PAPAHĀNAUMOKUĀKEA
Marine National Monument

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Four new algae species discovered in Hawaii's deep waters

(Honolulu, HI) – Scientists working with NOAA's Office of National Marine Sanctuaries announced the discovery of four new species of deep-water algae from Hawai'i. Marine algae, or limu, are very important in Hawaiian culture, used in foods, ceremonies and as adornments in traditional hula. The new species of limu were collected between 200-400 feet, depths not typically known for marine algae.

Heather Spalding, Ph.D., postdoctoral researcher at the University of Hawai'i Department of Botany and lead author of the study, said, "I was astounded at the abundance and size of these algae, which resembled something you would see in a shallow-water lagoon, not at 400 feet."

Spalding has been collaborating with NOAA's Office of National Marine Sanctuaries for several years studying samples collected by NOAA divers working in Papahānaumokuākea Marine National Monument. She and her colleagues at the University of Hawai'i and University of Washington's Friday Harbor Laboratories conducted DNA analyses that showed that the species are very different than those found in Hawaii's shallow waters, even though they are very similar in appearance.

"If you picked up one of these algae on the beach, you couldn't tell if it was from a nearby rock or washed up from the deep, the species look that similar," Spalding said.

The newly discovered species are similar in appearance to limu pālahalaha (*Ulva lactuca)*, or sea lettuce. Scientists consulted with the Native Hawaiian community to develop meaningful names for the new species to honor the great importance they have in Hawaiian culture. One species was named *Ulva iliohaha*, which refers to the foraging behavior of 'Īlioholoikauaua, the endangered Hawaiian monk seal, one of the best-known residents of Papahānaumokuākea.

The species were sampled during surveys between 2013 and 2015 in Papahānaumokuākea Marine National Monument by NOAA divers using advanced SCUBA diving technologies, and during past NOAA expeditions from 2006 to 2014 throughout the Main Hawaiian Islands using submersibles operated by the Hawai'i Undersea Research Laboratory. Scientists anticipate that many additional new species of algae will be described in the coming years from samples collected by NOAA divers on future expeditions to the Monument.

"These findings redefine our understanding of algal distributions in Hawai'i, and hint at the great number of other new species that are likely to be discovered in the future from these amazing deep-water reefs," said Daniel Wagner, Papahānaumokuākea research specialist with NOAA's Office of National Marine Sanctuaries.

The study describing the new species of limu was published in the latest issue of the *Journal of Phycology*. The article, titled "New Ulvaceae (Ulvophyceae, Chlorophyta) from mesophotic ecosystems across the Hawaiian Archipelago," is featured as the journal's cover story and can be accessed in its entirety at http://onlinelibrary.wiley.com/doi/10.1111/jpy.12375/full.

Images are available at https://www.flickr.com/gp/papahanaumokuakea/h48GK7.

Papahānaumokuākea is cooperatively managed to ensure ecological integrity and achieve strong, long-term protection and perpetuation of Northwestern Hawaiian Island ecosystems, Native Hawaiian culture, and heritage resources for current and future generations. Three co-trustees - the Department of Commerce, Department of the Interior, and State of Hawai'i - joined by the Office of Hawaiian Affairs, protect this special place. Papahānaumokuākea Marine National Monument was inscribed as the first mixed (natural and cultural) UNESCO World Heritage Site in the United States in July 2010. For more information, please visit www.papahanaumokuakea.gov.