

## **Papahānaumokuākea Marine National Monument Permit Application Cover Sheet**

This Permit Application Cover Sheet is intended to provide summary information and status to the public on permit applications for activities proposed to be conducted in the Papahānaumokuākea Marine National Monument. While a permit application has been received, it has not been fully reviewed nor approved by the Monument Management Board to date. The Monument permit process also ensures that all environmental reviews are conducted prior to the issuance of a Monument permit.

### **Summary Information**

**Applicant Name:** Gregory C. Johnson (on behalf of U.S. Argo)

**Affiliation:** NOAA/Pacific Marine Environmental Laboratory

**Permit Category:** Conservation and Management

**Proposed Activity Dates:** ongoing

**Proposed Method of Entry (Vessel/Plane):** TBD

**Proposed Locations:** Floats to be deployed in gaps of Argo array coverage in water deeper than 2000m. Argo floats will be deployed from ships already entering the Monument for permitted activities. The specific ships and track lines are not available at this time as permitting for primary activities from vessels has not occurred.

Deployments from NOAA vessels (such as the Hiʻialakai or Oscar Sette) or UNOLS research vessels (such as the Kilo Moana) are anticipated.

**Estimated number of individuals (including Applicant) to be covered under this permit:**

Deployments would occur from vessels already permitted for work within the Monument by personnel already working on those vessels. Actual float deployments typical use two people to maneuver the float on deck and lower the float into the water.

**Estimated number of days in the Monument:** No additional personnel days, instruments will remain in Monument unless currents carry them out.

**Description of proposed activities:** (complete these sentences):

a.) The proposed activity would...  
deploy autonomous profiling CTD instruments as part of the Argo project. These instruments would report temperature, salinity profiles along with drift (current) information every 10 days. Data would be available freely worldwide within 24 hours of collection.

b.) To accomplish this activity we would ....  
locate vessels permitted for activity within the Monument and request that they deploy floats along their routes in areas of low coverage that are deeper than 2000m. When such opportunities are found, we would train personnel in deployment procedures.

c.) This activity would help the Monument by ... providing temperature, salinity and current data for the ocean from the surface to 2000-m depth within the Monument. Because Argo data are available freely and in near-real time, they can be quite useful, even vital, for accurate monitoring and forecasting of conditions. Argo floats can be used to assess conditions in the euphotic zone, including mixed layer depths, temperatures, and salinities as well as the strength of the thermocline. Knowing the temperature, salinity, and current structure can help managers monitor conditions within the Monument and thus better manage activities.

**Other information or background:**

The Argo project is an international effort to measure the temperature, salinity, and currents in the upper 2000m of the ocean globally. Autonomous floats at 3 degree latitude/longitude spacing are utilized for this purpose. These floats are typically deployed by a line from vessels moving slowly (at 1-3 knots). Floats adjust their buoyancy, allowing them to sink or rise at a rate of about 8cm/s when profiling. The standard Argo mission using iridium communications is to drift for 10 days at 1000m, descend to 2000m, then ascend to the surface collecting temperature and salinity data. The floats then spend approximately 15 minutes on the surface to obtain a position fix and return data. Data are available freely within 24 hours of collection. Floats have a target lifetime of 4 years, but advances in the design mean that floats covered by this permit should return data for 6 or more years. When floats run out of energy (which typically occurs at 2000m where the highest energy load demands occurs) they will remain at depth until corrosion breaches their hulls and sends them to the bottom. Please see [www.argo.net](http://www.argo.net) for more information about the project.

Floats covered under this application will be approximately 65 inches long, 5.5 inches in diameter (with a 9.5 inch diameter stability disk), and weigh about 45 lbs. They are powered with lithium batteries and use iridium communications.

This application seeks to obtain a permit to deploy floats into the Monument as deployment opportunities arise and as holes in the Argo array open. This permit does not specify locations or a ship as we seek to utilize vessels permitted for other work in the Monument. A recent cruise by the NOAA ship Oscar Sette would have provided an excellent chance to deploy 6 floats, however until the Sette obtained its permit for its primary mission, they could not know their cruise track and we could not know if they were crossing gaps in the array in water deeper than 2000m.

Argo data has proven its worth for a variety of operational purposes (see [http://www.argo.ucsd.edu/Use\\_by\\_Operational.html](http://www.argo.ucsd.edu/Use_by_Operational.html)). Ensuring that there is not a hole in data within the Monument seems likely to have substantial value for the conservation of the Monument