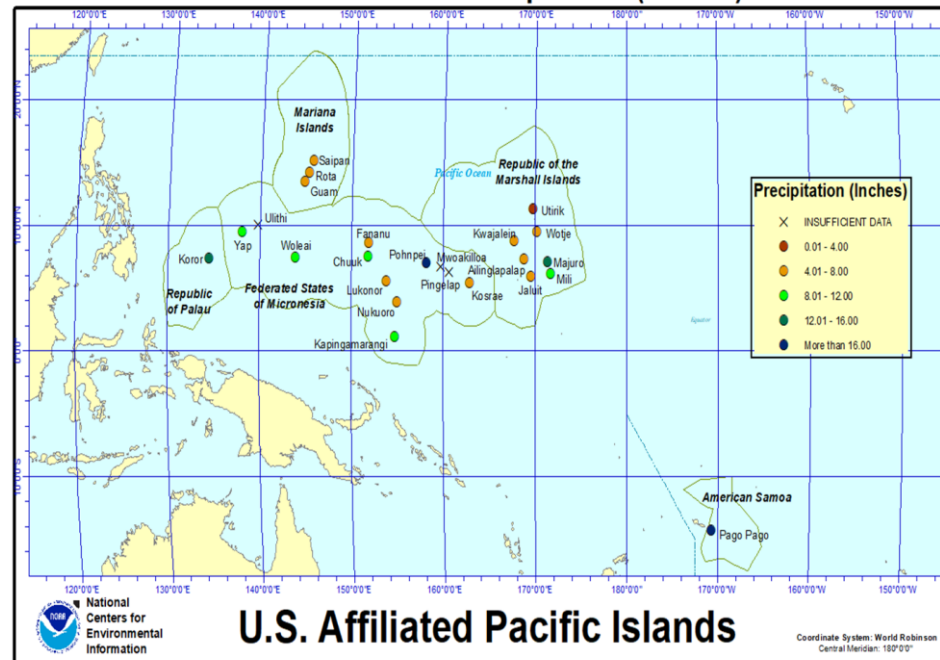# DEVELOPMENT OF MONTHLY AND SEASONAL DROUGHT OUTLOOKS FOR THE US AFFILIATED PACIFIC ISLANDS

SARA T. STREY, MIKE HALPERT, MATTHEW ROSENCRANS, LUKE HE, AND ZENG-ZHEN HU

US AFFILIATED PACIFIC ISLANDS PRECIPITATION

- USAPI largely dependent on rain for all freshwater needs

- Unique geomorphology

- Sensitive to salt water intrusion due to sea level increases on storm, tidal, and seasonal timescales (climate change notwithstanding)
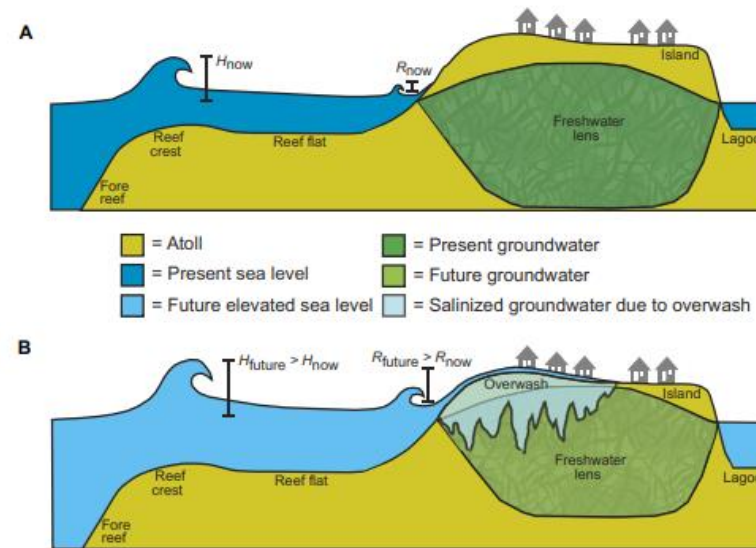

SCIENCE ADVANCES | RESEARCH ARTICLE

Fig. 1. Conceptual diagram of the influence of SLR on wave heights, wave-driven runup, and flooding and the resulting impact on atoll island groundwater. (**A**) Current sea level. (**B**) Future elevated sea level. SLR will allow for greater wave heights, H, and wave-driven runup, R, than at present, resulting in frequent overwash that will contaminate the atoll island's freshwater lens. High vertical exaggeration in schematic.
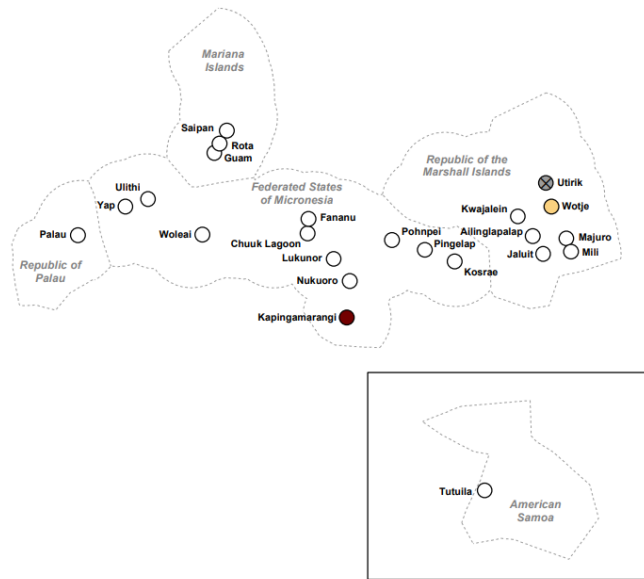
(Storlazzi et al 2018
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5916506/pdf/aap9741.pdf)

Photo by Majuro Water & Sewer Company

CURRENT PRODUCT: US DROUGHT MONITOR

U.S. Drought Monitor
U.S. Affiliated Pacific Islands

**October 13, 2020**
(Released Thursday, Oct. 15, 2020)
Valid 8 a.m. EDT

Intensity:
- No Data
- No Drought or Dryness
- D0 - Abnormally Dry
- D1 - Moderate Drought
- D2 - Severe Drought
- D3 - Extreme Drought
- D4 - Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to https://droughtmonitor.unl.edu/About.aspx

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NCEI/NOAA

droughtmonitor.unl.edu

- Drought thresholds are largely determined by predetermined water supply needs

  - 2 in/week or 8 in/month

  - Except for American Samoa and Guam which need 1 in/week or 4 in/month

- Challenges:

  - Sparse data network

  - Large amounts of historical data missing for many of the islands

CFSV2 SKILL OVER USAPI

Monthly Mean Precipitation CFSv2 Skill (28 Members; Jan1982~Dec2018)
Lead=0 Month
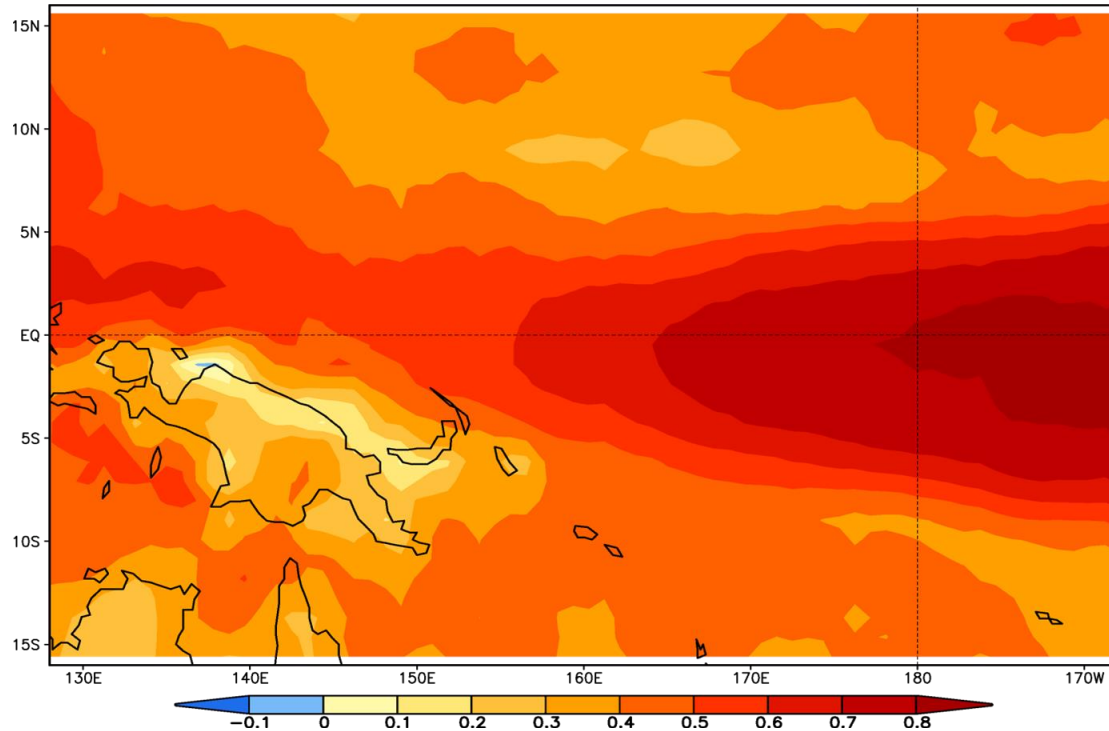
- CFSv2 prediction skills are relatively low in the USAPI. That is consistent with correlation patterns of the precipitation with ENSO indices.

- Challenges:

  - Model resolution low for given stations.

  - E.G. Yap's area is only 38.61 mi² (~100 km²)

FUTURE WORK

- Since model skill isn't perfect, data are sparse, and precipitation forecasts are vital for community water management, the monthly and seasonal drought outlook requires efforts that vary drastically from CONUS outlooks.

- To overcome the unique challenges:

    - Verify NMME historical forecasts using GHCN data

    - Perform downscaling of NMME precipitation to island levels