



## Western Pacific Regional Fishery Management Council

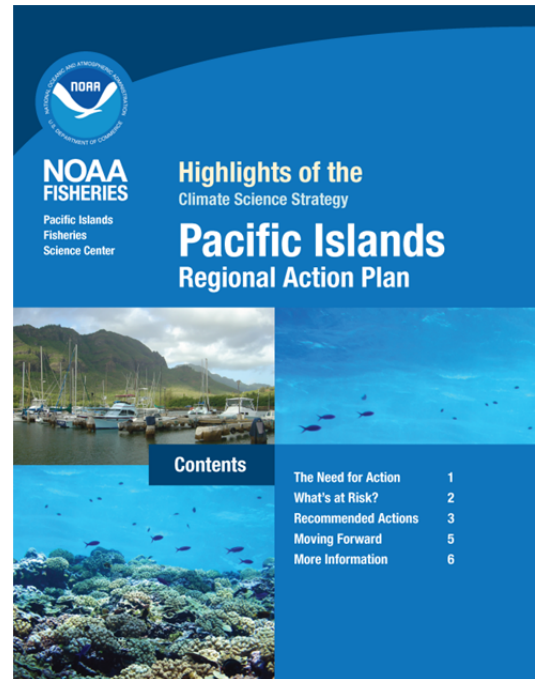
### Shifting Stocks and Changing Ocean Conditions

The Western Pacific Council's area of responsibility spans both the North and South Pacific, including the federal waters of Hawai'i, American Samoa, Guam, the Commonwealth of the Northern Mariana Islands and the U.S. Pacific Remote Island Areas.

The Pacific Islands Region supports a wide variety of ecologically and economically important species and habitats from coral reefs to pelagic fish stocks. Climate-related changes in the region include a rise in ocean temperatures, reduced nutrients in the euphotic zone, an increase in ocean acidity, a rise in sea level and changes in ocean currents. Many of these changes have already been observed and are projected to increase further. These changes will directly and indirectly impact insular and pelagic ecosystems and the communities that depend upon them. Decision-makers need actionable information on how changing climate will impact this region's marine resources and what can be done to reduce impacts and increase resilience.

The NOAA Pacific Islands Fisheries Science Center and the Council partnered to develop the Pacific Islands Regional Action Plan that identifies priority needs and specific actions to implement the NOAA Fisheries Climate Science Strategy in the region. The Strategy identifies seven key objectives:

1. Identify climate-informed reference points
2. Create robust management strategies for a changing climate
3. Incorporate adaptive decision processes
4. Project future conditions
5. Understand how things are changing and why
6. Track changes and provide early warnings
7. Build our science infrastructure



How does the science advice given to fisheries managers take into account changing ocean conditions and potential movement of fishery resources? In 2019, the Council explored ways to identify the impact of regional oceanographic conditions' (linked to global climate variability) on the recruitment of uku (blue-green snapper, *Aprion virescens*). The Council used Hawai'i Division of Aquatic Resources fishery data to determine that a local eastward current likely serves as a way to retain fish in the area that otherwise may be pushed westward along large ocean currents. Currently, this is the only population dynamic process in local fisheries linked to measurable oceanic or climate processes that can predict local abundance in future years.

A recent modeling study by NOAA and others investigated the effects of climate change on Hawai'i's most economically important commercial fishery for bigeye tuna (ahi, *Thunnus obesus*). It warns of a possible decline in fishery performance due to climate change.

The Council takes this and other information into account to:

- ✓ Make domestic management decisions
- ✓ Recommend international measures to sustainably manage fisheries
- ✓ Improve future access to fishery resources for Pacific Island communities
- ✓ Ensure food security
- ✓ Support ecosystem resilience

How do managers deal with changing ocean conditions?

The Council participates in workshops hosted by NOAA to address climate change and the vulnerability of Pacific Islands, in particular. The goal of these assessment workshops is to prioritize research needs and indicate how managers may respond to changing climate conditions. The Council leads a process to set annual catch limits for fisheries based on overfishing risks and uncertainty in the information about the fishery status. The process could also incorporate climate uncertainty in determining how conservative or adaptive catch limits should be. Climate information is also monitored through the ecosystem consideration section of the Council's Annual Stock Assessment and Fishery Evaluation Reports.

In 2020, the Council organized an international area-based management workshop to address many fishery-related objectives, including reducing climate change impacts on fishery resources in the open ocean. The workshop discussed emerging issues in national waters and in areas beyond national jurisdiction and called for clarity in objectives, monitoring and area-based selection. It also stressed comparing static versus dynamic area-based approaches. Workshop participants produced a "Roadmap to Effective Area-Based Management of Blue Water Fisheries" ([www.wpcouncil.org/Blue-Water-ABMT-workshop](http://www.wpcouncil.org/Blue-Water-ABMT-workshop)).