OUTLINE

(1) ADCP+UHDAS installations
(2) Attitude (Heading) comparison
(3) RDI/RTI comment
(4) Show and Tell – cool device
(1) ADCP+UHDAS Report
RVTEC Nov 2013 – UHDAS/ADCP

Time,
ADCP
Position
Attitude

primitive data

ocean velocities
UHDAS Goals

• Acquisition: reliable, robust, duplicate feeds
• Monitoring and remote troubleshooting
• Processing
  – Balance real-time output and post-cruise recovery
  – Minimal effort to “touch up” (if all goes well)
  – Portable code and documentation
• Happy Scientists
• Happy Techs
UHDAS Installations

- **14 UNOLS ships**: Atlantic Explorer, Atlantis, Endeavor, Kilo Moana, Knorr, Langseth, Melville, New Horizon, Oceanus, Point Sur, R.Revelle, R.G.Sproul, T.G.Thompson, F.G.Walton Smith
- **3 polar ships**: Healy, L.M.Gould, N.B.Palmer
- **2 NOAA ships**: Hi`ialakai, Ron Brown
- **1 “other” ship**: Ka`imikai O Kanaloa
- **1 “cooperative” installation**: Tioga
Improvements since last RVTEC

- Code base
  - Removed use of Matlab

- UHDAS Installation
  - Upgrade to 12.04 Xubuntu (ongoing...)
  - Require: streamline multiple install methods
  - Goal: 'UHDAS' install from ISO (getting closer)

- Science Data User
  - Improve graphical editing tool
  - update documentation+virtual computer
Installations status

- All are running Python (no Matlab):
- Ships updated to Xubuntu 12.04:
  - Atlantic Explorer, Atlantis, Hi`ialakai, Healy, Kilo Moana, Knorr, KOK, L.M.Gould, N.B.Palmer, Oceanus, Ron Brown, T.Thompson, Walton Smith, Oceanus
- Ships needing this update
  - Endeavor, Langseth, Pt Sur, Melville, Revelle, Sproul, New Horizon
- New Installations:
  - Sikuliac, (Pelican, (Falkor))
Problems: Attitude (ongoing)

- Ashtech
  - some resets required; some failed completely
  - new antennas; new termination made MUCH better
- Phins are not perfect
  - (occasionally) uncalibrated; or fails
- Seapath (occasionally) needs to be reset
- Coda-f185: requires a reset when leaving port
- POSMV various status:
  - only 50% of them are solid, rest glitchy (or broken)
ADCP Problems (since 2/2013)

- Langseth: OS75 failed (unknown cause)
- Walton Smith
  - BB600 lost one beam
  - OS75 failed (WHOI loaned OS75 in time for cruise)
- Melville: OS150 repaired, but still loses data on station
- Falkor
  - WH300 failed
  - OS75 failed
- Kilo Moana:
  - WH300 (bad trace; failed in warm water)
Healy:

Most Dramatic Example of EMF Noise
Expectations for 2014

- Update more ships to Xubuntu 12.04
- 1+ new installation
  - Sikuliaz
- Work with R2R+NOAA regarding ADCP data
- Revisit Documentation
- Continue to streamline installation process
Continuing Request: Keep us in the loop regarding

- New ADCP (requires configuration, calibration)
  - Includes special needs by Science
- Changes in serial feeds
- New attitude devices (we like to evaluate them)
- Changes in networking
  - route to ship
  - infrastructure on ship
Protocol

- Always run “End Cruise” before archiving
- If rsync (regular backup)
  - **ALWAYS** use complete cruise name
(2) Attitude (Heading) Comparison
Most Open Ocean currents are quite small; under 0.2 m/s.

- Mesoscale Eddies
- Fram Strait
- Azores Current
- Benguela Current
- Near-Inertial Motion
- Open Ocean Tides
- Coastal Tides
ADCP challenge:

(1) Signal:

open ocean currents are quite small, often under 0.1-0.2 m/s

(2) Error:

1° heading error at 10kts causes 0.1 m/s error in ADCP ocean current
- error is in crosstrack direction

same size as ocean currents
Are these actual currents? or fiction (from heading error)

os75bb

0.2 m/s velocity at 31m

24°N  21°N  18°N  15°N  12°N

start

end

26.6 26.8 27.0 27.2 27.4

ADCP temperature, °C

os75bb: last time 2010/11/11 19:22:16
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$20K               $80-$120K
Comparison: various heading devices vs accurate heading device plotted: 1-2 standard deviations (as in ADCP processing)
1-2 stddev(ADCP heading correction) i.e. 5-min edited dh

More accurate

Less accurate
Most open ocean currents on these cruises were centered at 0.1 m/s.

1 deg heading error at 10 kts makes a 0.1 m/s error in ocean currents (crosstrack).
Final request

... as always:

Send your needy scientists to Jules
(3) RDI/RTI Comment

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