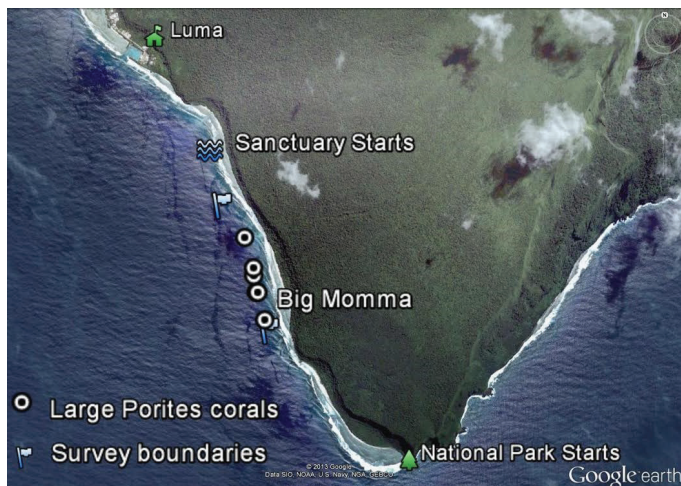


TA'U MANAGEMENT UNIT: RESEARCH UPDATE

VALLEY OF THE GIANTS: A REEF OF ANCIENTS



The Valley of the Giants is a region of reef along the South West coast of Ta'u island that contains numerous giant boulder corals, among the largest in the world. These corals are protected within the Ta'u management unit of the National Marine Sanctuary of American Samoa.

PORITES CORALS

These giant corals belong to the genus *Porites*. *Porites* are massive, reef-building corals that vary greatly in size and shape depending on their environment. In calm water areas they can grow into large helmet-shaped mounds. Although the Ta'u giants have not been properly identified by a taxonomist, they are most likely the species *Porites lobata* (known by the common name lobe coral). This type of coral grows very slowly, sometimes as little as 1cm (0.39in) per year. This means that large colonies are among the oldest life forms on earth.



Valley of the Giants: A diver near a couple of large *Porites* coral heads.
(Photo Credit: Dr. Wendy Cover)

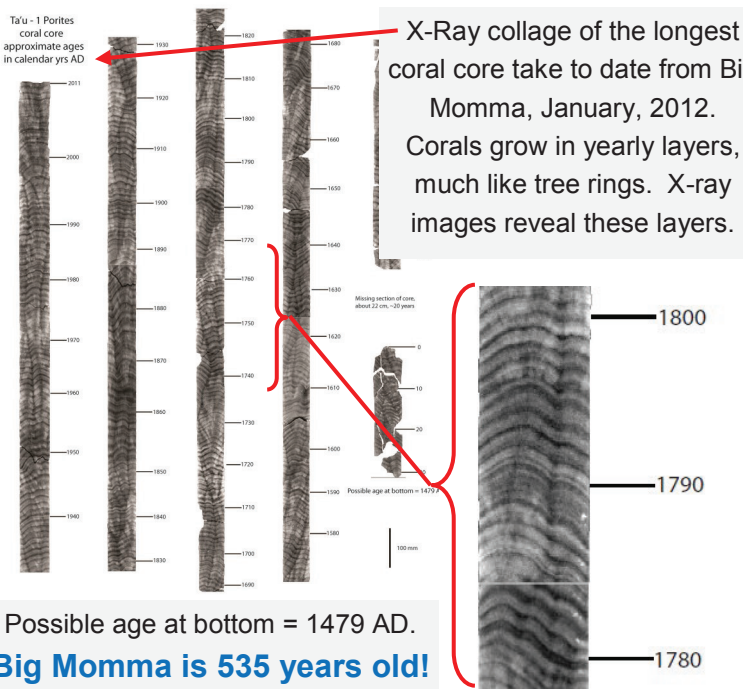
BIG MOMMA

Big Momma is the largest coral in the Valley of the Giants and may be the largest in the world. In February 2014, scientists with the sanctuary measured her **circumference at 41m (135ft)**, making her **average width 13m (42ft)!** She stands **6.4m (21ft) high**, from 14m (46ft) to 7.6m (25ft) depth.



Big Momma coral head off of Ta'u.
(Photo Credits: Wendy Cover)

RESEARCH

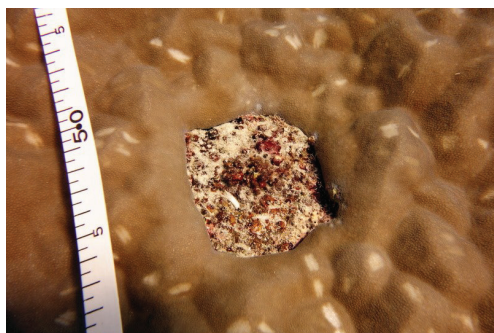


In 2012, scientists from Stanford University, under the leadership of Dr. Rob Dunbar, took three long core samples from Big Momma. The best core, shown to the left, is the longest coral core taken anywhere in the world to date. It shows that Big Momma started growing around 1479 AD and enjoyed regular growth since then. The scientists take minute samples from each layer, from which over 3500 stable isotope analyses have been completed that are giving an exceptional view of climatic conditions at Ta'u over Big Momma's lifetime. Dr. Dunbar and his team closed off the holes from coring with cement plugs. Mysteriously, two of these plugs came out shortly after, but were replugged a couple of months later by NOAA's Coral Reef Ecosystem Division. In February, 2014, researchers from the sanctuary checked on the plugs. They were in place with healthy tissue growing over the area.

STATUS OF BIG MOMMA

In general, Big Momma is a healthy *Porites* coral in an area with good water quality. There is a large growth anomaly on her south facing side, and a large fissure on her east facing side with other corals growing in it. Her north side has a large overhang that provides shelter for many fish. The major threats to Big Momma include warming ocean temperatures and acidification, which bring the risk of coral bleaching and skeletal degradation. Disease and crown-of-thorns starfish predation are also potential concerns.

In February, 2014, sanctuary researchers conducted video transects across the cardinal points of Big Momma to document her state and have a baseline for comparison in the future. They also conducted towboard surveys to check for crown-of-thorns starfish (COTS) and look for other reef threats (see map). No COTS or major disease events were found, although there were numerous bleached mushroom corals on the first survey. Sanctuary researchers mapped eight giant corals, and there is much more area to explore.



Cement plug over the coring hole, with healthy coral tissue growing back over the plug.
(Photo Credit: Dr. Wendy Cover)



NMSAS scientists measuring Big Momma.
(Photo Credits: Rob Roberts-Center, Dr. Wendy Cover-Right)