Drought in the U.S. Affiliated Pacific Islands:

Drought Monitoring

By: Brian Fuchs (National Drought Mitigation Center), Richard Heim (NOAA NCEI) , David Simeral (Desert Research Institute, Western Regional Climate Center)

Drought monitoring in the United States Affiliated Pacific Islands (USAPI) is currently carried out by NOAA National Center's for Environmental Information (NCEI), the National Drought Mitigation Center (NDMC), United States Department of Agriculture (USDA), NOAA Climate Prediction Center (CPC), and the Western Regional Climate Center (WRCC) in collaboration with National Weather Service (NWS) Offices and other USAPI partners, including Pacific ENSO Application Climate Center. As of March 2019, the USAPI is now part of the regular U.S. Drought Monitor production and has 7 rotating lead authors from NOAA, NDMC, USDA who are responsible for the data analysis and creation of the weekly drought map. It was released online with all the regular products April 8, 2019. The maps are now available at droughtmonitor.unl.edu with the suite of products and data.

The primary quantitative data utilized in the USAPI drought monitoring come from a limited number of observational stations across the USAPI. Historical data are based on NOAA Global Historical Climatology Network-Daily data. In addition, some supplementary data are available from other non-NOAA stations (i.e., National Park Service – American Samoa, Saipan) as well as experimental satellite-based precipitation estimates from NASA SPoRT (Short-term Prediction Research and Transition Center) in cooperation with NOAA. In terms of drought indices, Standardized Precipitation Index (SPI) data are available for some USAPI locations where longer station records exist and can be accessed via the NWS Honolulu at www.prh.noaa.gov/hnl/hydro.

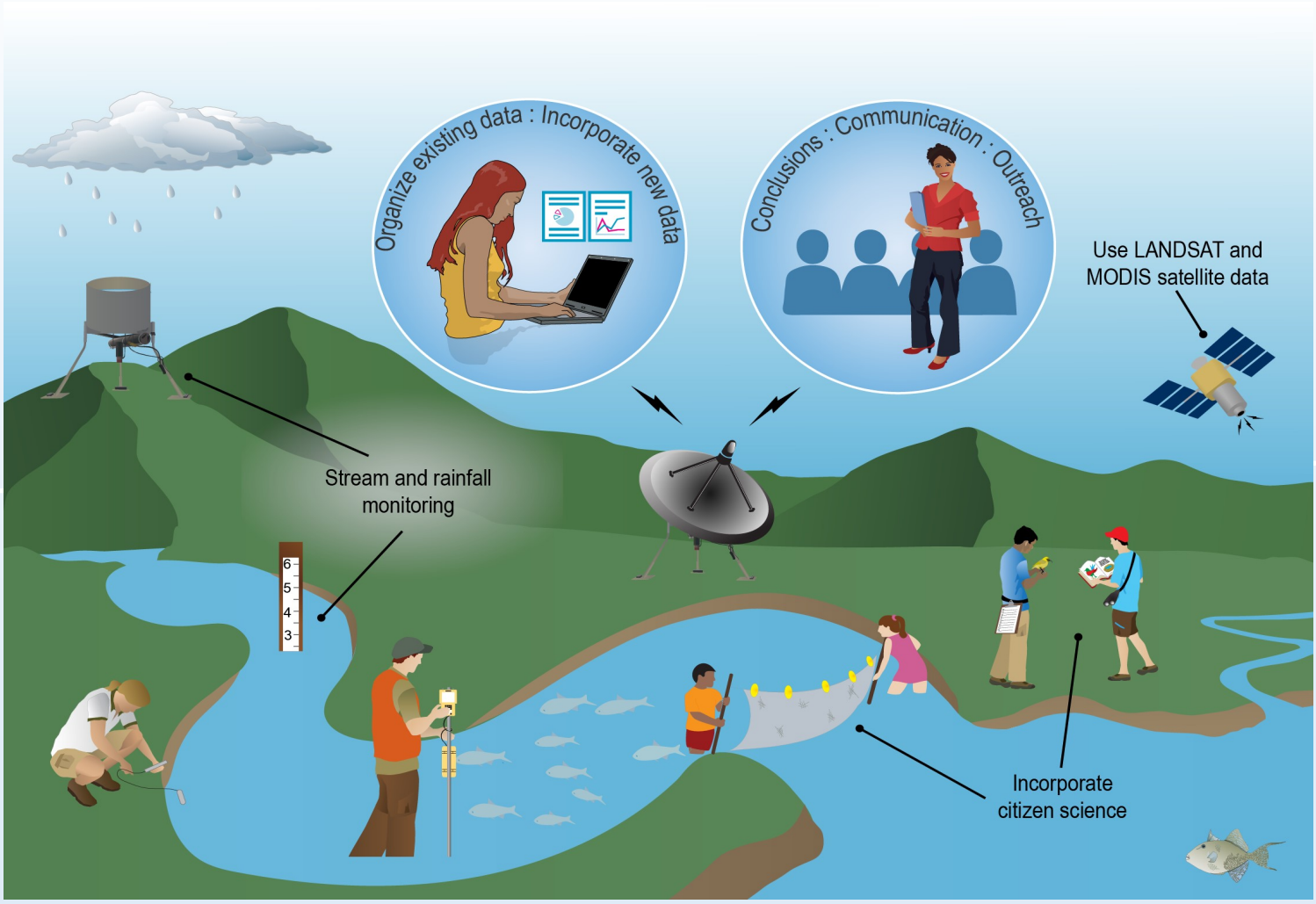

Diagram produced by the Integration and Application Network, University of Maryland Center for Environmental Science (ian.umces.edu).

DATA NEEDS

- Inventory of available resources, stations, and impacts by islands
- Need for systematic collection of impacts related to drought in the region
- Additional observing stations with modern real-time data transmission systems
- Explore computing of satellite-based drought indices through NCEI and other partners
- Additional satellite-based products including vegetation health indices from LANDSAT and MODIS
- Explore deploying soil moisture, groundwater, and streamflow sensors
- Improved timeliness of manually reported station data (e.g., daily rainfall data)
- Incorporate longer, more complete historical rainfall records and determine methods to fill in data gaps
- For station rainfall data, compute SPI or precipitation percentiles for monthly totals and for running 30-day totals, compute number of consecutive days with no rain or little rain below certain thresholds, and the historical frequency of occurrence below these thresholds

CHALLENGES

- Capturing spatial variability of precipitation on the larger high islands where orographic effects influence the amount and distribution of rainfall.
- Some observational data utilized are from low-lying coastal plains and may not be representative of the climatological conditions at higher elevations.
- Cloud cover and spatial resolution for smaller islands can be a limitation when using satellite-based products.
- Funding and staffing for operations and maintenance of existing and new observational sites.

Citizen Science and Outreach

The use of citizen science information and increased outreach to users and among partners is needed:

- **Citizen Science:** Develop and incorporate citizen science data to increase available information.
- **Outreach Efforts for Data Use:** Improve on-the-ground efforts for local outreach and communication, and improve the transitioning of data and information. Use citizen science to engage the public and increase observations and reporting of drought impacts.

References: National Drought Mitigation Center. United States Drought Monitor. Access at https://droughtmonitor.unl.edu/; National Weather Service Honolulu, Hawaii Weather Forecast Office. Standardized Precipitation Index (SPI) Data. Access at www.prh.noaa.gov/hnl/hydro.

Funding provided by the USGS National Climate Adaptation Science Center with in-kind support from Pacific Island Climate Science Center, IAN, and United States Forest Service.

Citation for this report: Fuchs, B., R. Heim, and D. Simeral. 2019. Drought in the U.S. Affiliated Pacific Islands: Drought Monitoring. 2p. https://www.sciencebase.gov/catalog/item/5cdd565be4b0292737463434.