



Pacific Reef Assessment and Monitoring Program

Ocean and Climate Change Monitoring Summary

American Samoa 2018¹

Introduction

The Ecosystem Sciences Division (ESD) of the Pacific Islands Fisheries Science Center monitors physical and chemical oceanographic conditions to investigate the long-term impacts of climate change and ocean acidification on coral reef ecosystems of the U.S.-affiliated Pacific islands. These research efforts have established temporal and spatial baselines that are being used to understand changes over time. During the 2018 Pacific Reef Assessment and Monitoring Program (Pacific RAMP) research expedition, ESD completed climate impact assessment surveys in American Samoa. This summary report provides a brief overview of survey effort and preliminary data.

Survey effort

Climate impact assessment surveys in American Samoa occurred from May 31 to July 13, 2018, at the following locations: Swains Island, Tutuila, Ofu and Olosenga Islands, Tau and Rose Atoll. A range of instrumentation and survey techniques were used to investigate water temperature, water chemistry, physical dynamics of water motion, and biological reef accretion and bioerosion.

Table 1. Summary climate impact assessment surveys from the research expedition in American Samoa. Instruments are abbreviated as follows: STR (subsurface temperature recorder), CAU (calcification accretion unit), BMU (bioerosion monitoring unit), CTD (conductivity temperature and depth), and EAR (ecological acoustic recorder).

Activity	Tutuila	Ofu	Olosenga	Rose	Swains	Ta'u
STR Deployment	19	10	0	6	6	11
STR Retrieval	15	8	0	5	7	9
CAU Site Deployed	7	4	1	4	4	5
CAU Site Recovered	10	4	1	5	5	5
BMU Site Deployed	4	2	0	0	0	2
BMU Site Recovered	4	2	0	0	0	2
CTD Cast and Water Sample	30	16	0	9	13	5
Diel Suite Investigation	1	0	0	0	0	0

¹ PIFSC Data Report DR-19-034.
Issued 05 September 2019.

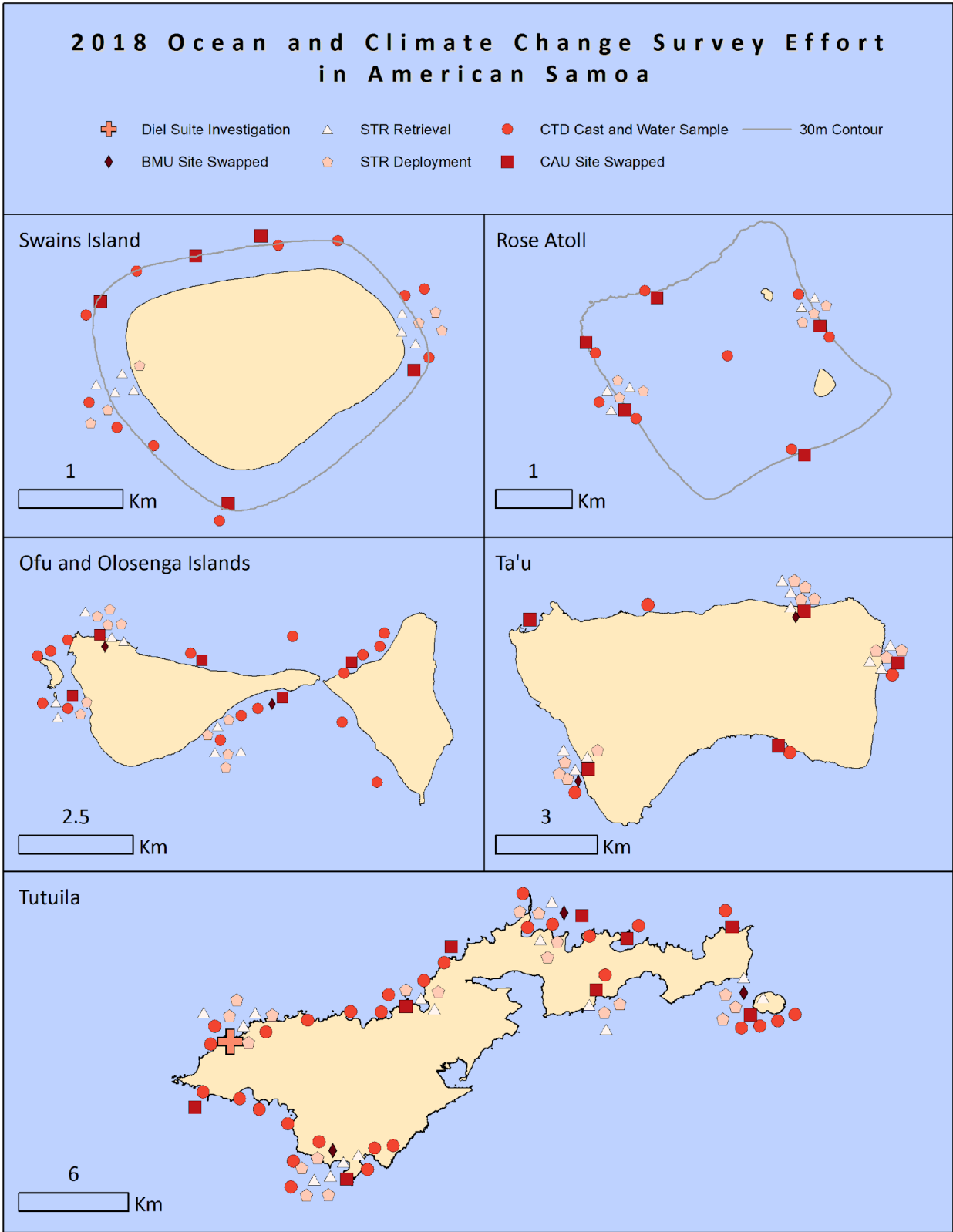


Figure 1. Locations of climate impact assessment surveys American Samoa in 2018. Note: Marker points that share a location are displayed dispersed around that shared location on the map.

Preliminary observations

A brief subset of data generated during the climate impact assessment surveys from 2018 in American Samoa is visualized in the following figures.

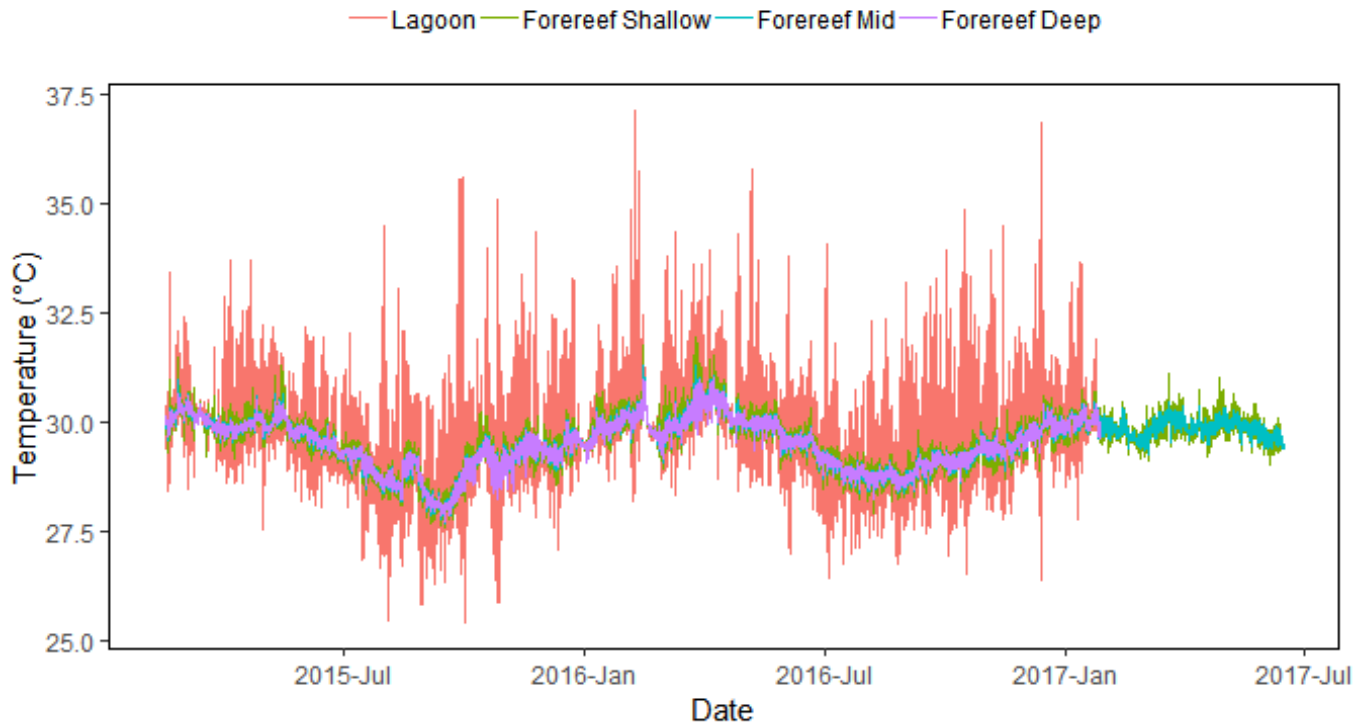


Figure 2. Time series from temperature sensors programmed to sample at 5-minute intervals at Swains Island. Depths per respective zone/strata category are as follows: lagoon (1 m), forereef shallow (6 m), forereef mid (15 m), and forereef deep (25 m). Interannual and seasonal variability are visible between 2015 and 2018.

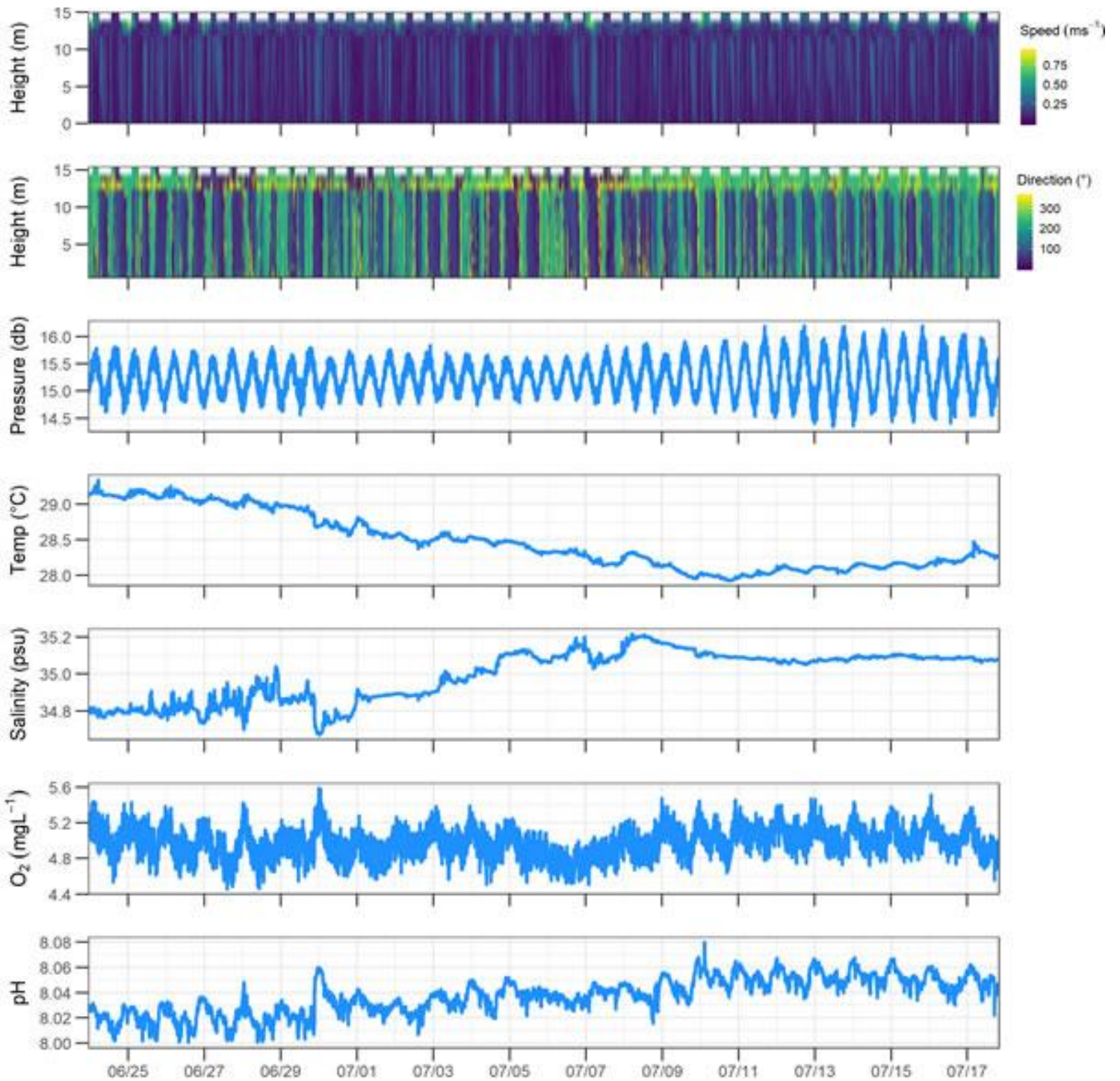


Figure 3. Time series records of current speed, current direction, pressure, temperature, salinity, pH, and dissolved oxygen (DO) from a diel carbonate chemistry monitoring suite deployment at Tutuila from June 23 to July 17, 2018.

Survey sampling design & methods

Climate impact and assessment surveys rely on a diverse array of instruments, sample collections, and survey methods to gain insight into ocean processes influencing coral reef ecosystems across the U.S.-affiliated Pacific Islands.

About the monitoring program

Pacific RAMP forms a key part of the National Coral Reef Monitoring Program of NOAA's Coral Reef Conservation Program (CRCP), providing integrated, consistent, and comparable data across US Pacific islands and atolls. CRCP monitoring efforts have these aims:

- Document the status of reef species of ecological and economic importance
- Track and assess the status and trends of US coral reef ecosystems in response to environmental stressors and human activities
- Evaluate the effectiveness of specific management strategies and identify actions for future and adaptive responses

In addition to the ocean and climate change monitoring outlined here, Pacific RAMP efforts include interdisciplinary monitoring of coral population and benthic communities, fish population and assemblages, invertebrate diversity and abundance, and coral reef habitat assessments and mapping. Data are available upon request.

For more information

[Coral Reef Conservation Program](#)

[NOAA Pacific Islands Fisheries Science Center](#)

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