Bridging the Internet between Land and Sea

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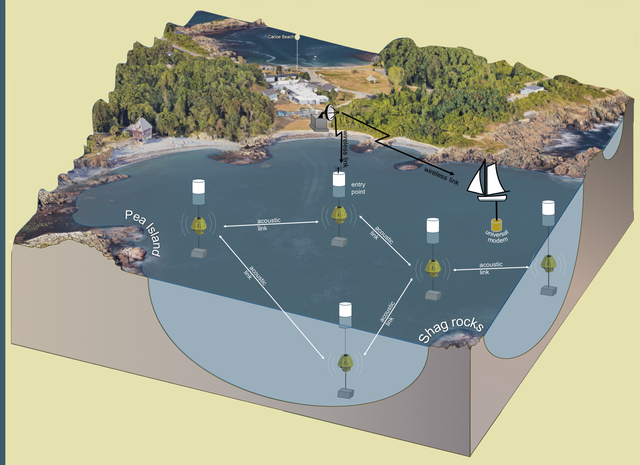
The NU MONET Project

The Northeastern University Marine Observatory Network

- A permanent underwater acoustic network used as a test-bed for future research
- Enables the experimental analysis of underwater acoustic networks across all levels of the protocol stack

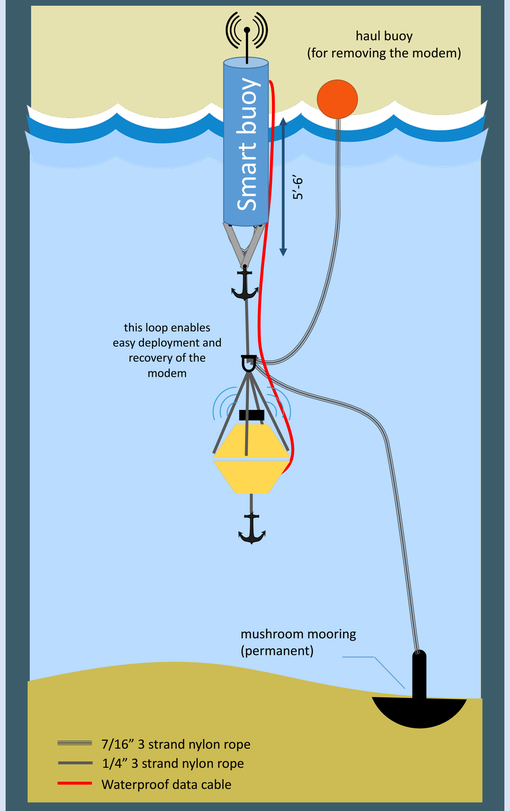


The NU MONET to be deployed at the Northeastern University Marine Science Center in Nahant, MA

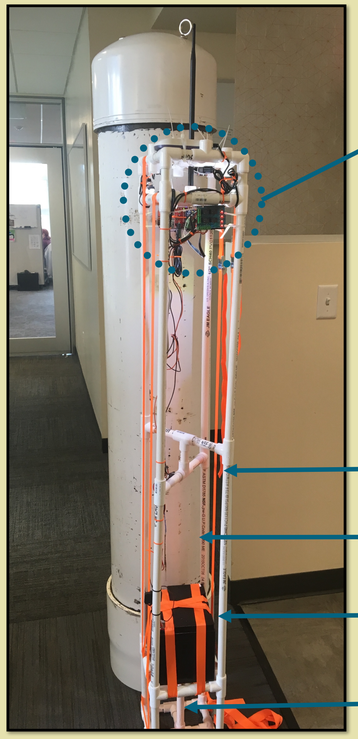
Development of Smart Buoys

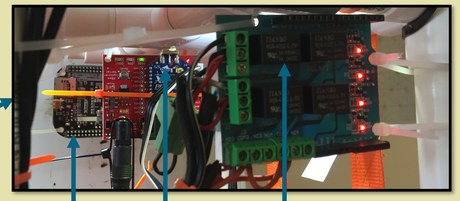
- Connect on-shore computers to underwater network
- Provide power to modems to reduce battery drain
- Current prototype cost less than $1,200

Buoy Deployment



Smart Buoy





5V Relay serves as power distribution board for buoy

Xbee serves as main communication module to shore

BeagleBone Black microcontroller runs compiled code on modems

Internal PVC frame enables easy organization and removal of equipment

12" diameter, 7.5' tall PVC shell

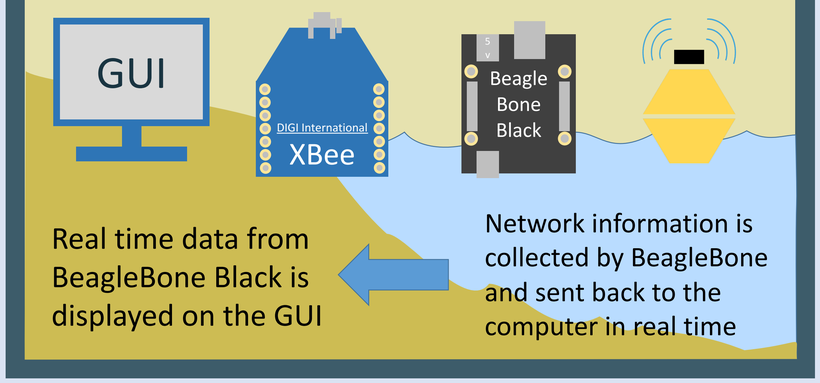
12V XXX aH Battery can power buoy and modem for up to XXX

Compartment for weights: Approximately 8 12.5lb weights will be added to compartment

Operating the Network

User compiles code and uploads over Xbee radio link

BeagleBone runs the given code on acoustic network



Real time data from BeagleBone Black is displayed on the GUI

Network information is collected by BeagleBone and sent back to the computer in real time

Future Work

- Test full deployment set up in water
- Construct smaller versions of smart buoy
- Deploy all modems to form complete network
- Test MAC protocols on full scale network
- Connect project with underwater robotics project to test wireless control of unmanned underwater vehicles

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