

Wave Glider Hot Spot

- Provide a communications gateway between shore and underwater assets
- Reduced cost
- Higher data volume

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Growing Data

- Persistent presence + multiple assets = large datasets
- Large data sources (Mb to Gb)
 - Imaging
 - Genomic
 - ADCP

Background image: video taken by Tethys LRAUV, 12/2011

Science Applications

- Patch and organism tracking, minimize surface time
- Acoustic navigation / localization
- Informed decision making (e.g. through ODSS)



Relevance to MBARI Strategic plan

“...adapt innovative technologies...”

- Exploration and discovery
- **Ocean visualization**
- **Ecosystem dynamics**
- Ocean biogeochemistry

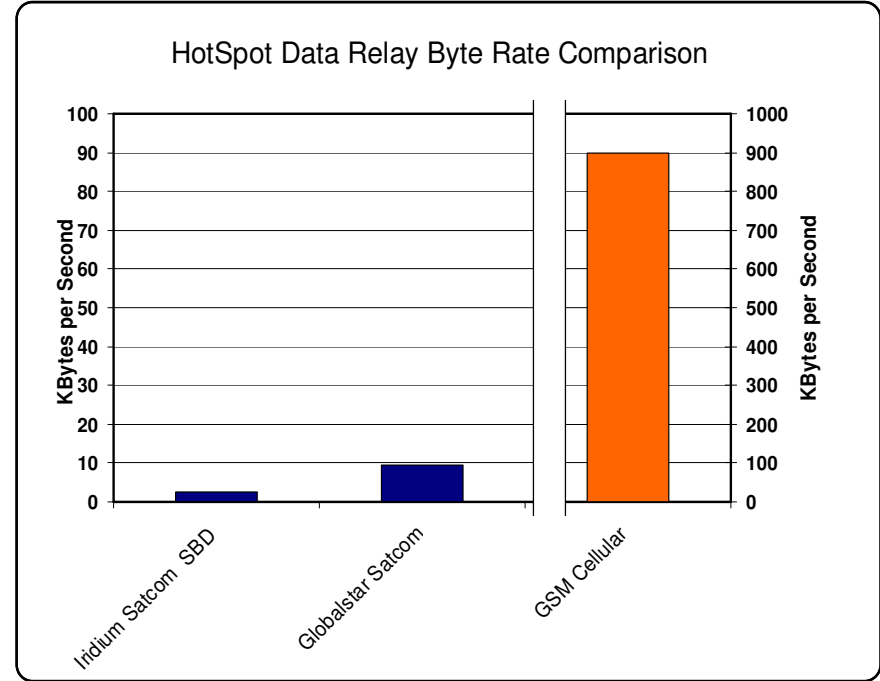
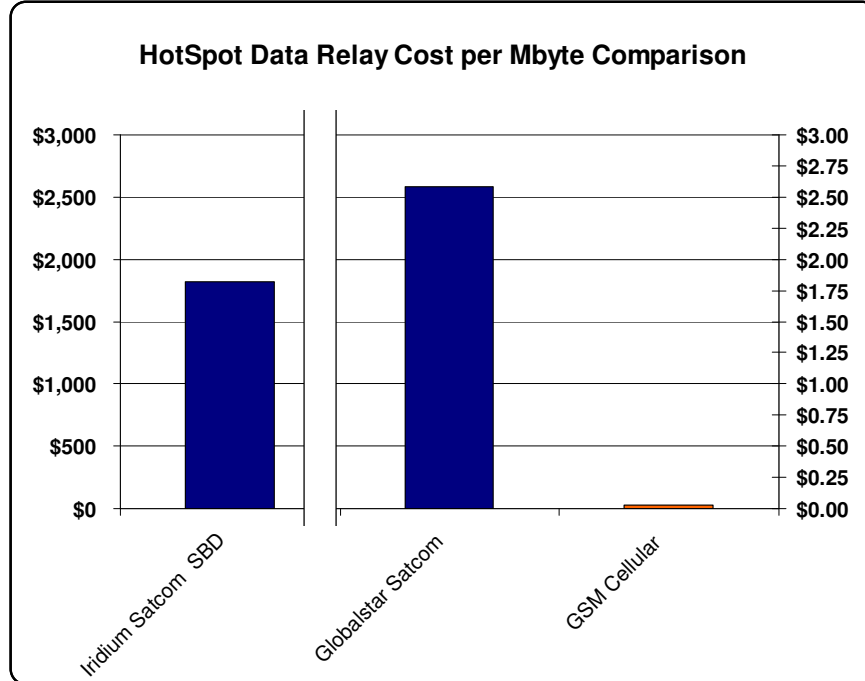
Specific Applications

Improve effectiveness and coordination of assets

- Distributed Autonomy
 - University of Porto SeaCon AUV collaboration fall CANON 2013
- CANON / LRAUV
 - LST tracking
 - LRAUVs
- Aerostat
- Benthic Event Detectors

The Costs of Data

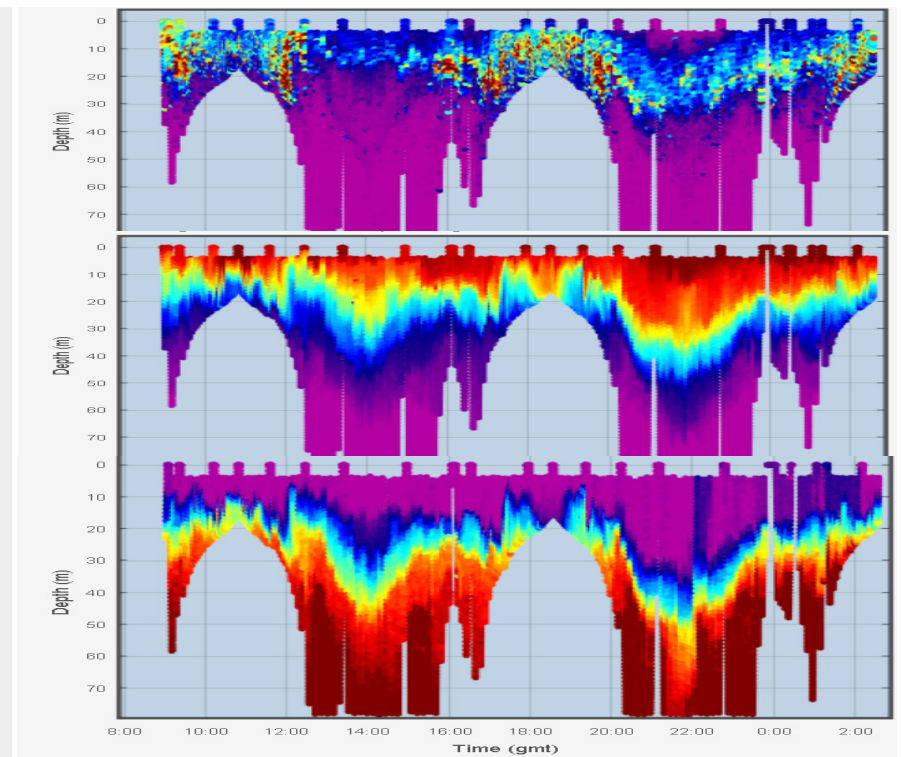
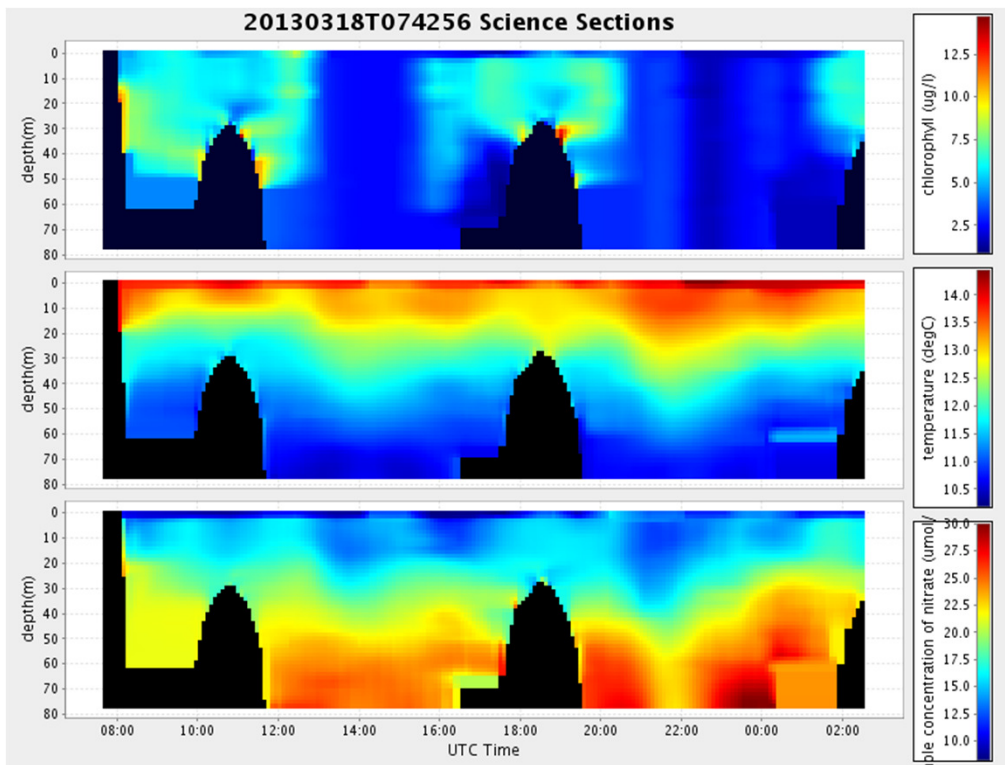
- Financial (ship time, data transfer)
 - WG: \$800/day, Ship: \$12K/day



- Opportunity cost

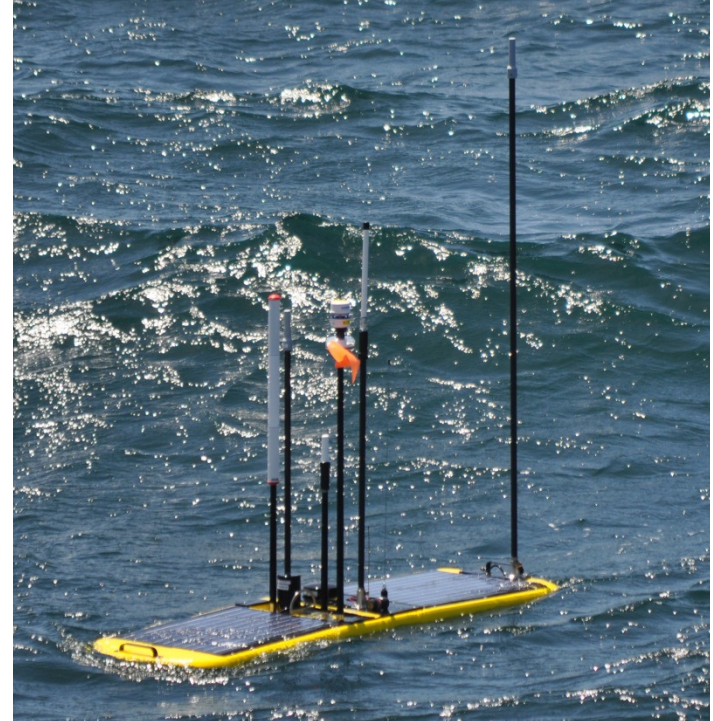
The Costs of Data

- Informed Decision Making
 - EcoHAB spring 2013: decimated versus complete data



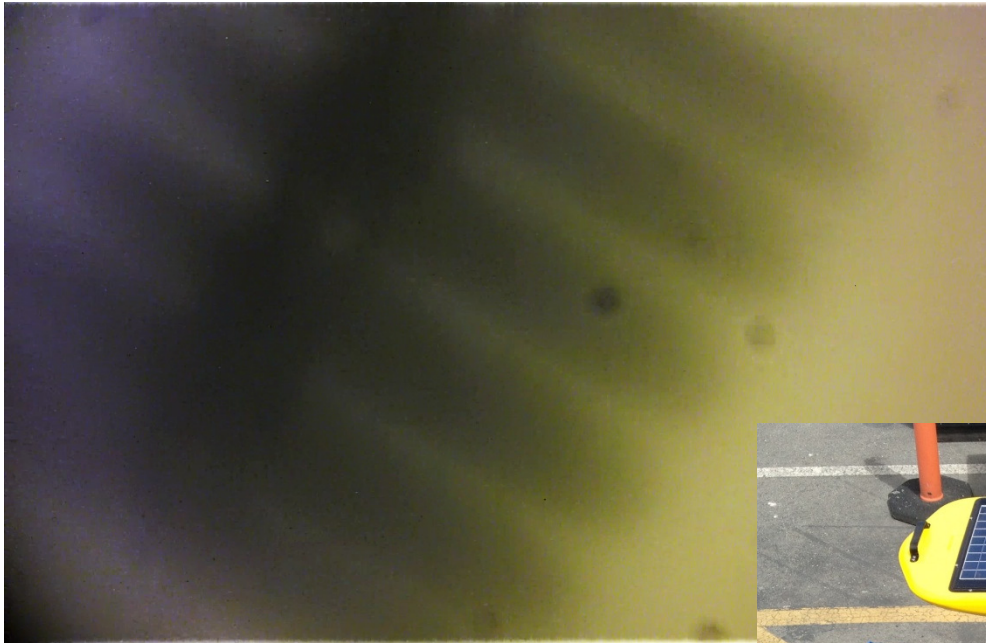
Current Work

- Radio and antenna integration
 - Freewave (2)
 - GSM Modem (Multitech 3G)
 - Cell coverage map of CANON ops area
- Dorado-WG link characterization sea trials
 - Transfer 1.34 Mbyte in less than 5 minutes
 - Max distance 450m away
 - **~ 200 times data rate of existing Iridium**



Current Work

Initial acoustic work
focused on homing to the
Wave Glider.



Modem mounted here

Daphne iUSBL used to home
to Wave Glider



Proposed Work

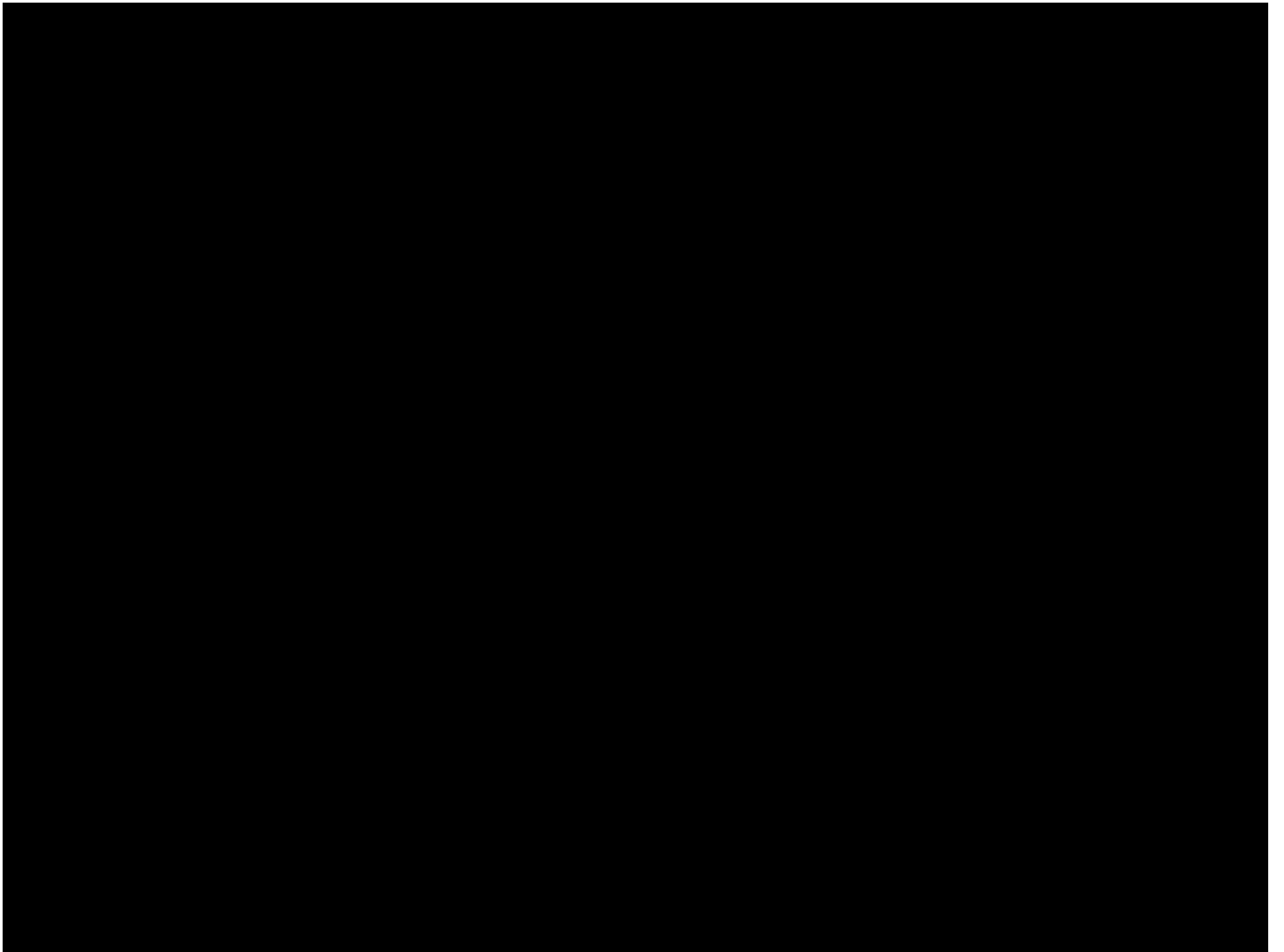
- Addition of Acoustic modem and interface
 - iUSBL add on possibility
- Add endpoints
 - Refine protocols to demonstrate use with LRAUV, LST, BEDs
- Globalstar/Iridium Integration*
- 802.11 Wifi*
- GSM Modem Integration*
- Power Management
- Aerostat data transfer demonstration
- Investigate Georgia Tech Agile Aperture Antenna
(<http://www.unmannedsystemstechnology.com/2013/06/gtri-agile-aperture-antenna-tested-on-autonomous-ocean-vehicle/>)

* Work begins 2013, in Distributed Autonomy

Equipment

- Waveglider
- Wave Glider Towbody*
- Acoustic modem (LF)*
- Acoustic modem (MF)*?
- 802.11 radio*
- Satellite modems*
- iUSBL (DAT MF)*?

* Proposing to share inventory from other programs



SV3 Benefits

- Extensible power bus
- More energy available below the float (including the towbody)
- Higher performance computing
- Parallel integration/development with LRI (i.e. better support)
- More payloads
- Back seat driver
- Propulsion
- L&R from Paragon as usual