms in the Central North Pacific storm basin since the mid-1990s
- Generally, future extreme rainfall in Hawaii is projected to be less frequent, but storms that do hit will be more intense

Climate and Human Health in Hawaii

- A GAP in climate relevant health-related data and impacts
- Freshwater quality and quantity, economics of potable water
- Rising temperatures: increasing heat related impacts
  - Dengue mosquito habitat, new diseases
- Intense rainfall: 10” in 24-hours shut down the Waimanolo Gulch landfill in 2010
  - Flooding, ponding
- Drought: Food security, sustainable development
- Impacts tend to hit the most vulnerable populations first: climate-induced migrants

Sea Level is Rising

- Since the 1990s, the rate of globally averaged sea-level rise has been ~0.13 inches per year
- This is twice the estimated rate for the 20th century as a whole
- Climate model projections (that do not include ice-sheet contributions) are for an 6 to 24 inch rise in global sea level by 2100

Data & Observations are Needed to Support Adaptation and Management

- The Pacific Islands region has experienced a decrease in climate monitoring stations
  - Rainfall, streamflow, waves, and ecosystem data are all critical
- The ability to assess future climate changes in meaningful detail is at risk
Partnerships Between Research Scientists and Decision-Makers are Crucial

- The Pacific Islands face complex and multidimensional problems
- Neither science nor management alone can adequately address climate change impacts
- Everyone can join the PIRCA sustained assessment process

To Download the PIRCA Reports:
http://www.eastwestcenter.org/PIRCA

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Photo: Diana Kim, 2012