

## **Upper-Ocean Variability in the Arctic's Amundsen and Nansen Basins**

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### **LONG-TERM GOALS**

The PI group seeks to observe the upper Arctic Ocean using autonomous instrumentation and build understanding of the physical processes controlling the evolving thermohaline stratification, the ocean currents and air-ice-sea interactions on time scales of minutes to seasonal and longer.

### **OBJECTIVES**

Collect and analyze exploratory observations of upper-Arctic-Ocean velocity and thermohaline stratification variations in the Eurasian sector of the Arctic. The results will constitute a comparison/contrast with previous findings from the Marginal Ice Zone DRI program that took place in the Canada Basin.

### **APPROACH**

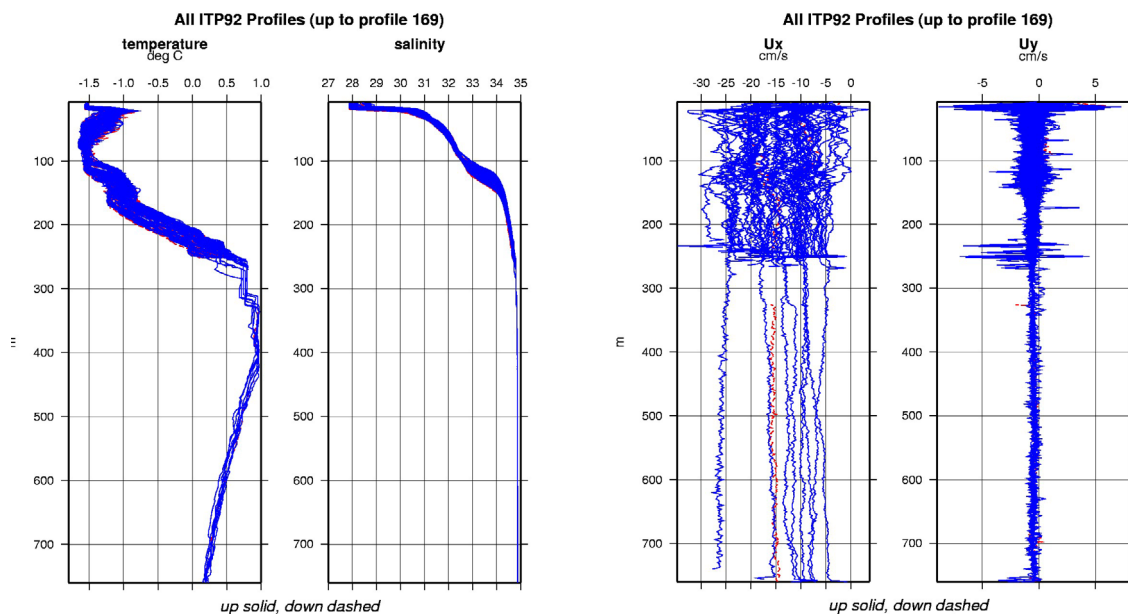
The Ice-Tethered Profiler with Velocity (ITP-V) is now an operational instrument system, as demonstrated by its successful use in the Marginal Ice Zone DRI program. One of the ITP-V instrument systems that was deployed for the MIZ study was recovered, refurbished, recertified and deployed this month from *Akademik Tryoshnikov* in conjunction with the 2015 Nansen and Amundsen Basin Observing System program (NABOS). Data from the instrument will be used to investigate ice-ocean interactions and seasonal variability of the upper ocean internal wave field, eddy variability and thermohaline stratification.

## WORK COMPLETED

As noted above, an MIZ ITP-V instrument system was recovered in fall 2014, refurbished, and recertified. That system was included in a shipment of two standard ITP instruments that were scheduled to be deployed from the 2015 NABOS cruise under funding from the National Science Foundation Arctic Observing Network program. ITP-V instrument number 92 (see [www.whoi.edu/page.do?pid=147016](http://www.whoi.edu/page.do?pid=147016)) was successfully deployed by WHOI technicians supported by the NABOS team on September 13, 2015 at 80.6765°N, 166.4581°E (together with an NPS Autonomous Ocean Flux Buoy - <http://www.oc.nps.edu/~stanton/fluxbuoy/> and two Bigelow Laboratory O-Buoys - <http://www.o-buoy.org/>). Data are just now being received; raw and automatically-processed data are available from the ITP program website. ITP92 is programmed to sample like the systems deployed for the MIZ program. Specifically, vertical temperature, salinity and velocity profiles are being collected every 3 hours in the upper 250 m of the water column with two of these one-way profiles extended to 750 m depth every other day. In addition, 20-minute time series are being collected just below the ice-ocean interface several times per day to support direct covariance flux estimates of the turbulent vertical heat, salt and momentum fluxes.

## RESULTS

Data are just now being received; we have nothing scientific to report yet. Raw temperature, salinity (left) and relative velocity profiles (right) in body coordinates (x=fore-aft, y=athwartships) from the project website are copied below.



## IMPACT/APPLICATIONS

Observations and insights deriving from ITP-V instruments are advancing understanding of ice-ocean interactions and their representation in numerical models. In turn, improved predictions and assessments of the future state of the Arctic Ocean will result.

## **TRANSITIONS**

The WHOI Ice-Tethered Profiler group is poised to support a spring 2016 ice camp to be operated by NAVOCEANO by providing one ITP system, training Navy personnel in its set up and deployment procedures, and hosting the real-time data telemetry and processing.

## **RELATED PROJECTS**

Marginal Ice Zone DRI: <http://www.apl.washington.edu/project/project.php?id=miz>

Results from this new ITP-V system will be compared with the MIZ ITP-V deployments in the Canada Basin.