

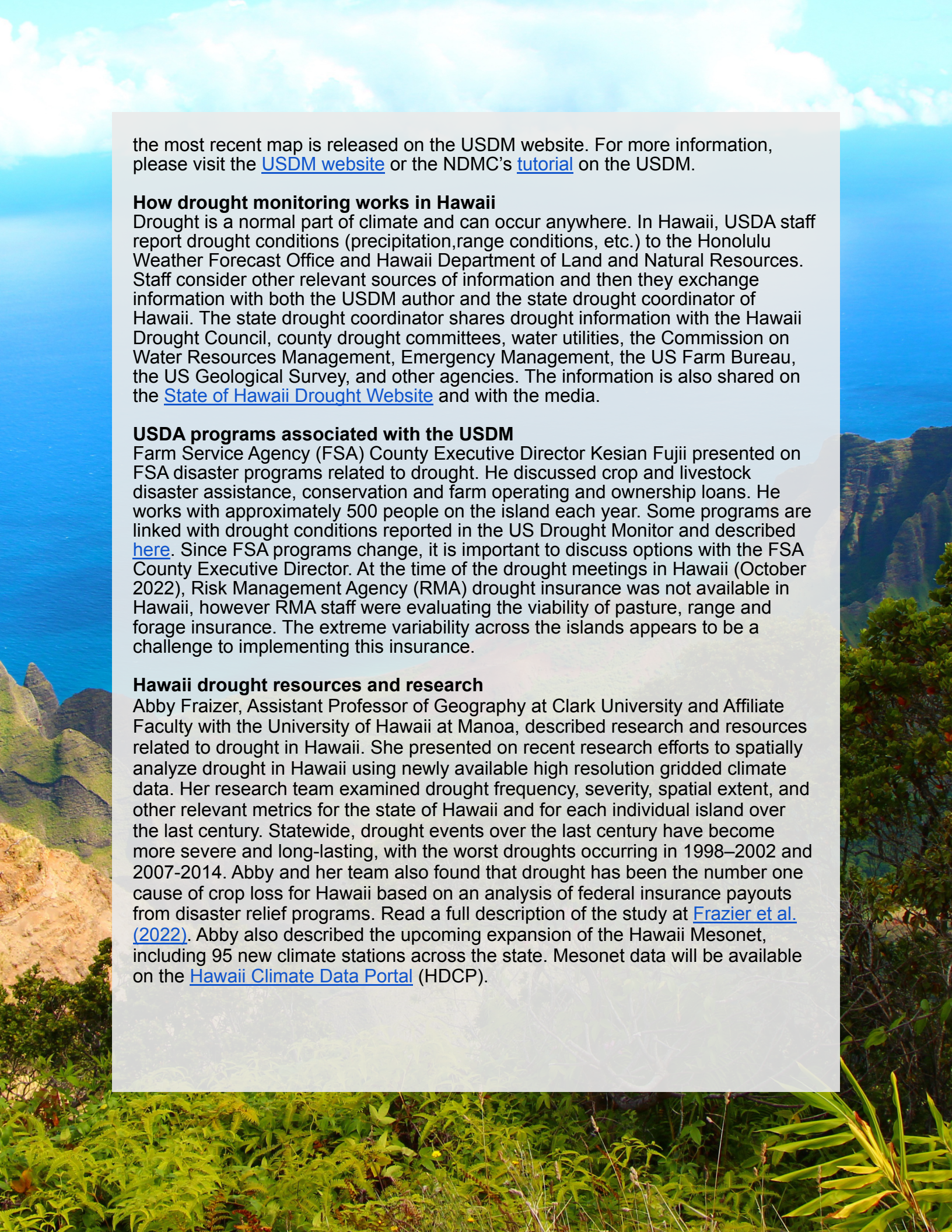
## Drought Monitoring and Response in Hawaii Hilo - October 7, 2022

Representatives from the National Drought Mitigation Center (NDMC), the USDA Southwest Climate Hub, East-West Center, Clark University and the Institute of Pacific Islands Forestry hosted a series of drought workshops in October 2022 on four Hawaiian Islands. The final meeting was hosted at the USDA Forest Service Institute of Pacific Islands Forestry in Hilo, Hawaii. Participants represented a variety of agricultural and natural resource management agencies including federal organizations (USDA Farm Service Agency and Forest Service, Pacific Islands Climate Adaptation Science Center), Akaka Foundation for Tropical Forests, Hawaii Fire Department, Three Mountain Alliance, US Pacific Basin Agricultural Research Center, University of Hawaii, Mauna Kea Watershed Alliance and other organizations. Prior to the meeting, participants noted what they hoped to gain from the meeting including:

- A better understanding of what goes into the drought monitor
- Networking and building relationships
- Building community around drought resilience and proactive management strategies in Hawaii
- Learning about collaborations and technology that support drought monitoring
- Learning how to prepare for future droughts
- Greater understanding of current Pacific Drought Knowledge Exchange, monitoring tools, and resources
- Obtaining information and resources for helping the communities understand drought and connecting how it is affecting our fire cycles.
- Contributing information to the USDM
- Expanding knowledge of drought related resources for natural resource management
- More information about climate change and water access
- Understanding of drought trends and patterns for Hawaii

### **United States Drought Monitor production and process**

Brian Fuchs, climatologist and USDM author, with the National Drought Mitigation Center (NDMC) discussed how the USDM describes drought conditions by historical percentiles that are expressed in a map with different severity categories. The USDM map shows how severely dry different areas are, compared to normals for the location and time of year. The map expresses drought in four categories, each with increasing severity: moderate, severe, extreme, and exceptional drought, as well as abnormal dryness, which is used to depict areas going into or coming out of drought. The more severe drought categories indicate more unusually dry conditions and lower historical percentiles for the data being analyzed. Each week a single author analyzes physical data, such as precipitation statistics, streamflow, soil moisture, vegetation health, groundwater, and other variables. The author also considers local expert input and impact information when analyzing the physical data. Each Thursday morning



the most recent map is released on the USDM website. For more information, please visit the [USDM website](#) or the NDMC's [tutorial](#) on the USDM.

### **How drought monitoring works in Hawaii**

Drought is a normal part of climate and can occur anywhere. In Hawaii, USDA staff report drought conditions (precipitation, range conditions, etc.) to the Honolulu Weather Forecast Office and Hawaii Department of Land and Natural Resources. Staff consider other relevant sources of information and then they exchange information with both the USDM author and the state drought coordinator of Hawaii. The state drought coordinator shares drought information with the Hawaii Drought Council, county drought committees, water utilities, the Commission on Water Resources Management, Emergency Management, the US Farm Bureau, the US Geological Survey, and other agencies. The information is also shared on the [State of Hawaii Drought Website](#) and with the media.

### **USDA programs associated with the USDM**

Farm Service Agency (FSA) County Executive Director Kesian Fujii presented on FSA disaster programs related to drought. He discussed crop and livestock disaster assistance, conservation and farm operating and ownership loans. He works with approximately 500 people on the island each year. Some programs are linked with drought conditions reported in the US Drought Monitor and described [here](#). Since FSA programs change, it is important to discuss options with the FSA County Executive Director. At the time of the drought meetings in Hawaii (October 2022), Risk Management Agency (RMA) drought insurance was not available in Hawaii, however RMA staff were evaluating the viability of pasture, range and forage insurance. The extreme variability across the islands appears to be a challenge to implementing this insurance.

### **Hawaii drought resources and research**

Abby Fraizer, Assistant Professor of Geography at Clark University and Affiliate Faculty with the University of Hawaii at Manoa, described research and resources related to drought in Hawaii. She presented on recent research efforts to spatially analyze drought in Hawaii using newly available high resolution gridded climate data. Her research team examined drought frequency, severity, spatial extent, and other relevant metrics for the state of Hawaii and for each individual island over the last century. Statewide, drought events over the last century have become more severe and long-lasting, with the worst droughts occurring in 1998–2002 and 2007–2014. Abby and her team also found that drought has been the number one cause of crop loss for Hawaii based on an analysis of federal insurance payouts from disaster relief programs. Read a full description of the study at [Frazier et al. \(2022\)](#). Abby also described the upcoming expansion of the Hawaii Mesonet, including 95 new climate stations across the state. Mesonet data will be available on the [Hawaii Climate Data Portal](#) (HDCP).

## **Pacific Drought Knowledge Exchange**

Ryan Longman with the Center for Pacific Islands Studies, University of Hawaii at Manoa discussed the [Pacific Drought Knowledge Exchange](#) (PDKE). This program seeks to facilitate drought knowledge exchange and enable collaborative relationships among drought stakeholders in Hawaii and other Pacific Island nations. At the front lines of global climate change, the Pacific Islands experience a range of impacts, including not only drought, but sea level rise, flooding, climate-induced migration, and wildfire. The PDKE was created in an effort to help the region combat these impacts. The four key aspects of a knowledge exchange include 1) sector- and geography- specific climate information, 2) better and more comprehensive information, 3) improved technical assistance, and 4) a more collaborative information-transfer environment through participation in knowledge co-production. The PDKE engages with regional stakeholders (e.g. watershed partnerships, forest reserves, national parks) to document drought stories, lessons learned, and relevant research; and to produce site-specific Climate Change, Climate Variability, and Drought (CCVD) portfolios in order to co-develop usable tools and educational items.

## **Summary and next steps**

Workshop organizers ran a group activity related to main needs in the regions. Through the discussion they were able to identify recommendations from the participants. These are listed below.

- Distributing a weekly email to watershed partnerships to share drought conditions or weekly email to get drought information.
- Partnering with the Hawaii Environmental Education Alliance to share drought information.
- Establishing reliable people on a local level to monitor areas and report back.
- Talking to local communities because there is a lot of local indigenous knowledge that is not written.
- Connecting scientific data to management decisions.
- As drought severity, duration and frequency increases, investigate how this will affect climate justice, invasive species, and where or when certain management practices should be carried out.
- Launching a Hawaii based podcast focused on climate change issues.
- Assisting in organizing study groups to help people use the climate adaptation workbook online independently.

The group discussed next steps and decided that reasonable and useful next steps would include:

- In an effort to identify meeting participants interested in collaboratively working on some of the above recommendations, workshop organizers will send a follow-up message to identify who might like to join a team to work on a specific task.

- Workshop organizers will also host a short webinar to discuss taking specific action on the needs with the most interest.

Frazier, A. G., Giardina, C. P., Giambelluca, T. W., Brewington, L., Chen, Y.-L., Chu, P.-S., Berio Fortini, L., et al. (2022). *A Century of Drought in Hawai'i: Geospatial Analysis and Synthesis across Hydrological, Ecological, and Socioeconomic Scales*. *Sustainability*, 14(19), 12023. MDPI AG. Retrieved from <http://dx.doi.org/10.3390/su141912023>

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