RVTEC Oct, 2023 - Honolulu,HI

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UHDAS

Raising the profile
of shipboard ADCP data

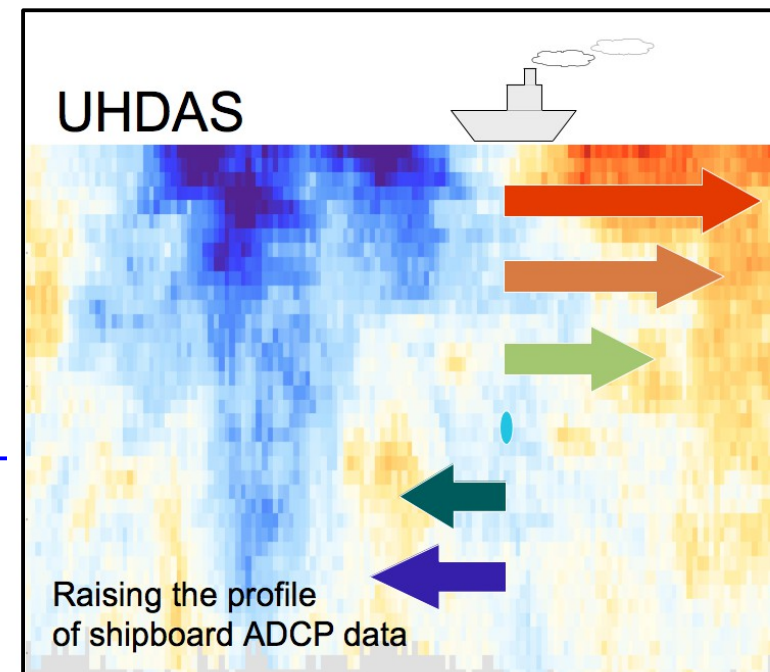## Instrument = "**ADCP**":

- **A**coustic **D**oppler **C**urrent **P**rofiler

- Use the Doppler return from 4 beams

  (+heading and position) to calculate a profile of ocean currents

Acquisition System = "**UHDAS**":

University of **H**awaii **D**ata **A**cquisition **S**ystem

UHDAS Goals:

- reliable near real-time ocean currents at sea

- long-term utility of original and processed data
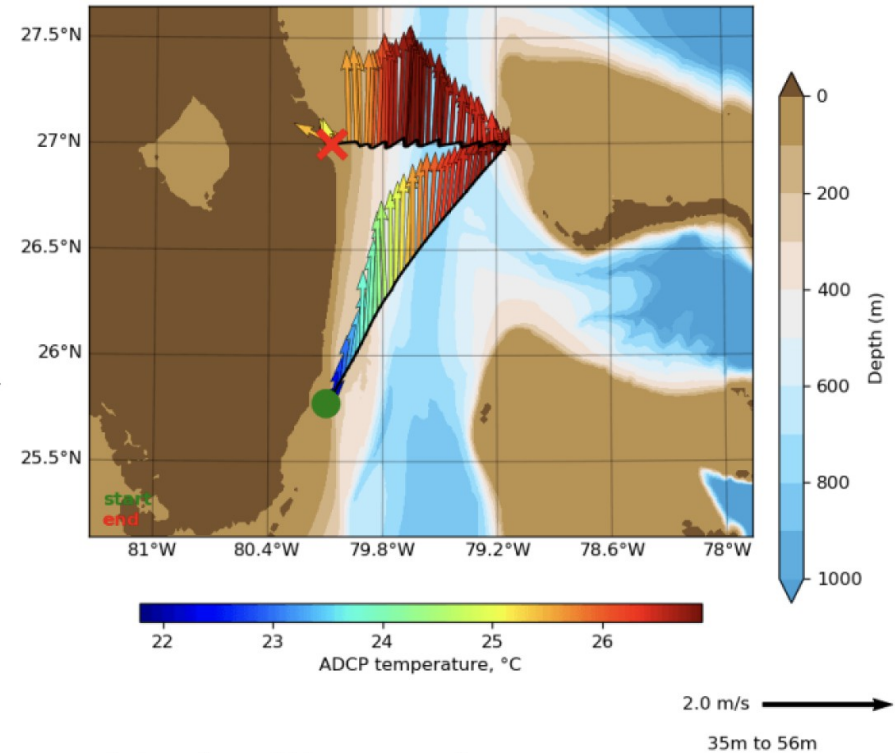
UHDAS+ADCP: What does it do?

ADCP Data ➡ Ocean Currents

ADCP single-ping data

Time

GPS position

Attitude

UHDAS+ADCP: what does it do?

- **Acquisition**: collect the data well

   - reliable, robust, duplicate feeds (ADCP, GPS, accurate heading)

- **Monitoring:** Keep it working well

   - daily scrutiny by UHDAS Team and people on shore (email)

   - at-sea web site has diagnostic plots

- **Processing:** provide access to data and plots at sea

   - Balance real-time output and post-cruise recovery

   - data access and figures in at-sea web site

   - Open Source code and documentation

- **Stewardship:**

   - improve QA, accessibility, visibility, understanding

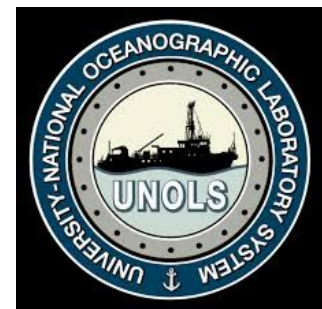   - rely on R2R and NCEI for conduit and archiving

UHDAS Systems Installed (2023)

- **17 UNOLS ships**: Atlantic Explorer, Neil Armstrong, Atlantis, Blue Heron, Endeavor, Hugh Sharp, Kilo Moana, Langseth, Pelican, R.Revelle, Sally Ride, Savannah, Sikuliaq, R.G.Sproul, Rachel Carson, 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, +T.Jefferson

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- **6** (+) **International research ships:** Falkor (too), Pt Sur, Investigator, Kristine Bonnevie, Discovery, James Cook, G.O.Sars, Johan Hjort

- **5** (+/-) **Volunteer Observing Ship (VOS)**: Oleander, Bulk Xaymaca, Norrona, RCCL Adventure of the Seas, RCCL Celebrity Flora

UNOLS ships in the UHDAS Ticketing web site

Name	Fleet	Primary	OS version	Pycurrents (UHDAS) Changeset	Last Email Update	Acquisition	Warning Level	Pending ticket(s)	Figures	Files
Atlantic Explorer	UNOLS	currents02ae	focal "Ubuntu 20.04.1 LTS"	3357 (1560)	12 hours, 26 minutes	Logging : ae2325	0 (see analysis)	4	🖼	📄
Atlantis	UNOLS	atcurrents01	focal "Ubuntu 20.04.3 LTS"	3211 (1471)	1 week, 3 days	No Cruise Set : no cruise set	0 (see analysis)	4	🖼	📄
Blue Heron	UNOLS	currents01bh	focal "Ubuntu 20.04.4 LTS"	3242 (1471)	12 hours, 26 minutes	Not Logging : bh23-23_minor	0 (see analysis)	3	🖼	📄
Endeavor	UNOLS	currents03en	focal "Ubuntu 20.04.3 LTS"	3211 (1405)	12 hours, 26 minutes	No Cruise Set : no cruise set	0 (see analysis)	2	🖼	📄
Gilbert R. Mason	UNOLS	currents01grm	22.04	None (None)	5 months, 3 weeks	No Cruise Set : None	0 (see analysis)	1	🖼	📄
Healy	UNOLS	currents01hly	focal "Ubuntu 20.04.6 LTS"	3302 (1541)	1 month, 1 week	Logging : hly2302	0 (see analysis)	8	🖼	📄
Hugh Sharp	UNOLS	currents01hs	focal "Ubuntu 20.04.5 LTS"	3252 (1494)	12 hours, 26 minutes	No Cruise Set : no cruise set	0 (see analysis)	5	🖼	📄
Kilo Moana	UNOLS	currents02km	jammy "Ubuntu 22.04.3 LTS"	3351 (1557)	12 hours, 26 minutes	Logging : km2316-post2	0 (see analysis)	4	🖼	📄
L.M.Gould	UNOLS	gentoo3	focal "Ubuntu 20.04.6 LTS"	3351 (1557)	12 hours, 26 minutes	Logging : lmg2309_part2	1 (see analysis)	4	🖼	📄
M.G. Langseth	UNOLS	currents01mgl	focal "Ubuntu 20.04.5 LTS"	3252 (1494)	12 hours, 26 minutes	No Cruise Set : no cruise set	0 (see analysis)	5	🖼	📄
N.B.Palmer	UNOLS	peale3	focal "Ubuntu 20.04.6 LTS"	3351 (1557)	12 hours, 26 minutes	No Cruise Set : no cruise set	0 (see analysis)	2	🖼	📄
Narragansett Dawn	UNOLS	currents01nd	22.04	None (None)	5 months, 3 weeks	No Cruise Set : None	0 (see analysis)	1	🖼	📄
Neil Armstrong	UNOLS	arcurrents05	jammy "Ubuntu 22.04.3 LTS"	3351 (1557)	3 hours, 39 minutes	Logging : test2023-10-20	0 (see analysis)	8	🖼	📄
Oceanus	UNOLS	vega03	focal "Ubuntu 20.04.1 LTS"	3150 (None)	1 year, 6 months	Retired : None	0 (see analysis)	2	🖼	📄
Pelican	UNOLS	currents02pe	focal "Ubuntu 20.04.5 LTS"	3252 (1494)	12 hours, 26 minutes	No Cruise Set : no cruise set	0 (see analysis)	7	🖼	📄
R.G.Sproul	UNOLS	currents01sp	focal "Ubuntu 20.04.4 LTS"	3246 (1477)	12 hours, 41 minutes	No Cruise Set : no cruise set	0 (see analysis)	6	🖼	📄
Rachel Carson	UNOLS	rigel03	focal "Ubuntu 20.04.1 LTS"	3211 (1477)	12 hours, 26 minutes	No Cruise Set : no cruise set	0 (see analysis)	7	🖼	📄
Roger Revelle	UNOLS	rr-currents	focal "Ubuntu 20.04.4 LTS"	3252 (1494)	12 hours, 41 minutes	No Cruise Set : no cruise set	0 (see analysis)	7	🖼	📄
Sally Ride	UNOLS	currents05sr	focal "Ubuntu 20.04.4 LTS"	3307 (1545)	12 hours, 26 minutes	Logging : sr2323_part2	2 (see analysis)	9	🖼	📄
Savannah	UNOLS	currents01sv	focal "Ubuntu 20.04.5 LTS"	3340 (1555)	3 weeks, 2 days	Logging : sav-23-19	0 (see analysis)	6	🖼	📄
Sikuliaq	UNOLS	currents01skq	focal "Ubuntu 20.04.5 LTS"	3257 (1494)	12 hours, 26 minutes	Not Logging : skq202313s	0 (see analysis)	10	🖼	📄
Taani	UNOLS	currents01ta	22.04	None (None)	5 months, 3 weeks	No Cruise Set : None	0 (see analysis)	2	🖼	📄
Thomas G. Thompson	UNOLS	currents04tt	focal "Ubuntu 20.04.1 LTS"	3231 (1464)	12 hours, 26 minutes	No Cruise Set : no cruise set	0 (see analysis)	5	🖼	📄
Walton Smith	UNOLS	currents01ws	focal "Ubuntu 20.04.4 LTS"	3252 (1494)	12 hours, 26 minutes	No Cruise Set : no cruise set	0 (see analysis)	0	🖼	📄

2023: UHDAS recap

Operating System upgrades:

- Complete operating system upgrade of 4 UNOLS computers on (2 ships)

- options going forward, strategy determined by

  - linux skills at operating institution,

  - partitioning scheme on the computer (some need to be redone)

- Strategies:

  1) ship the computers to Hawaii, upgrade, ship back

  2) remote install using ship's tech support

  3) remote upgrade using "do-release-upgrade"

  4) visit the ship!

Fun Facts:

  - total number of remote login "service calls" requiring a change: 174

  - number of "active data collection" UHDAS computer emails read: 6140

Instrument testing: Pinnacle45 on Armstrong

- mounting system finished late summer, 2023

- needs modification to work well with Pinnacle

- seems like Pinnacle was broken when it arrived, (going back to RDI for testing)

  Results/Conclusion: no progress on assessing Pinnacle

Personnel changes:

- gone: Toby, Joseph, Antonio left

- new hires: David, Jamie

- old-timers: Jules, Drew

- still trying to hire (need more people!)

2023: Instrument Quality (ADCPs)

- temperature fluctuations **did** indicate failure

  - L.M.Gould os38, Atlantis os75

- electrical noise (also indicated by temperature)

  - Thompson (os75 - was fixed during in-port)

  - Sikuliaq os38 (will address during upcoming in-port)

- strange biases

  - Sikuliaq wh300, Pt Sur wh300

- failures

  - Atlantis os75 (long saga), back on board, troubleshooting cable now.

  - previously broken Revelle os75 (replace during in-port)

  - Pelican wh300

- individual beams:

  - Kilo Moana beam 3 intermittent

  - Sikuliaq: os150 has weak beam 1

2023 Instrument Quality (not ADCPs)

- Seapath
  - Position: quality indicator= 6: "free inertial" (dead reckoning)
  - heading: reduced quality
- ABXTWO
  - end of life - replacement is BX982, not great
- Timeservers
  - VM- how to treat time?
  - ABXTWO - technically 'can serve ntp', but not very good
- Network issues
  - UDP storms (network loop) 1+ ships
  - network-based serial conversion (eg. moxa) and network glitches (1+)
- Serial data
  - Too many messages for the baud rate selected

Coming up in 2023/2024

- testing EC150 on "Falkor (too)", new EK80 software release

- Add *Taani* and *Narragansett Dawn* to the UHDAS family

- switch to the next Operating System (22.04), (finally)

  - start upgrading computers (more ship visits)

  - improve our cybersecurity posture without making things too painful

- Hire 1-2 more people

- Continue improvements in:

  - documentation

  - training

  - UHDAS monitoring and diagnostic software