Stations Everyone

Climate and Weather Affect Everything We Monitor

Climate and weather touch benthic marine communities through warmer ocean temperatures which affect coral growth; and permutations can affect whole reef ecosystems. Precipitation directly affects freshwater animal communities, plant communities, and water quality. Bird breeding cycles can be affected by the changes in seasons, and the list goes on. One of the primary goals of climate and weather monitoring is to determine the status and trends of weather patterns and long-term climate regimes so managers can make informed decisions about the conditions existing in each national park. Similarly, monitoring of weather and climate may provide an early warning of abnormal conditions.

It is therefore very important to get accurate and consistent data from our weather stations. To be useful for statistical analysis, this generally means collecting data more than 85% of the days of the year (300 days or more). The importance of the permanent location of an individual weather station can't be overemphasized either. All long-term (climate change) data is only of value if the station never moves.

Climate/Weather Stations

The Pacific Island Network (PACN) primarily relies on two kinds of weather stations, COOP (Cooperative Observer Program) and RAWS (Remote Automated Weather Stations). COOP stations are checked by specific personnel and gauges need to be read daily. We are grateful for the folks that do this work at the parks. RAWS stations send data via the GOES (NOAA geostationary server) satellite network to WRCC (Western Regional Climate Center) for validation and are then downloaded to the web, where we can retrieve it for specific analyses. Currently, all 10 PACN climate stations (RAWS) are operational and transmitting data every hour to WRCC. These data are then distributed via the internet to various agencies, and also to the public.

RAWS data: http://www.raws.dri.edu/index.html
COOP data: http://www.nws.noaa.gov/om/coop/wfo-rfcmap.htm

In June of 2013, the RAWS climate station at Pu'ukoholā Heiau National Historic Site (PUHE) was vandalized. A new station (above) was installed in January, 2015.

Overview of Island Climate

Climate is generally mild at our monitored national park sites in the Pacific islands. Weather patterns are largely controlled by island geomorphology and the surrounding Pacific Ocean. The ocean temperatures vary only about six degrees throughout the year, from lows near 73° in March to 80° in August. Because there are no continents nearby, weather systems are moderated by the ocean. Seasons are not strongly differentiated either. Two seasons prevail in Hawaii; summer (April through October) and winter (November through March). Dry and wet seasons somewhat correlate with summer and winter, respectively. The wet season in American Samoa is from October through April, and from July through November in the Marianas Islands (Saipan and Guam). Interestingly, in Hawaii, the coldest months are not December and January as they are in the continental United States, but February and March. Cold winds come from the Arctic but the lower temperatures arrive one to two months later due to the lag in the Pacific Ocean's temperature.

–S. Kichman, NPS GIS Specialist (I&M)