University of Hawaii Data Acquisition System

Raising the profile of shipboard ADCP data
UHDAS Systems Installed (2021)

- Academic Research Fleet:
  - 17 UNOLS ships
  - 3 polar ships
  - NOAA: 11 (+/-)
  - “other” research ships: 6
  - (Volunteer Observing Ships: 2)

UHDAS What does it do?

- **Acquisition**: collect GPS, gyro, accurate heading, ADCPs
- **Monitoring**: daily email (UHDAS computer on ship), at-sea web site
- **Automated Processing**: at-sea web site
- **Stewardship**: improve QA, visibility
UHDAS Systems Installed (2021)

- **17 UNOLS ships**: Atlantic Explorer, Neil Armstrong, Atlantis, Blue Heron, Endeavor, Hugh Sharp, Kilo Moana, Langseth, Oceanus, Pelican, R.Revelle, Sally Ride, Savannah, Sikuliaq, R.G.Sproul, T.G.Thompson, F.G.Walton Smith

- **3 polar ships**: Healy, L.M.Gould, N.B.Palmer

- **11 (+/-) NOAA ships**: Okeanos Explorer, F.Hassler, G.Gunter, H.Bigelow, N.Foster, Pisces, R.Brown, R.Lasker, Sette, B.Shimada, Dyson

- **6 (+) “other” research ships**: Falkor, Pt Sur, Investigator, Kristine Bonnevie, Discovery, James Cook

- **2 Volunteer Observing Ships** (on hold)
Improvements in 2021

- Bridge Plot now has a “ghost ship” showing ship’s orientation
- New on UHDAS shipboard website and daily email:
  - Temperature diagnostic plot
  - GGA time diagnostics
  - New calibration number: horizontal offset between ADCP and GPS
  - Better-organized Documentation, including **Best Practices** page
  - New: daily netcdf files updated near-real-time for cruises requiring frequent data transmission to shore

**Personnel changes:**

- Joseph Gum (joined us from Scripps ODF)
- Drew Frambach joined from Colorado (storm-chasing radar) and U.Hawaii
- We’re hiring: there’s still time to **apply** (closes Nov 1)
New! Bridge Plot includes ship outline and heading

0.1 kts, 343 degT
ship heading 3 degT

Title Ocean Velocity (47-63 m)
2021/02/07 00:25:32 UTC
Electrical interference: biases at the bottom of the range

bad deep data due to electrical interference
2021: operating system upgrades

- Operating systems upgraded to 18.04 (wipe the disk, configuration per ship)
  - In person: (none)
  - otherwise: computer(s) shipped to UH, remote, build disk at UH, ship disk
    - 6 ships upgraded to 18.04
- Got UHDAS running under 20.04, updated installation scripts
- Operating systems upgraded to 20.04 (wipe the disk, configuration per ship)
  - 4 ships (8 computers) - all remote
- UHDAS code updated on existing 18.04 computers: (9 ships)

2022: operating system upgrades

- Continue to roll out Xubuntu 20.04 via these schemes:
  - you ship the UHDAS computer to us, we build, ship back
  - you install Xubuntu 20.04 (our instructions), we remote in and do the rest
  - later in 2022 we come visit!!

We will be in touch about upgrades
Problems with ARF ADCPs

- Fouled cables/connectors
  -corrosion at the transducer end: 1x ocean surveyor, 1x wh300
  -chafing on over-the-side temporary installation (2x)
- Electrical noise
  -1x deep biases, after shipyard
- Temperature warning (new plot) 2x ocean surveyor followed by failure
- Intermittent high temperature variability and loss of range (1x ocean surveyor)
- Two beams swapped, cable termination at the deck unit (1x ocean surveyor)
- low signal from one beam (requires transducer repair) 1x ocean surveyor
- low signal overall (2x ocean surveyor)
- high background noise, loss of range due to barnacles (many more in 2020)
Problems with ARF Ancillary systems

- ABXTWO - bad antenna (1x)
- Seapath “reduced quality” or “dead reckoning” (2x)
- networked data transmission
  - gaps and duplicate messages (2x)
  - UDP feed duplicated on one port, not as advertised (1x)
- Serial noise due to poor connections (1x)
  - Pelican
- Virtual Computer
  - computer time is jumpy
  - vulnerable to network problems
Coming up in 2022

- start testing Xubuntu 22.04 Summer 2022 (due out April 2022)
  - start upgrading computers to 22.04 maybe fall 2022
- Hire one more person (closes Nov 1)
- Continue documentation improvements, software development
- New instruments:
  - test Pinnacle45 (Neil Armstrong, Jan 2022)
  - further developments with the EC150 (testing 2022 Sally Ride)
- CyberSecurity impacts: UCSD forbidding automated email early 2022
- Virtual UHDAS training
Continuing Request:
Keep us in the loop regarding
(give us lots of warning)

- New ADCP (requires configuration, calibration)
- Replaced/Reinstalled ADCP (requires calibration)
- Changes in serial feeds
- Moving a GPS antenna we use, especially for processing
- New attitude devices (we like to evaluate them)
- Changes in networking
  - route to ship
  - infrastructure on ship
- Science Special Needs (triggering, temporary instrument)
The UHDAS Team

Drew Frambach
Jules Hummon
Joseph Gum
Toby Martin

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