Sediment coring from the US Academic Research Fleet

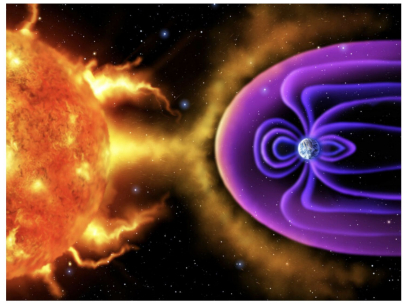
Mo Walczak

Oregon State University

Marine Rock and Sediment Sampling Facility

NSF research priorities supported by coring:

- Benthic biology
- Biogeochemical cycling
- Planetary science
- Geohazards
- Natural resources
- Climate



ANNALS OF SEISMOLOGY

THE REALLY BIG ONE

By Kathryn Schulz

July 13, 2015

Earth's Magnetic Field: Origin, Structure, and Impact on Humanity

By Eric Ralls
Earth.com staff writer

Explainers > International action on climate change >

What is deep-sea mining and how is it connected to the net zero transition?

27 July 2023

Photo: Polymetallic nodules on the deep seabed of the

NBC NEWS POLITICS U.S. NEWS WORLD BUSINESS HEALTH NBC NEWS TIPLINE VIDEO CULTURE & TRENDS WATCH LIVE

SCIENCE NEWS

Planet's deepest place may hold clues to origin of life on Earth

The deepest place on the planet may also hold the clues to the origin of life on Earth.

Ice sheets can collapse at 600 metres a day, far faster than feared, study finds

Sediments from last ice age provide 'warning from the past' for Antarctica and sea level rise today, say scientists

The 'Doomsday' Thwaites glacier in Antarctica. Photograph: Tasha Snow/AP

Ice sheets can collapse into the ocean in spurts of up to 600 metres (2,000 feet) a day, a study has found, far faster than recorded before.

Scientists said the finding, based on sea floor sediment formations from the last ice age, was a "warning from the past" for today's world in which the climate crisis is eroding ice sheets.

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OCTOBER 18, 2022

Scientists discover mechanism that can cause collapse of great Atlantic circulation system

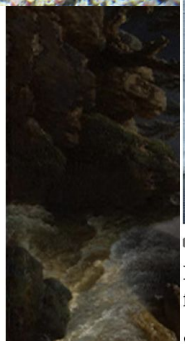
by José Tadeu Arantes, FAPESP

GEOSCIENCE

The Secret Messages in Ancient Storms

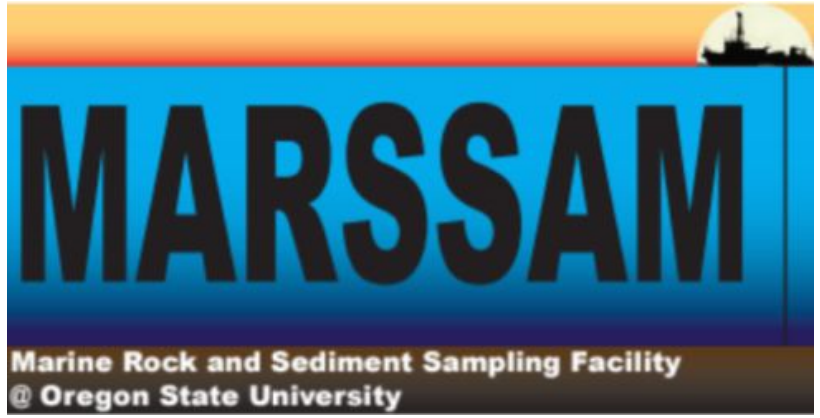
Paleotempestology promises to uncover patterns of historical hurricanes—to better predict destructive weather of the future.

BY KATARINA ZIMMER June 23, 2023

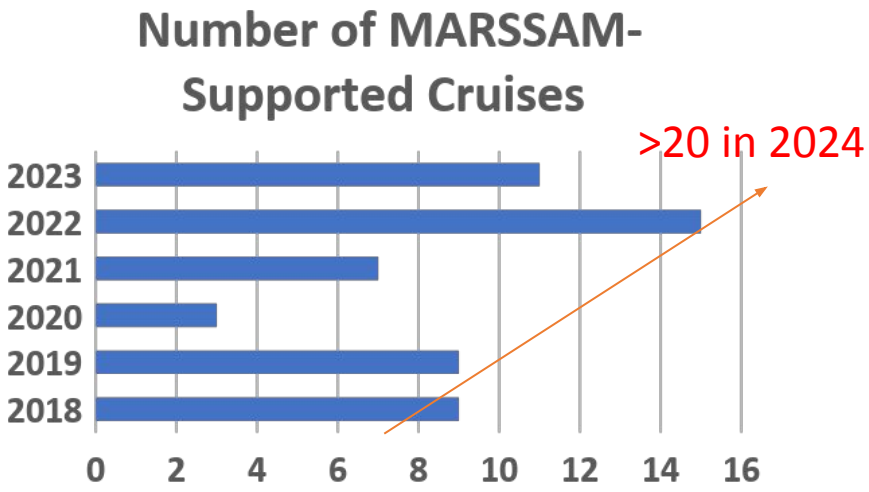


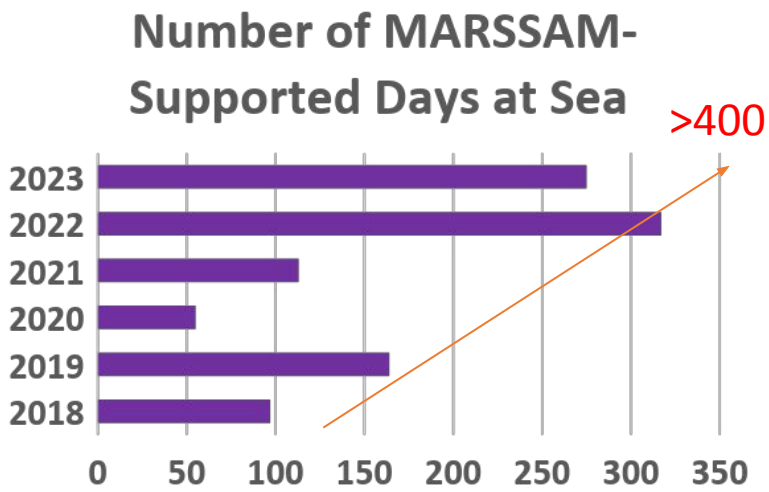
***Ma**rine **R**ock and **S**ediment **Sam**pling (MARSSAM) Facility*

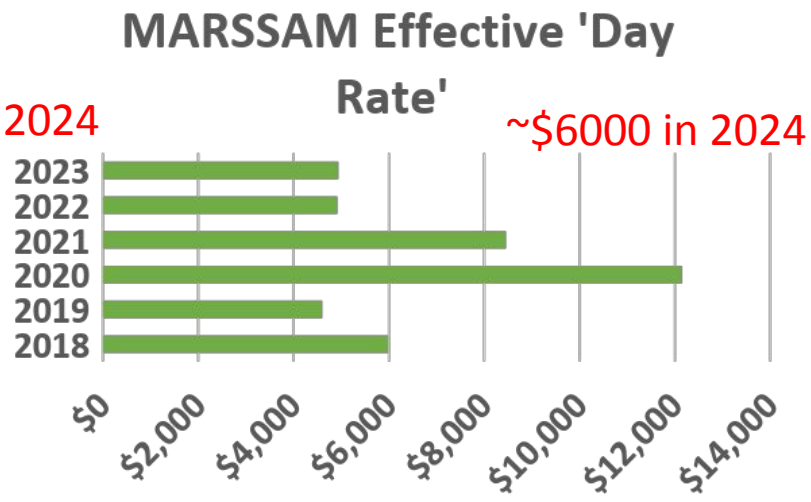
OSU-based national coring and dredging facility supporting NSF research across the country



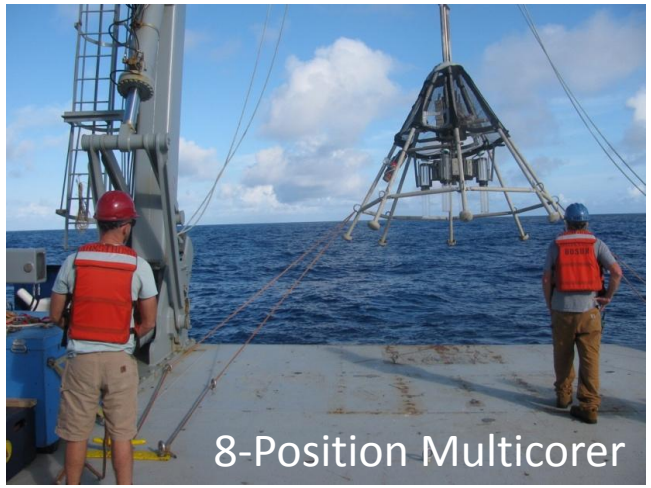
Support operations across the US Academic Research Fleet as well as on polar assets USCG Healy and R/V Palmer and on domestic and international contract platforms

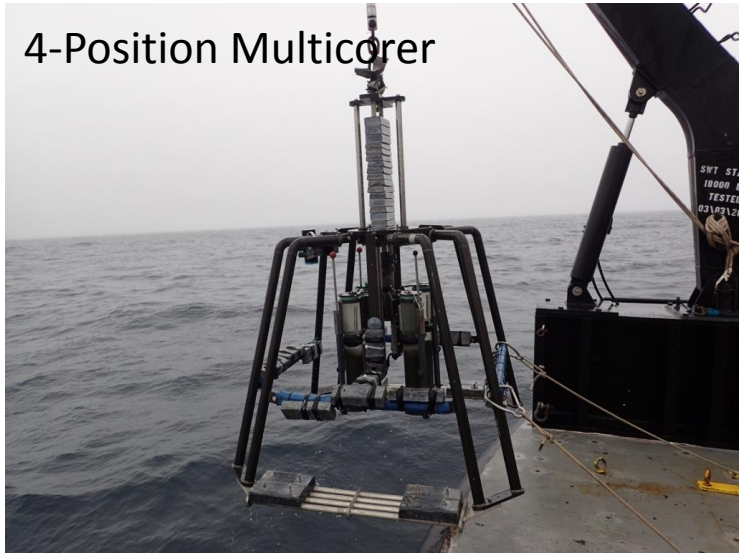




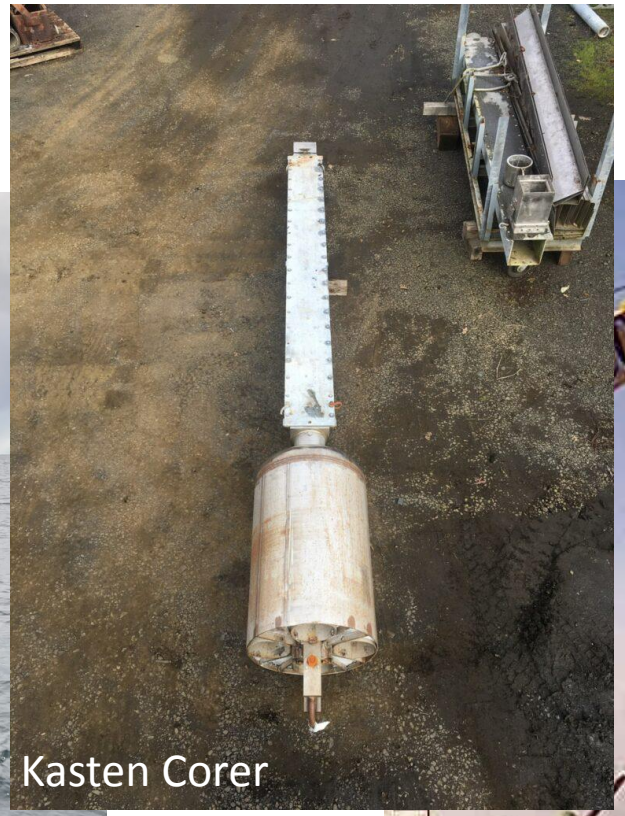


MARSSAM Inventory – Sed/Water Interface

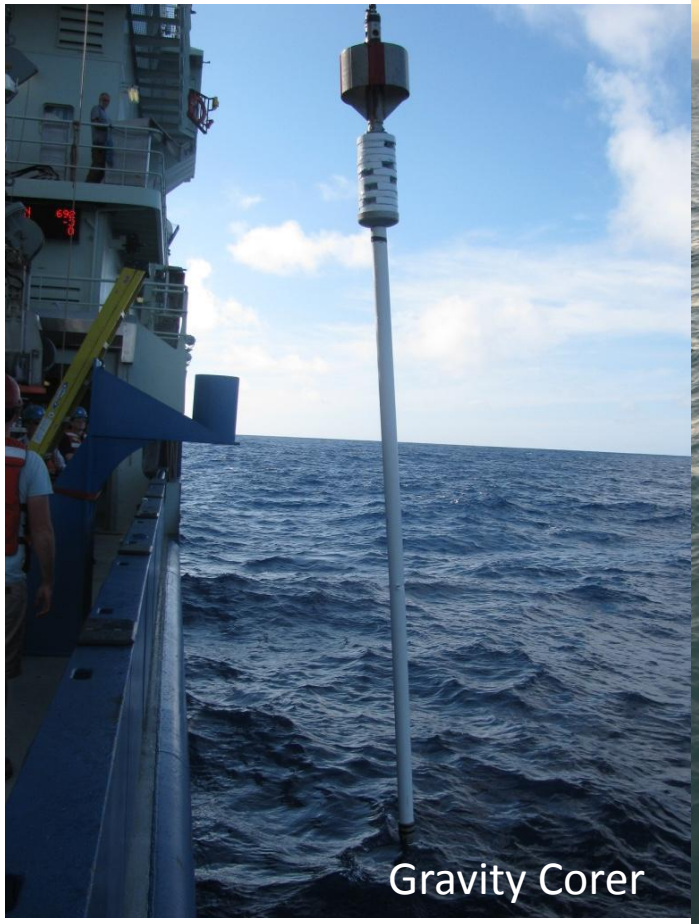




MARSSAM Inventory – "Challenging" Sediments

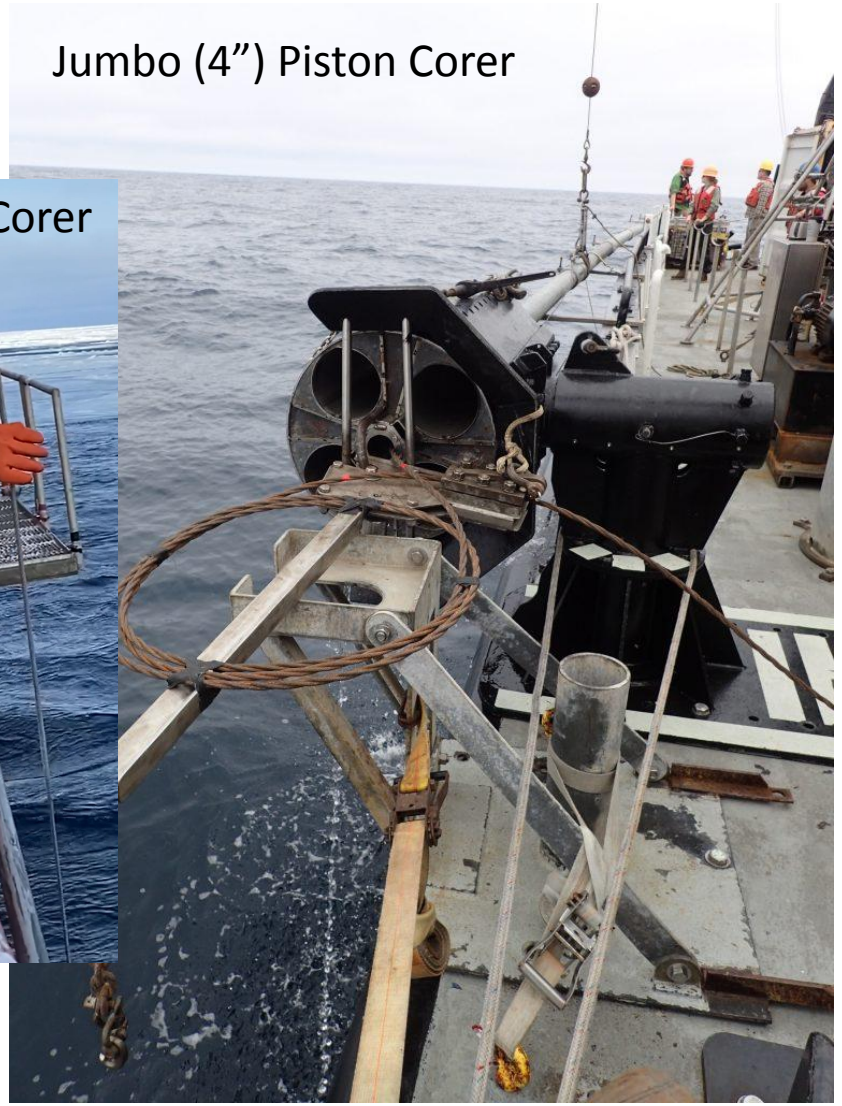


MARSSAM Inventory – *Deep Sediments*


Gravity Corer


Giant Gravity Corer


(2.5”) Piston Corer


Jumbo (4”) Piston Corer

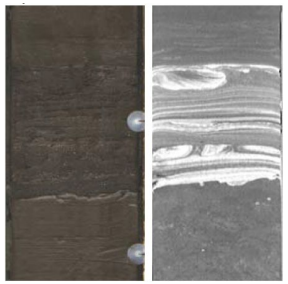
Seagoing Instrumentation:

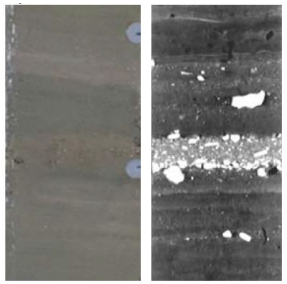
Lab vans that can be equipped with multi-sensor core logger, basic x-radiography system, vertical sediment CT scanner…

New refrigerated pore-water van coming online in 2024

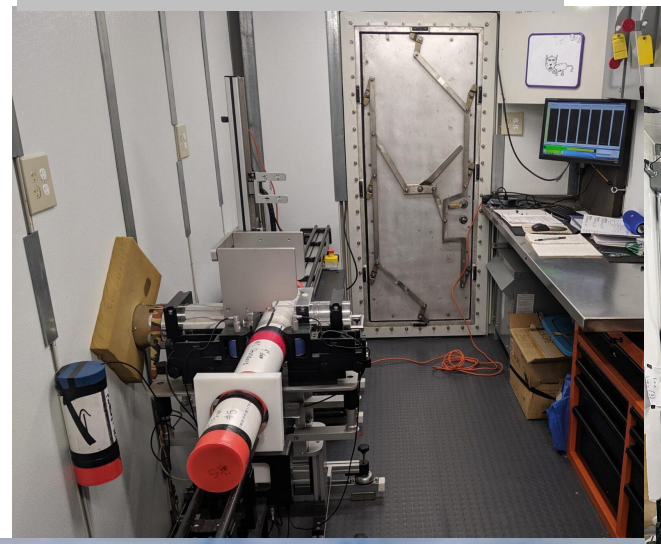
Instrumenting corers to better understand recovery

Expanding collaboration with WHOI MISO facility as well as addition of new cameras





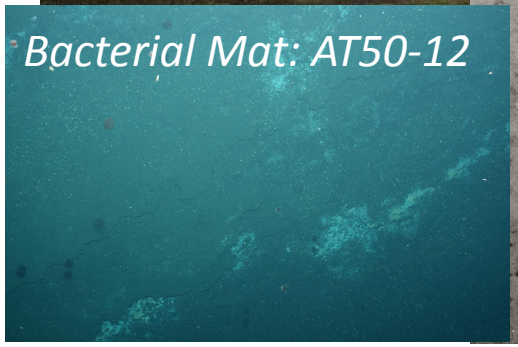
MARSSAM MSCL Van



MARSSAM CT Van

Ice-rafted debris: AR7608B

Bacterial Mat: AT50-12

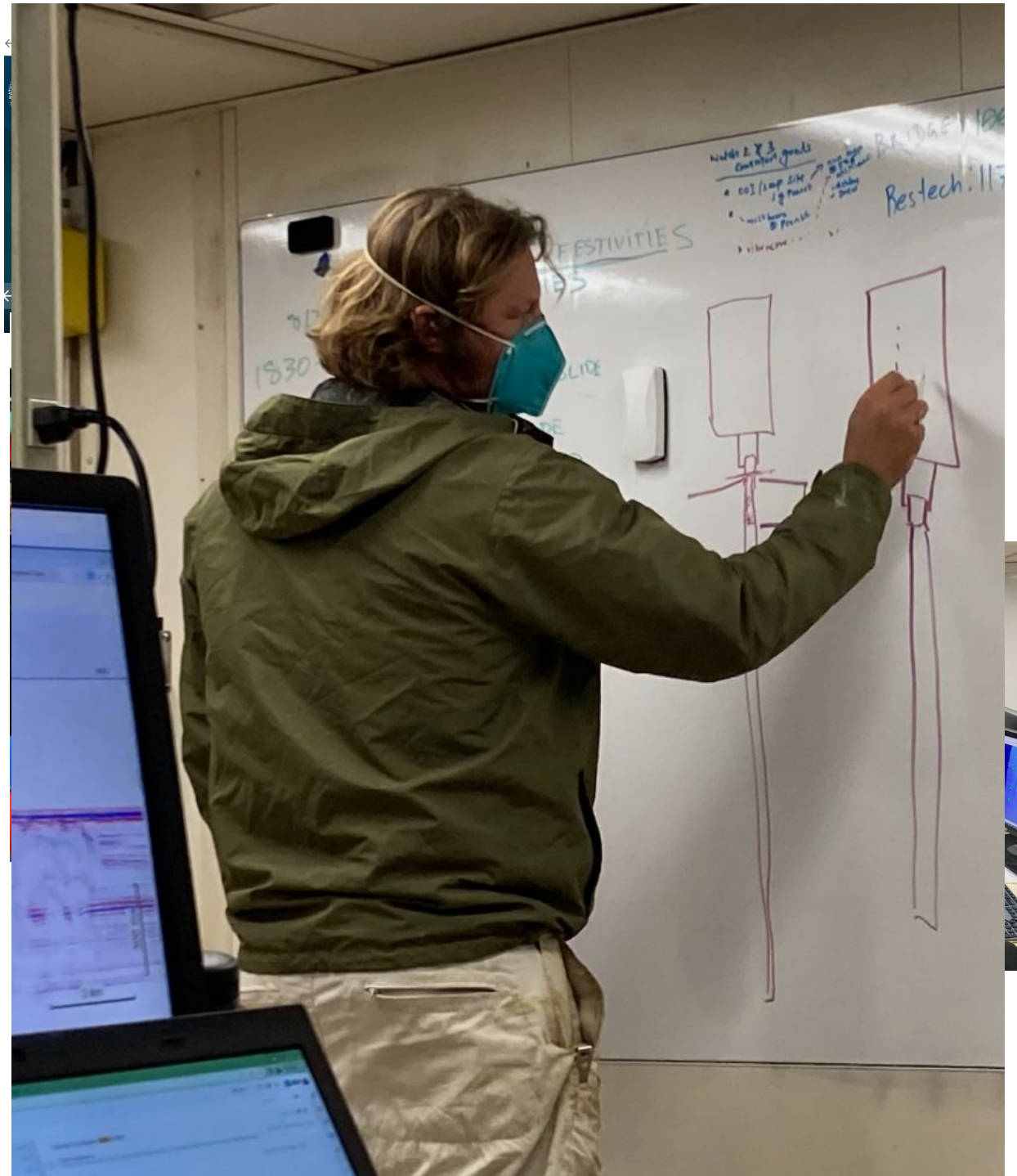


Soup to Nuts:

- Support for PI's in technical aspects of cruise planning to best meet scientific objectives

- Provision of sampling equipment, consumables, related shipboard instrumentation, and expert support for deck operations

- Cold-chain shipping of recovered materials back to an NSF repository of choice, **where they are curated and made available for decades of scientific exploration** after moratorium expiration



Near-future demand:

- Paleoenvironmental records with high-accumulation rates
- Deep biosphere
- Ice sheets/Glacial behavior
- Geohazards
- Facilitating seafloor sampling on smaller vessels/vessels of opportunity
- Supporting US drilling community through vessel transition

Maintaining US Leadership

- Capitalize on assets in hand to the greatest extent possible
- Match science objectives to most efficient technology
- Think creatively about solutions in the near, intermediate, and long term, and move on all fronts
- ***Follow the science***