"Vegetative Guide Dashboard": Relating traditional atoll agroforestry recommendations to predicted climate and sea level conditions in the Marshall Islands

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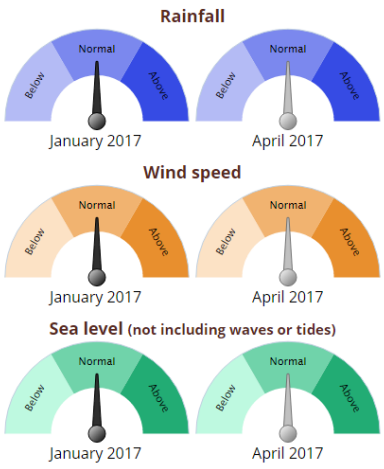
An example of a Marshallese agroforest, with breadfruit, papaya, and coconut. Image courtesy of Maria Haws.

Many people dream of life on tropical islands, and the Marshall Islands are a prime example. Sadly, climate change threatens the low-lying islands' very existence as sea level rises, with some communities already routinely inundated by saltwater from high tides and storm surges. At the same time, local culture and food traditions are being eroded as the population increasingly becomes urbanized and dependent on imported food. This has a negative effect on the nutrition, health and welfare of residents since the foods imported are often high in fat and sugar and low in nutrients and fiber. Luckily, the Marshallese have a long tradition of agroforestry that is still active, especially on the more rural islands. Food-producing trees such as coconuts, breadfruit, and pandanus are interplanted with bananas and root and vegetable crops. This variety of plantings can help increase the resiliency of local food production systems. Salt-tolerant plants including coconut, pandanus and inedible shrubs serve as windbreaks and stabilize shorelines to mitigate storm damage. However, long-term changes in climate will necessitate alteration to planting and harvest schedules and techniques, and species of crop plants grown. More information about current and future growing parameters can help growers to choose appropriate systems for their area for both short and long-term yields.

We have created a living website that provides clear, actionable farming information displayed in a dashboard format. Users can look quickly to find information in English and Marshallese about relevant factors such as rainfall, winds, and sea level at seasonal time scales as well as agricultural calendars based on El Niño/ La Niña. Modern science provides a valuable service with today's ability to predict droughts that typically follow El Niño years. The website also provides critical information for growers such as traditional growing practices and timings, best available information about crop tolerances of environmental factors, and nutritional information.



Part of the website dashboard showing seasonal information.

This living website creates an opportunity for Marshallese partners to add or refine in order to provide a clearinghouse of information and increase interest in traditional foods and agricultural practices. Translation to Marshallese is underway and translated pages can be downloaded, printed and distributed by local agricultural extension services**.**

Quick Summary

- Traditional Marshallese agroforesty provides a good model for diverse and resilient crop production and is adapted to natural variation due to El Niño and La Niña. However, long-term climate change in the Republic of the Marshall Islands is causing agricultural conditions to shift outside the typical range of variability so growing practices will need to be altered.
- Our website provides easy access to well-researched, localized information at a variety of timescales to assist with both short and long term agroforestry planning so that traditional agriculture practices can be integrated with new information on plant varieties and planting/harvest schedules. The website is currently found at http://oos.soest.hawaii.edu/pacific-rcc/Marshalls%20Agroforestry/site/.
- The project was implemented by Marshallese partners at the Ministry of Resources and Development, College of the Marshall Islands, and Land Grant program, and external partners from the University of Hawai'i, National Oceanic and Atmospheric Administration, US Department of Agriculture Forest Service and Natural Resources Conservation Service. Future transfer of the website to an agency in the Marshall Islands is intended to enable further improvements, especially responding to Marshallese interest and experience.

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Contact Maria Haws (haws@hawaii.edu) or Kathleen Friday (kfriday@fs.fed.us) for more information on this project. To learn more about climate science at PI-CSC, contact David Helweg (dhelweg@usgs.gov) or visit: https://nccwsc.usgs.gov/pacificislandscsc.