

**OCEAN SURVEY EXPERIMENT**  
*Pattern and Module Descriptions*

**Investigator(s):** Jun Zhang, Nick Shay (Co-PIs), Rick Lumpkin (NOAA/AOML/Physical Oceanography Division [PhOD]), George Halliwell (NOAA/PhOD), Elizabeth Sanabia (USNA), and Benjamin Jaimes (U. Miami/RSMAS) (Co-Is)

**Requirements:** Categories 1-5

**SCIENCE OBJECTIVE #1:** *Obtain observations on TC-ocean interaction to improve flux parameterizations and to test coupled TC models [TC-Ocean Interaction]*

**P-3 Pattern #1: Ocean Survey (Pre-storm)**

**What to Target:** Region before storm passage based NHC's best track

**When to Target:** 48 hours prior to forecast arrival of the TC over the operating area

**Pattern:** Lawnmower, as in Fig. OC-1

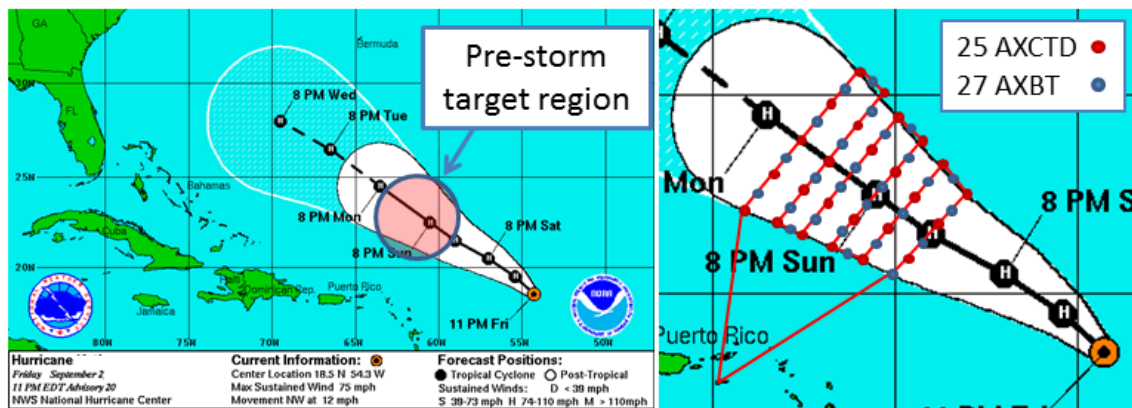
**Flight altitude:** 6–8 kft preferable

**Leg length or radii:** 105 n mi

**Estimated in-pattern flight duration:** ~ 5 h

**Expendable distribution:** 50–60 aircraft ocean expendables (AXBTs/AXCTDs) spaced approximately 0.5 deg. apart. AXCP probes may be included if significant gradients (and thus currents) are expected to be observed.

**Instrumentation Notes:** Use straight flight legs as safety permits



**Figure OC-1:** Left: NHC official forecast track, which pre-storm ocean sampling region highlighted. Target region is centered ~48 hours prior to forecast arrival of storm. Right: P-3 flight track (red line) and ocean sampling pattern consisting of a grid of AXCTD/AXBT probes. Probes are deployed at ~0.5 deg. intervals.

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**P-3 Pattern #2: Ocean Survey (In-storm)**

**What to Target:** Sample the *core region* of a TC

**When to Target:** No constraint

**Pattern:** Standard Rotated Figure-4, as in Fig. OC-2

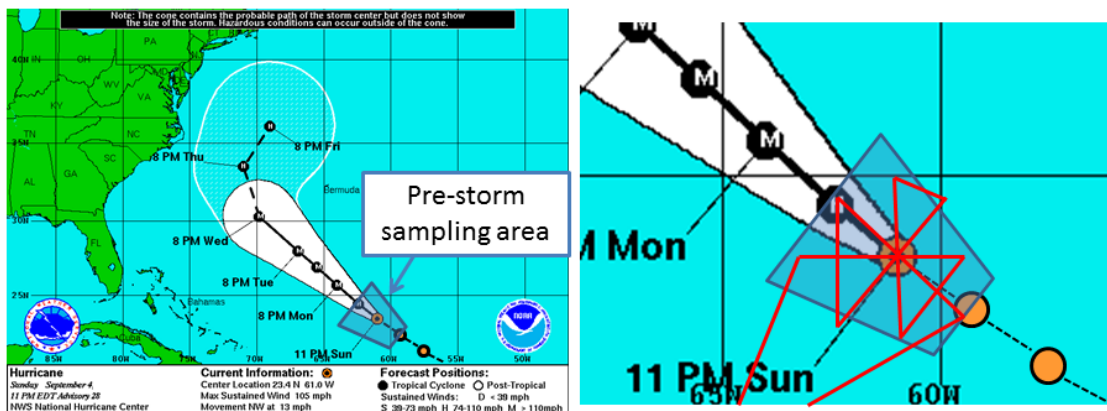
**Flight altitude:** 10 kft preferable

**Leg length or radii:** 105 n mi

**Estimated in-pattern flight duration:** ~ 5 h

**Expendable distribution:** 20–30 AXBTs in combination with dropwindsondes

**Instrumentation Notes:** Use straight flight legs as safety permits. Preferably flown with the WSRA.



**Figure OC-2:** Left: NHC official forecast track at time of in-storm mission, with pre-storm sampled region highlighted. Right: P-3 in-storm flight pattern centered on storm and over previously sampled ocean area. Typical pattern is expected to be a Rotated Fig-4.

**P-3 Pattern #3: Ocean Survey (Post-storm)**

**What to Target:** Sample the same *pre-storm region*, with slight pattern adjustments made based on the known storm track

**When to Target:** Post storm

**Pattern:** Lawnmower, as in Fig. OC-3

**Flight altitude:** 8 kft preferable

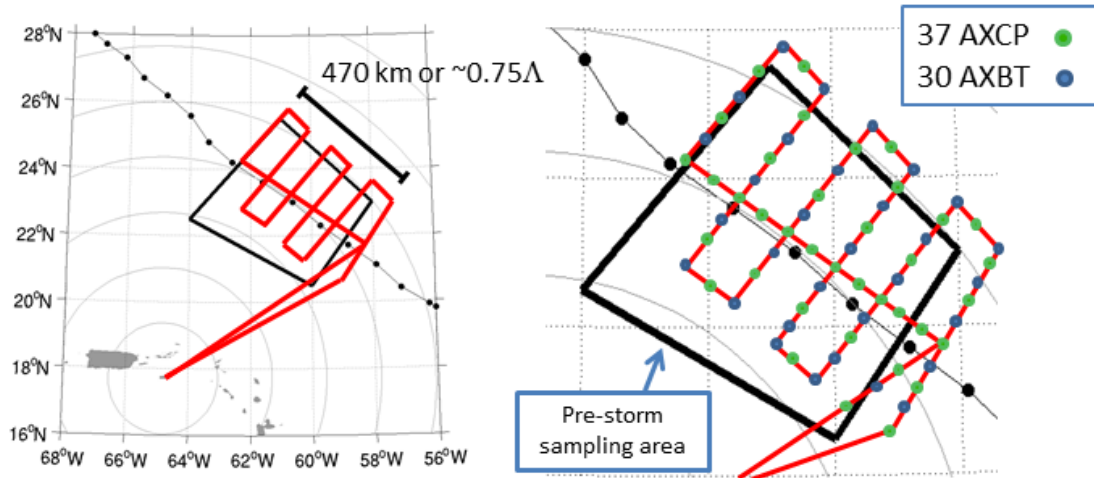
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**Leg length or radii:** 105 n mi

**Estimated in-pattern flight duration:** ~ 5 h

**Expendable distribution:** 60–70 aircraft ocean expendables (AXBTs/AXCPs)

**Instrumentation Notes:** None



**Figure OC-3:** Left: Post-storm ocean sampling flight pattern (red line), over previously sampled area (black box). In this example, the pattern extends around 470 km in the along-track dimension, or around 0.75 of a near-inertial wavelength. Right: Flight pattern with expendable drop locations, consisting of a combination of AXCP and AXBT probes.

**P-3 Pattern #4: Ocean Survey (Loop Current, Pre- and Post-storm)**

**What to Target:** Sample the loop current and associated eddy field (Gulf of Mexico warm eddy)

**When to Target:** Pre- (1–3 days prior to storm passage over the loop current) and post-storm (over same area as pre-storm survey, 1–3 days after storm passage)

**Pattern:** As in Fig. OC-4

**Flight altitude:** 6–8 kft preferable (launched via free-fall chute)

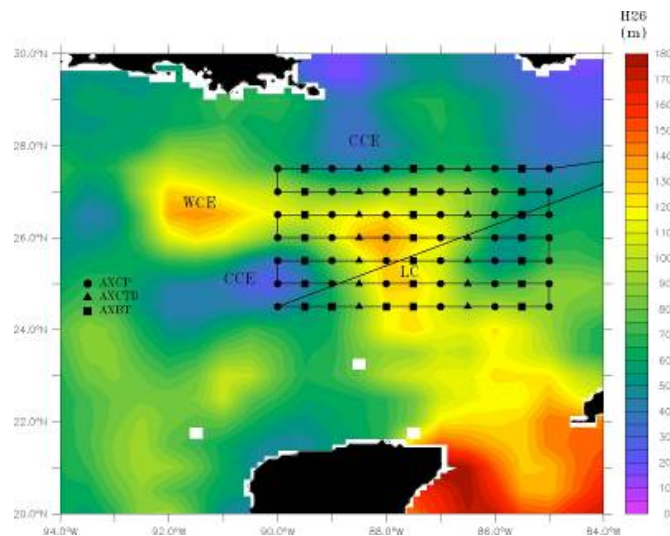
**Leg length or radii:** 250 n mi

**Estimated in-pattern flight duration:** ~ 8 h

**Expendable distribution:** a total of 60–80 aircraft ocean expendables (AXBTs, AXCPs, and AXCTDs)

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**Instrumentation Notes:** Use straight flight legs as safety permits



**Figure OC-4:** Typical pre- or post-storm pattern with ocean expendable deployment locations relative to the Loop Current. Specific patterns will be adjusted based on actual and forecasted storm tracks and Loop Current locations. Missions generally are expected to originate and terminate at AOC.

**P-3 Pattern #5: Ocean Survey (Loop Current, In-storm)**

**What to Target:** Sample the *core region* of a TC and loop current eddy field

**When to Target:** In storm, no constraint

**Pattern:** Standard Rotated Figure-4, as in Fig. OC-2

**Flight altitude:** 8–10 kft

**Leg length or radii:** 105 n mi

**Estimated in-pattern flight duration:** ~ 4 h 45 min for Figure-4 + Rotated Figure-4 (45 n mi legs)

**Expendable distribution:** A total of 40 aircraft ocean expendables (AXBTs, AXCPs, and AXCTDs).

**Instrumentation Notes:** Use straight flight legs as safety permits.

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**P-3 Pattern # 6: Ocean Survey (Float and Drifter)**

**What to Target:** Sample the *core region* of a TC

**When to Target:** In storm, no constraint

**Pattern:** As in Fig. OC-6

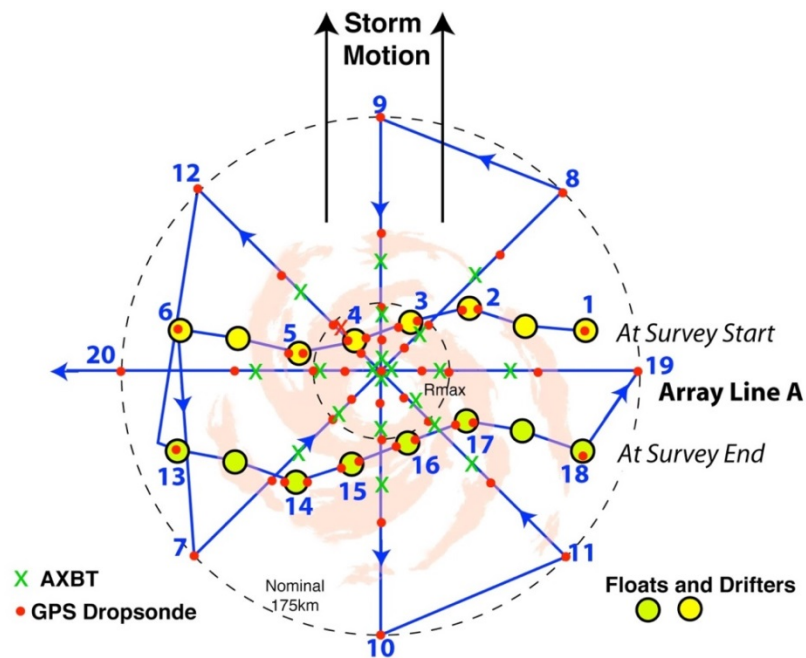
**Flight altitude:** 10–12 kft preferable

**Leg length or radii:** 105 n mi

**Estimated in-pattern flight duration:** ~ 4 h 45 min for Figure-4 + Rotated Figure-4 (45 n mi legs)

**Expendable distribution:** 56 sondes and 20 aircraft ocean expendables

**Instrumentation Notes:** Use straight flight legs as safety permits



Notes:  
 4 diameter lines through eye each with  
     9 dropsondes. At eye, 0.5 Rmax, Rmax, 2 Rmax, Line end.  
     5 AXBT. At eye, Rmax, 2 Rmax  
 2 float array lines each with  
     10 dropsondes. 2 at each of 4 floats, 2 Line ends.  
 Total: 56 dropsondes, 20 AXBT

**Figure OC-6:** P-3 pattern over float and drifter array. The array has been distorted since its deployment on the previous day and moves relative to the storm during the survey. The pattern includes two legs along the array (waypoints 1–6 and 13–18) and an 8 radial line survey.

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*Dropwindsondes are deployed along all legs, with double deployments at the floats. AXBTs are deployed in the storm core.*