

# PN07 PLUSNet - Pt Sur

Joseph Curcio, Andrew Patrikalakis, Toby Schneider, Michael Benjamin, Oleg Logutov, Heather Hornick, Andrew Shaefer, - MIT  
Don Eickstedt – NUWC, Gene Latham - ARLUT

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# Cruise Objectives

- HFGW Gateway Capability
- Remote NAFCON operation
- Autonomous Environmental Adaptive Sampling
- Alternative communications mechanisms

# Accomplishments

- HFGW radio gateway capability – Two kayaks set up with ARLUT HFGW radios. Typical deployment in station keeping mode.
- NAFCON “deploy” and “prosecute” messages allowing for remote redistribution of assets
- CTD Adaptive Sampling – CTD used to calibrate other mobile assets and provide data to the model.
- Improved communications with vehicles
- Control and monitoring of multiple vehicles using the MOOS IvP helm and new user interface

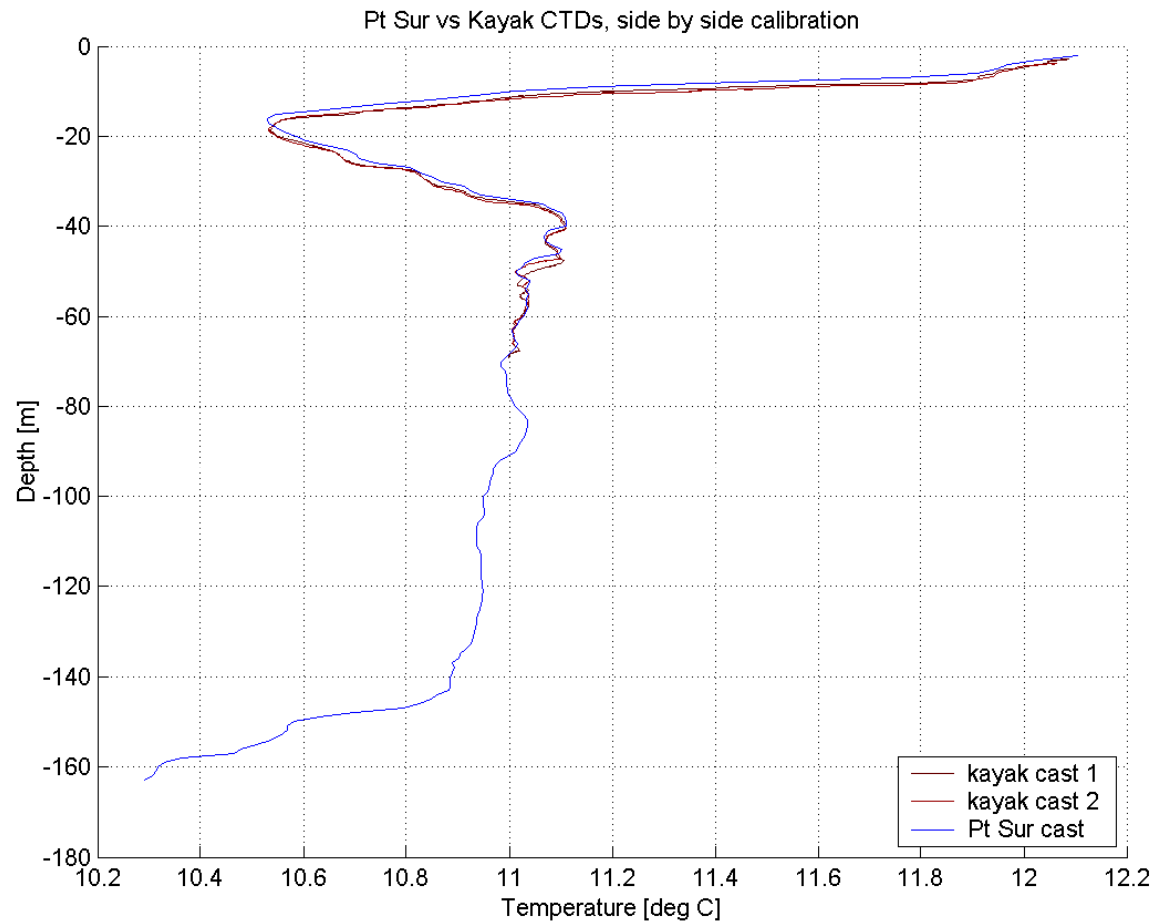
# The HFGW kayak



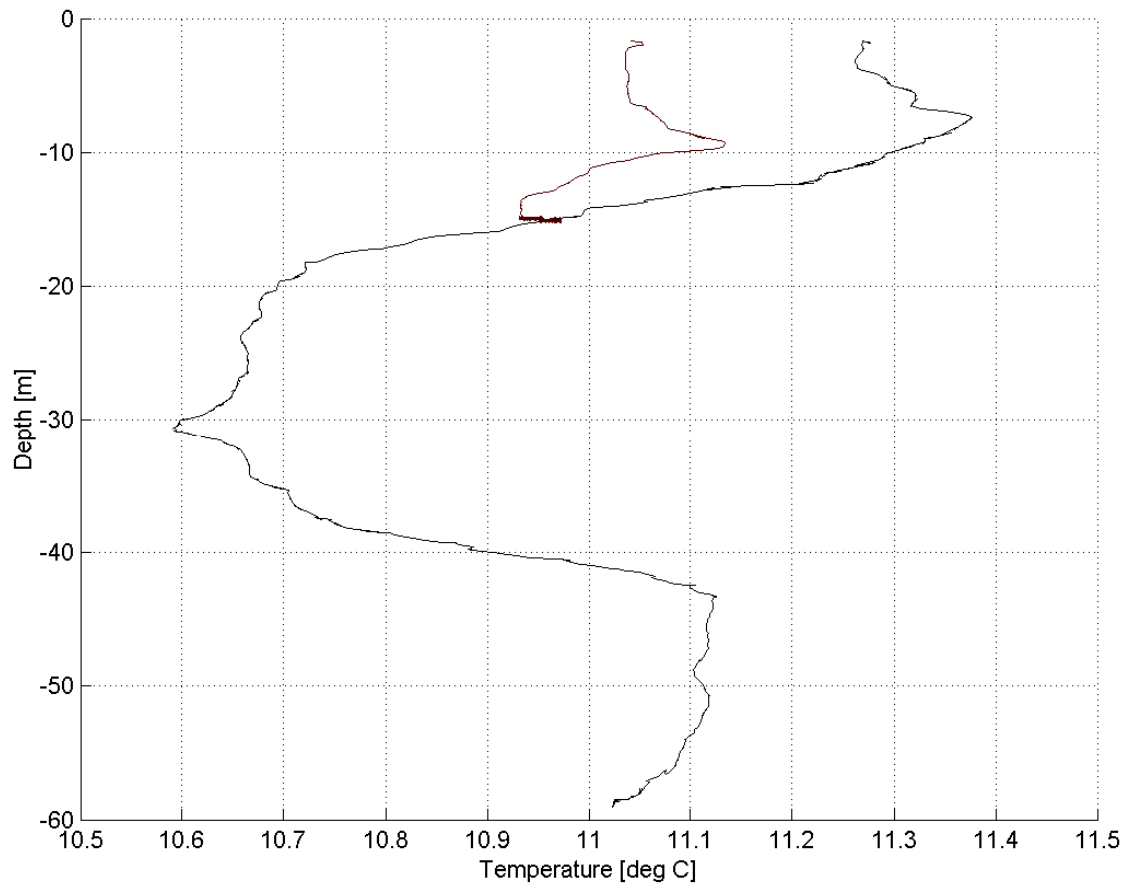
# Autonomous CTD kayak



# Kayak CTD Calibration



# Internal Wave – Pierre Lemersaux, Oleg Logutov, Heather Hornick



# Communications considerations

- 802.11 Wifi and WiLAN frequency conflicts
  - WiLAN compromised some vehicle comms
  - Shifted Wifi channels in order to improve comms
- Tested alternative to “pMOOSBridge” using UDP/IP vs. TCP/IP protocol – Andrew Patrikalakis
- Verizon EVDO Aircard
- HFGW serial interface

# NAFCON deploy and Prosecute

The screenshot displays the 'ShipSide - Viewer' application window. The main map area shows a coastal region with 'Dabob Bay' labeled. Several colored lines (red, blue, green) represent ship tracks and boundaries. A green oval highlights a specific area on the map. The interface includes a menu bar with 'File', 'BackView', 'ForeView', and 'Shipside'. On the right side, there are control panels for individual ships and 'All Vehicles'. The bottom status bar provides detailed data for the selected ship 'FRANKIE'.

Control Panel	Options
ownship	BOBBY, DEE, ELANOR, FRANKIE, (3)UNICORN, (4)MACRURA
FRANKIE	DEPLOY ON, DEPLOY OFF, STATION ON, STATION OFF, ENGAGE OK, ENGAGE OFF
All Vehicles	DEPLOY ON, DEPLOY OFF, STATION ON, STATION OFF, ENGAGE OK, ENGAGE OFF

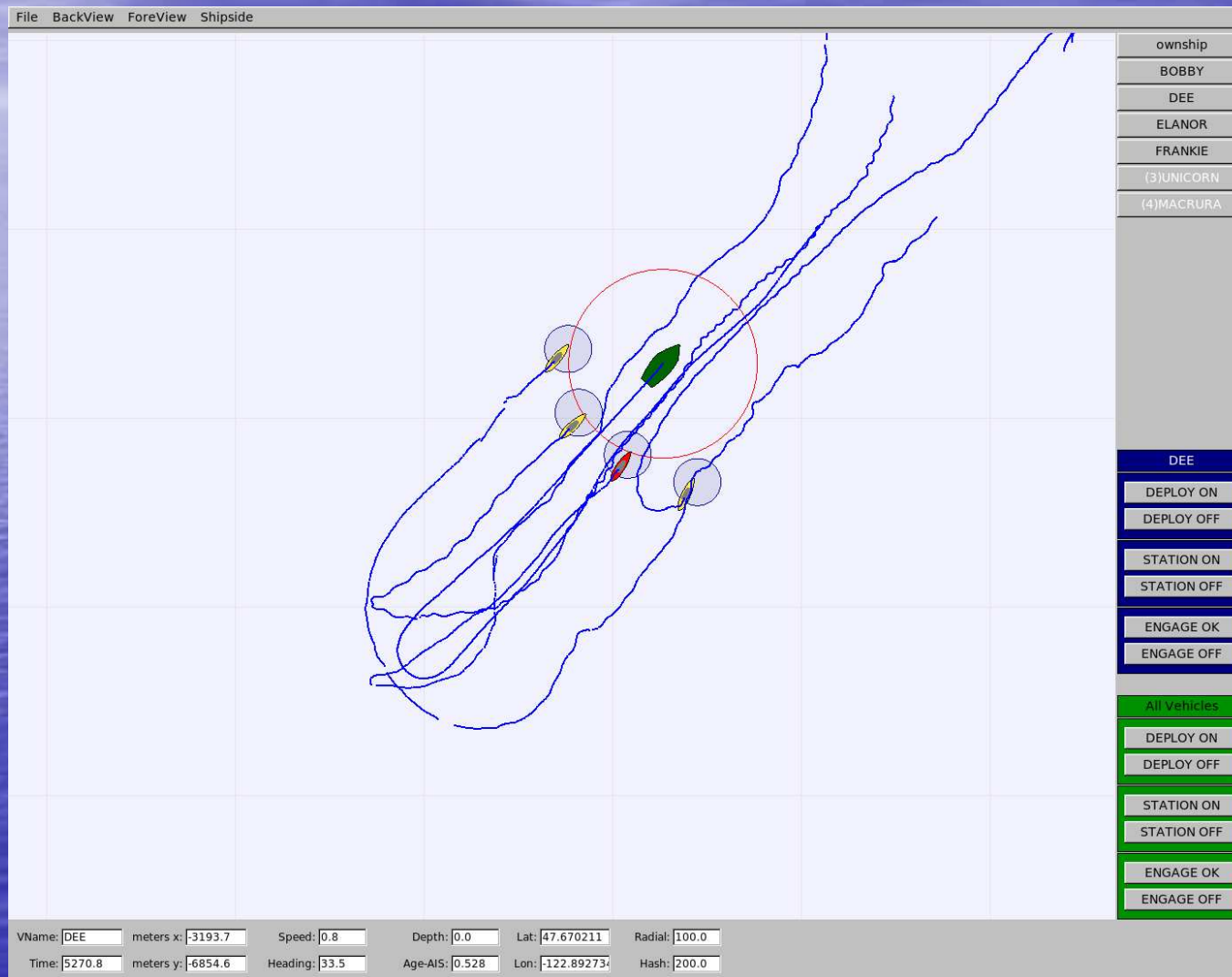
Ship Data for FRANKIE:

VName: FRANKIE	meters x: 1249.6	Speed: 10.1	Depth: 10.0	Lat: 47.736806	Radial: 100.0
Time: 16506.5	meters y: 1545.1	Heading: 1150.1	Age-AIS: 10.000	Lon: 122.84666	Hash: 1500.0

Taskbar: [Terminal] [Terminal] [pShipsi...] [ShipSide...] [uXMS as...] [uTermCo...] [Terminal] [Terminal] 1:30 PM

# Multiple Vehicle command and control with MOOS IvP Helm and GUI – Mike Benjamin

File BackView ForeView Shipside



The GUI displays a 2D map with a grid. A red circle highlights a central area containing several vehicle icons (yellow, green, red, blue) and a green leaf icon. Blue lines represent vehicle tracks. The control panel on the right has a list of ownships: ownship, BOBBY, DEE, ELANOR, FRANKIE, (3)JUNICORN, and (4)MACRURA. Below this is a section for 'DEE' with buttons for DEPLOY ON/OFF, STATION ON/OFF, and ENGAGE OK/OFF. There is also a section for 'All Vehicles' with similar buttons. At the bottom, a status bar shows various parameters for the selected vehicle (DEE): VName: DEE, meters x: -3193.7, Speed: 0.8, Depth: 0.0, Lat: 47.670211, Radial: 100.0, Time: 5270.8, meters y: -6854.6, Heading: 33.5, Age-AIS: 0.528, Lon: -122.89273, Hash: 200.0

ownship
BOBBY
DEE
ELANOR
FRANKIE
(3)JUNICORN
(4)MACRURA

DEE

DEPLOY ON  
DEPLOY OFF

STATION ON  
STATION OFF

ENGAGE OK  
ENGAGE OFF

All Vehicles

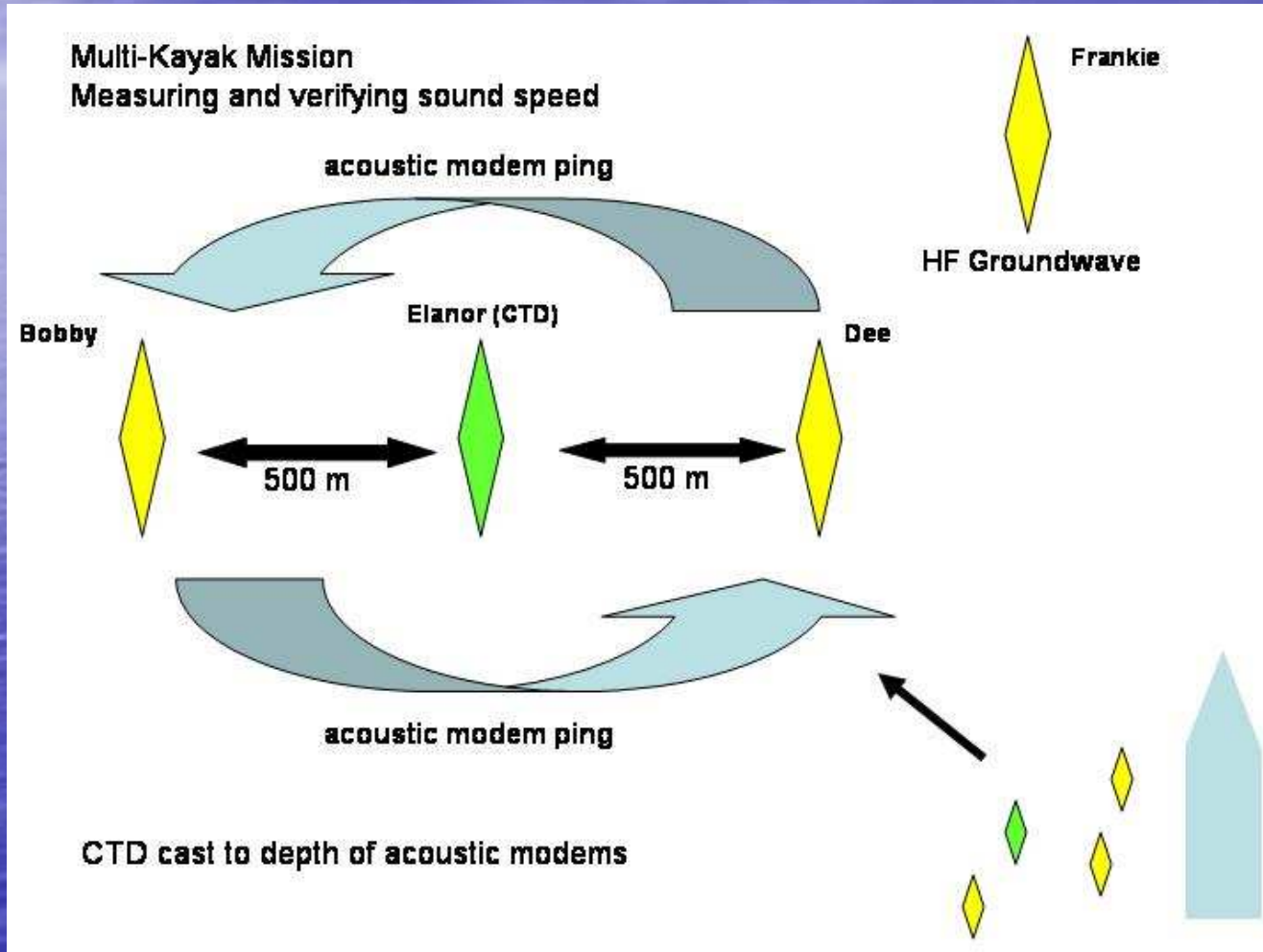
DEPLOY ON  
DEPLOY OFF

STATION ON  
STATION OFF

ENGAGE OK  
ENGAGE OFF

VName: DEE meters x: -3193.7 Speed: 0.8 Depth: 0.0 Lat: 47.670211 Radial: 100.0  
Time: 5270.8 meters y: -6854.6 Heading: 33.5 Age-AIS: 0.528 Lon: -122.89273 Hash: 200.0

# Sound Speed Profile Experiment



# Summary

- Communications issues were overcome
  - WiLAN significantly improved from MB06
  - VHF radios in labs substantially improved ops process
- CTD kayak with some MVC improvements worked very well
- Multiple vehicle operations went well
  - Ops tempo improved at end of cruise
- Vehicle loss suggests areas for improvement
  - 100% watertight enclosures
  - Improved Operating Procedures
- Data will be available on server at MIT, directory TBD