The NOAA-University of New Hampshire Joint Hydrographic Center

A National Center for Research and Education in Hydrography and Ocean Mapping
Complementary Centers

- NOAA/UNH Joint Hydrographic Center (JHC)
  - A NOAA and University Partnership
  - Congressionally authorized and appropriated
  - Funded through a competitive Cooperative Agreement

- UNH Center for Coastal and Ocean Mapping (CCOM)
  - Provides for participation of private sector and other government agencies
Center Goals

To be a world leader in the development of hydrographic and ocean mapping technologies and approaches.

To expand the scope of ocean mapping clients and constituencies through the development of innovative applications and collaborative work with both the private sector and government labs.
Staffing

- 17 Research and Teaching Faculty
- 12 Affiliate Faculty members
- 21 Research Scientists and Staff
- 9 Support Staff (Admin, IT, Design, Facility, Outreach)
- 12 NOAA Scientists
- 25 M.S. and Ph.D. graduate students
Acoustic and Wave Tank Test Facilities

Acoustic Calibration and Equipment Test Tank

60’ x 40’ x 20’

Wave and Tow Tank

120’ x 12’ x 8’
Research Vessels

R/V Gulf Surveyor

R/V Cocheco

Higgs Zego Boat
ASVs

ASV4—ASV Global
Aboard NOAA Ship Fairweather in the Arctic

SEA-KIT AS—Designed by GEBCO Alumni Team
Ready for X-Prize finals

DriX—iXBlue
Arriving this summer

Z-Boat—Teledyne OceanScience

EMILY Boat—Extended loan from OAR

EchoBoat—Seafloor Systems
Instruction and Presentation Facilities

- High-end Macintosh, Linux, and PC workstations
- Training classroom with 18 workstations
- Visualization Classroom
- Auditorium Classroom
- High-end 48- and 60-inch large-format plotters and 60-inch scanner
- Geowall-2 and other large-format displays
Telepresence Center
Applied Research
Emphasis on Research to Operations

- Underwater acoustics
- Lidar & coastal & ocean remote sensing
- Hydrographic data processing and analysis
- Electronic Chart of the Future
- Seafloor characterization
- Water column mapping
- Ocean data visualization
- Autonomous vessels
- Continental shelf mapping
- Crowd-sourced bathymetry
- And many more....
48 Industrial Associates

ACOUSTIC IMAGING
ALIDADE HYDROGRAPHIC
AML OCEANOGRAPHIC
ANTHROPOCENE INSTITUTE
ASV GLOBAL
BOULDER EQUITY ANALYTICS
CHESAPEAKE TECHNOLOGIES
CLEARWATER SEAFOODS
EDGETECH
EIVA
ESRI
EXXON MOBIL
FUGRO USA MARINE
GARMIN
GENERAL DYNAMICS BLUEFIN ROBOTICS
HIGGS HYDROGRAPHIC TEK
HYDROID
HYPACK
IFREMER
IIC TECHNOLOGIES
iXBLUE
KLEIN MARINE SYSTEMS
KONGSBERG UNDERWATER TECHNOLOGY
LEIDOS
MARITIME ALLIANCE
NORBIT SUBSEA
NOVATEL
OCEAN HIGH TECHNOLOGY INSTITUTE
PHOENIX INTERNATIONAL
QPS
QUESTER TANGENT
R2SONIC
ROBOTICS
SEA ID
SEVEN Cs
SMT KINGDOM
SUBSTRUCTURE
SURVICE ENGINEERING
TELEDYNE BENTHOS
TELEDYNE CARIS
TELEDYNESOCEAN SCIENCE
TELEDYNE ODOM
HYDROGRAPHIC
TELEDYNE OPTECH
TELEDYNE RESON
TRITON IMAGING INC
TYCOM LTD
YSI, INC. SEA MACHINES
Sonar calibration

In Tank
Measurements of:
Beam pattern, driving point impedance, transmit voltage response and receive sensitivity

In Field
Suspended targets and trilateration of buoys
CUBE (combined uncertainty and bathymetric estimator)

Automated depth and uncertainty with indications of problem areas

Worldwide standard for Hydrographic Offices
CHRT (CUBE with Hierarchical Resolution Technology)

Solves variable resolution problem for surveys covering wide depth ranges (Alaska)

H12142 (Glacier Bay); Data: NOAA, CARIS
CHRT Resolution display

H12142 (Glacier Bay); Data: NOAA, CARIS

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Geocoder for multibeam backscatter processing
Shallow-water bathymetry from AUVs

Surface vessel with Reson 7125

GAVIA with GeoSwath
Vertical Uncertainty for Bathy/Topo Lidar

Collaboration with NOAA Remote Sensing Division and Oregon State University

Riegl VQ-880-G Survey
HydrOffice Suite

Sound Speed Manager

Automatic creation, assessment, application and tracking of sound speed profiles for hydrographic survey and ocean mapping
Bathymetry and Seafloor Character from Fisheries Sonars
Mid-water mapping and detection of seafloor gas seeps
Internal Waves
~10m amplitude, 100m wavelength

Superimposed Billows
5-10m amplitude, 20m wavelength

Tracing seafloor mapping anomalies to water column features
Center Goals

To educate a new generation of hydrographers and ocean mappers who can meet the growing needs of both government agencies and the private sector.
Educational Programs

- M.S. and Ph.D.
  - Two tracks:
    - Engineering: Ocean, Electrical, or Mechanical
    - Earth Sciences/Computer Science/Oceanography/Natural Resources
- Graduate Certificate Program
- Nippon Foundation/GEBCO Training Program
- FIG/IHO/ICA CAT A Recognition
  - recertified April 2018