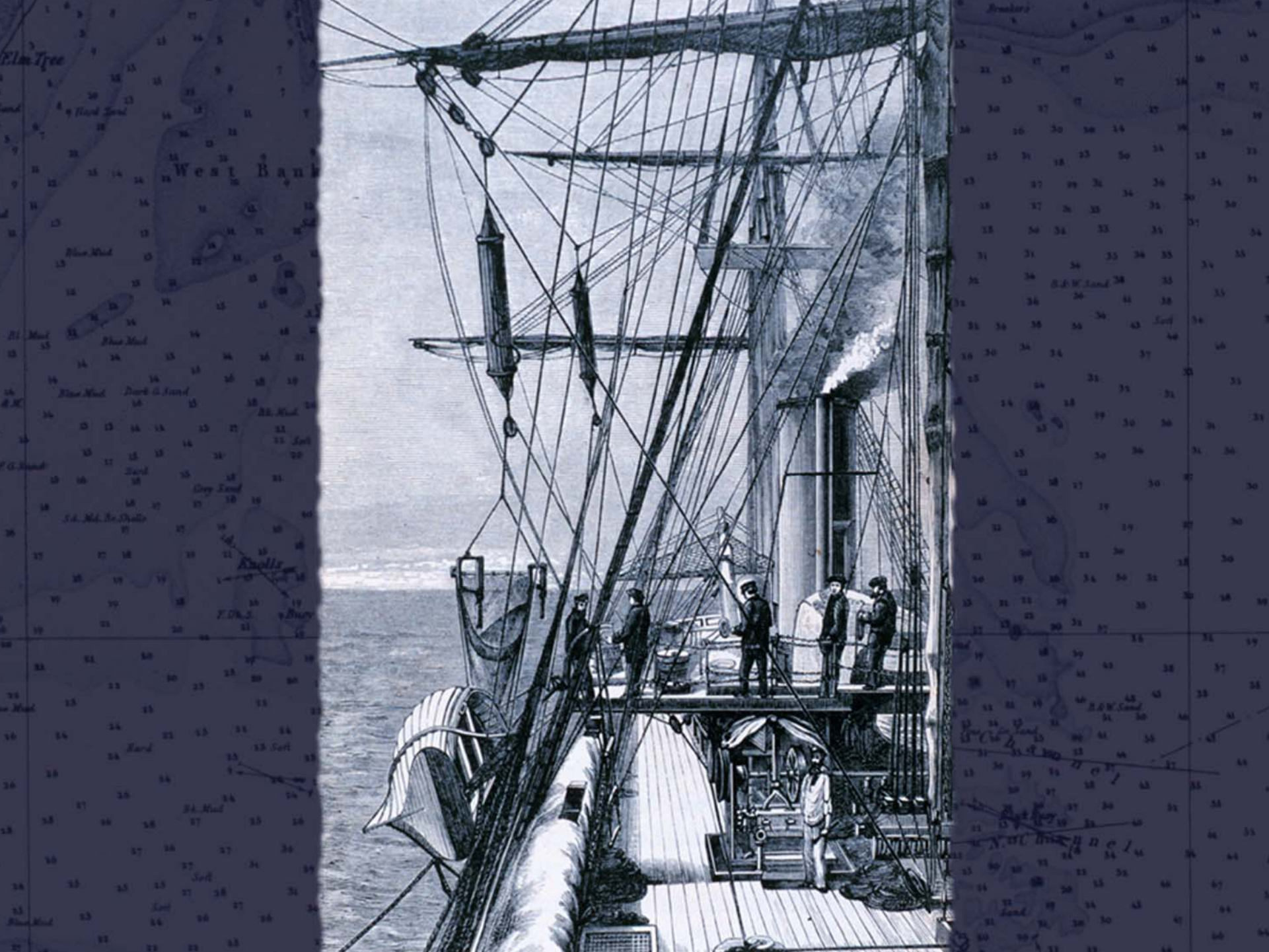
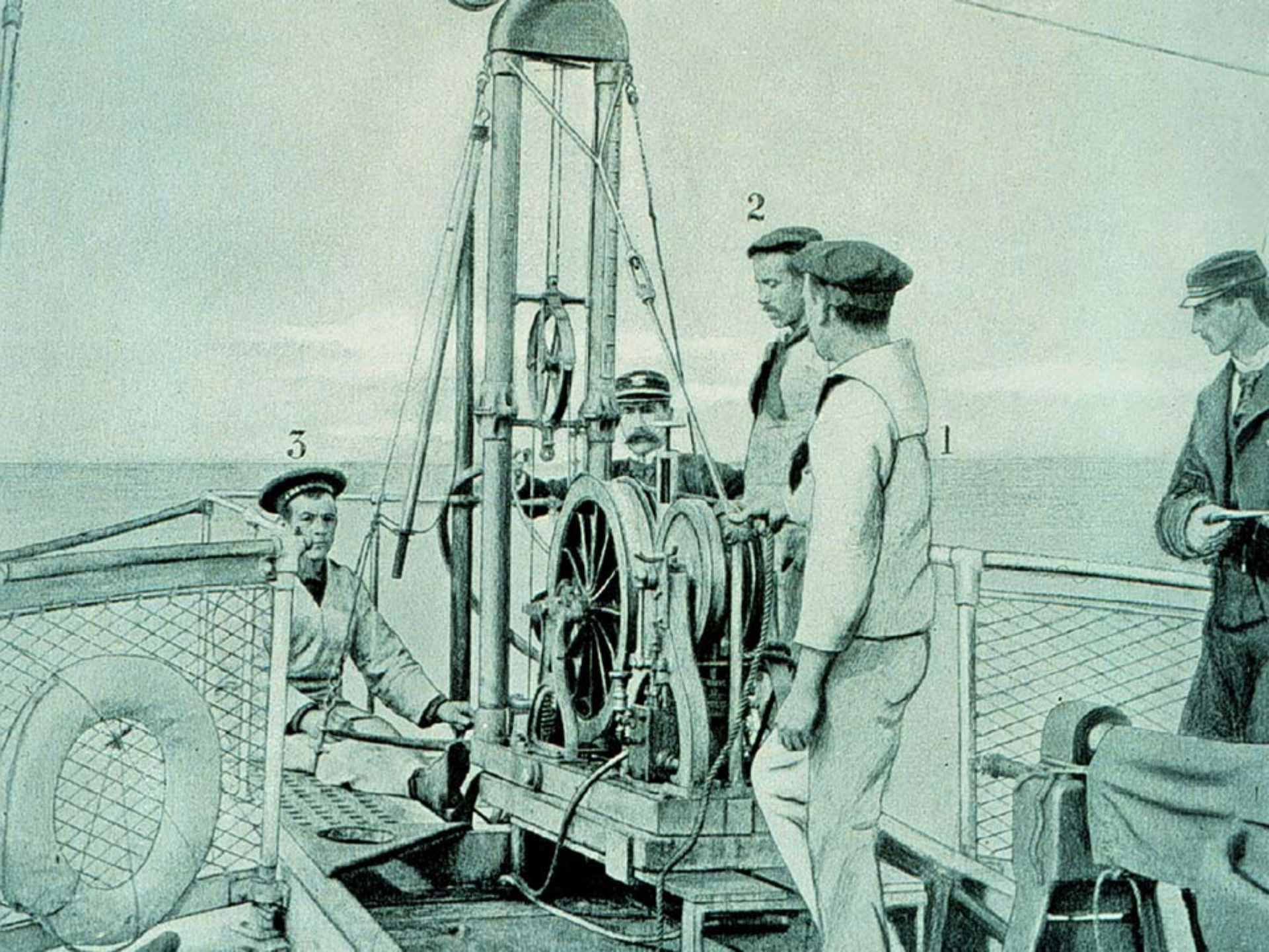
Elm Tree
West Bank
White Buoy
Fourteen Feet Ch.
Knolls
Buoy
Gedney's Channel
Main Ship Channel
Black Buoy
Breakers
Sand
Mud
Soft
Hard
Blue Mud
Dark G. Sand
Grey Sand
Black Buoy

Elm Tree
West Ban
Knolls
Tidwinus
Vehir bucht Croiland

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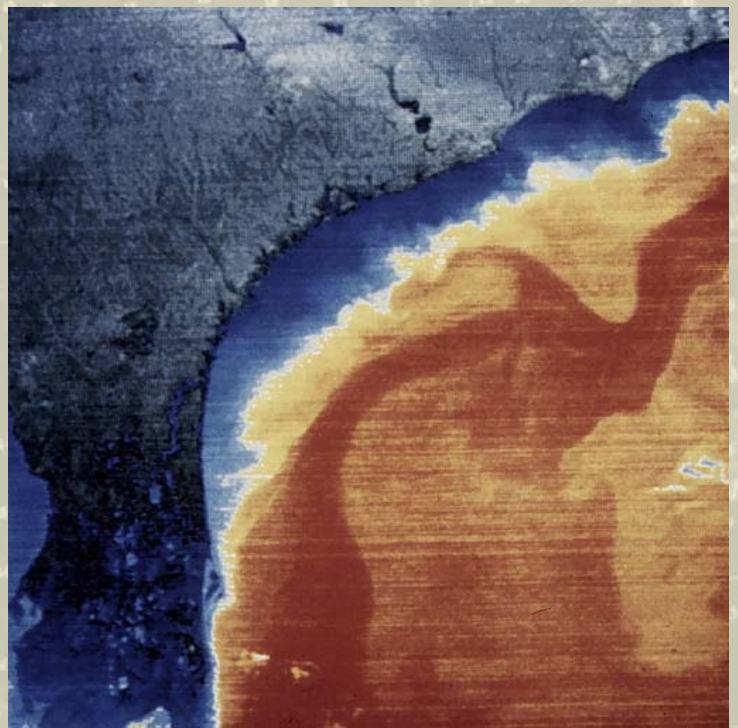
OPERATIONAL OCEANOGRAPHY

from historical innovations to modern observation systems and forecast models



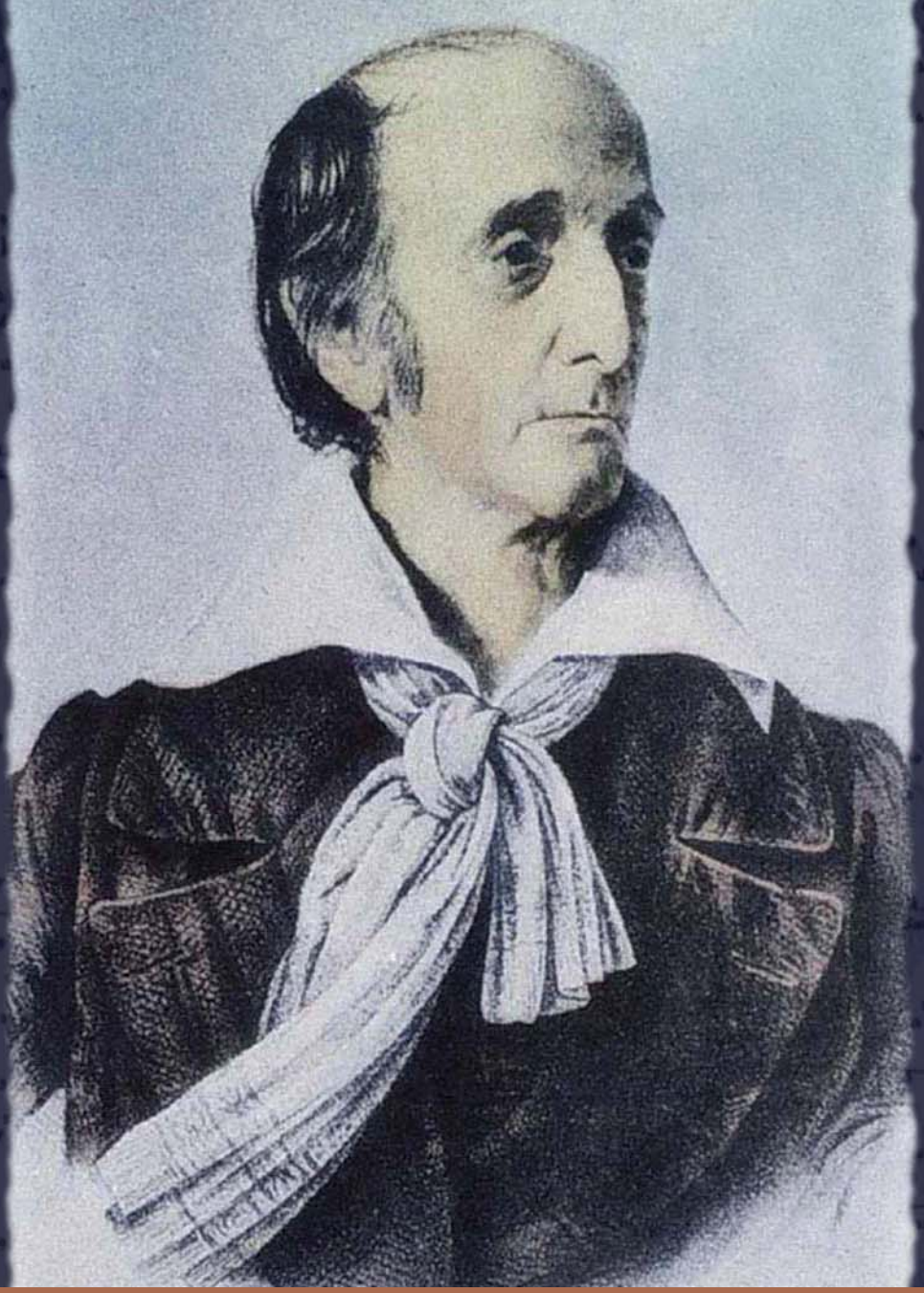
Richard W. Spinrad, Ph.D.

Assistant Administrator

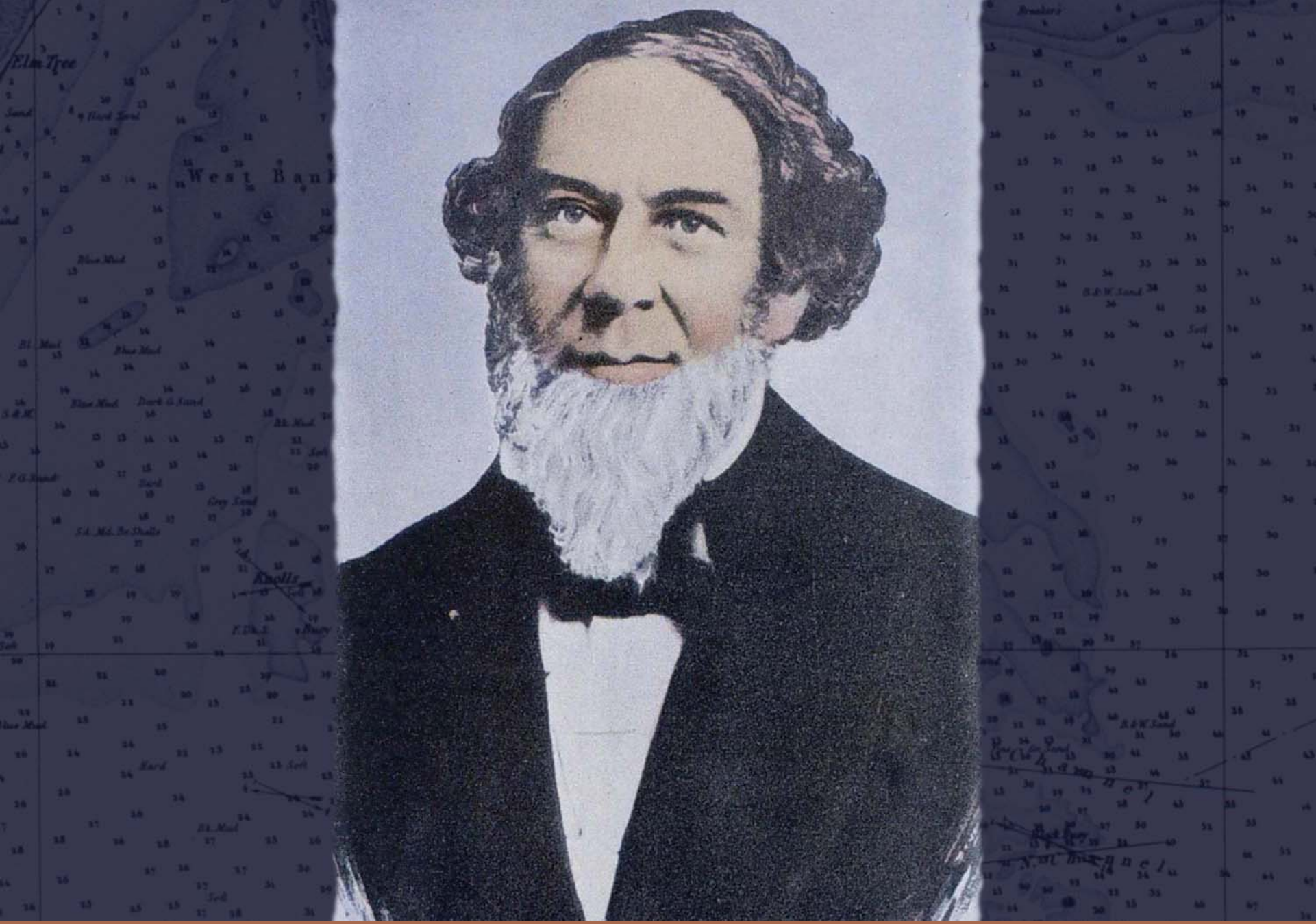
NOAA'S NATIONAL OCEAN SERVICE

NOAA's ROLE IN OPERATIONAL OCEANOGRAPHY

- NOAA's historical role in operational oceanography
- NOAA's current capabilities
- NOAA's future in operational oceanography: ocean and coastal observing systems

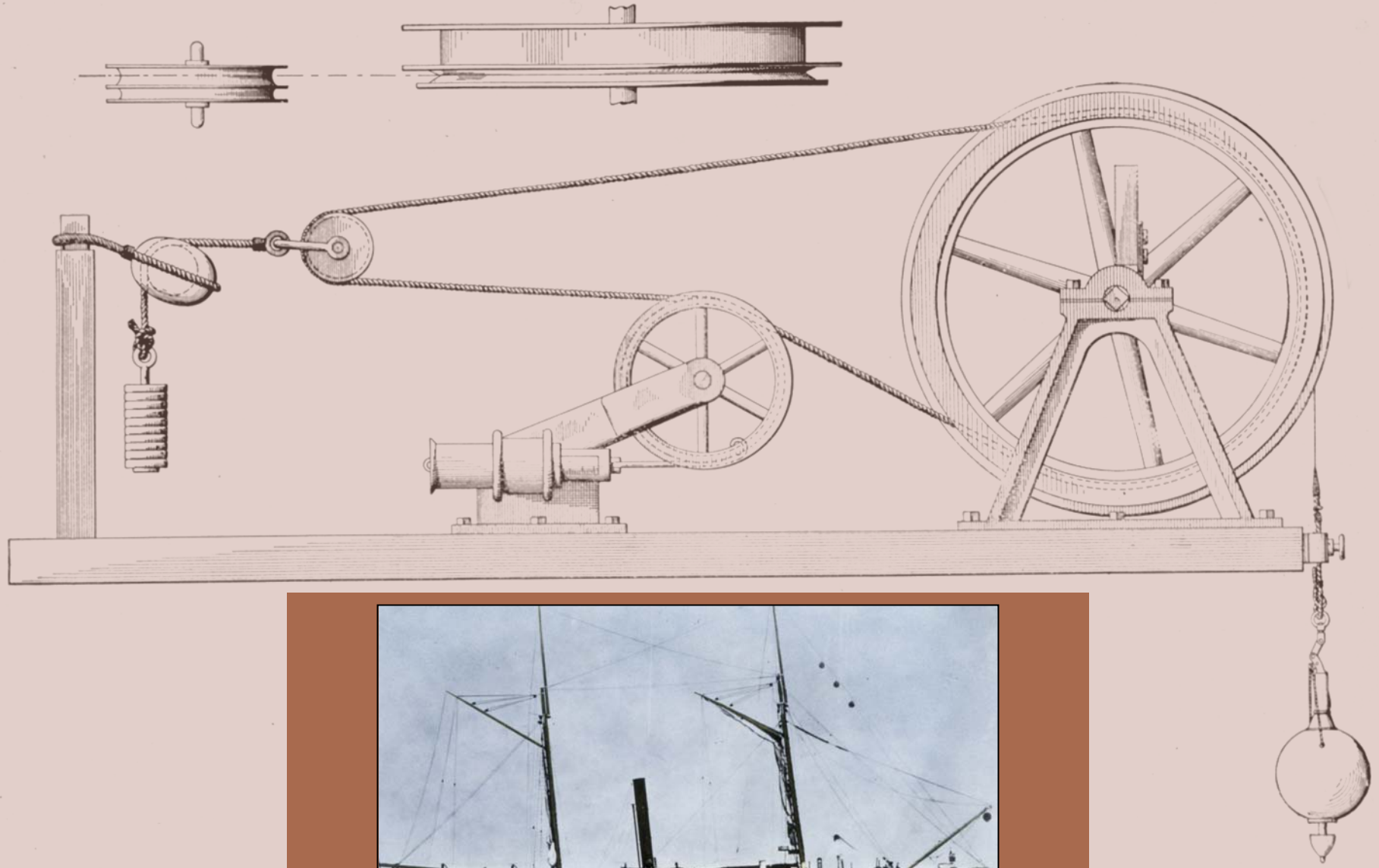


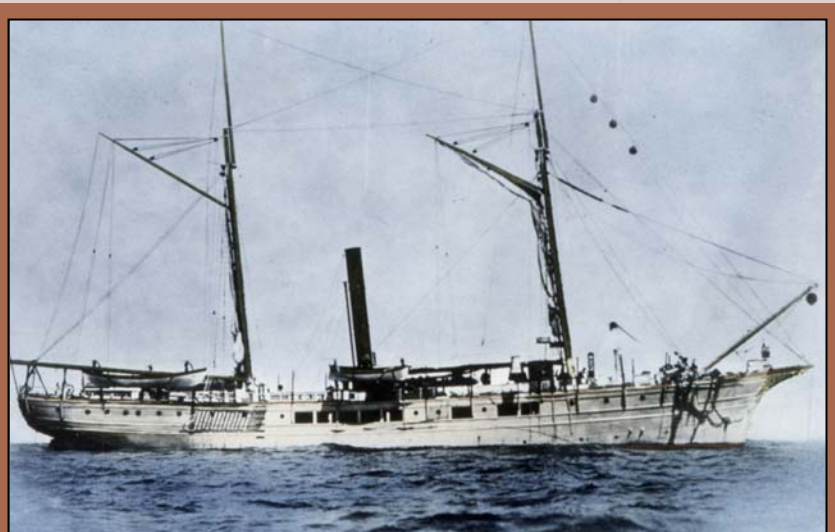
FERDINAND HASSLER

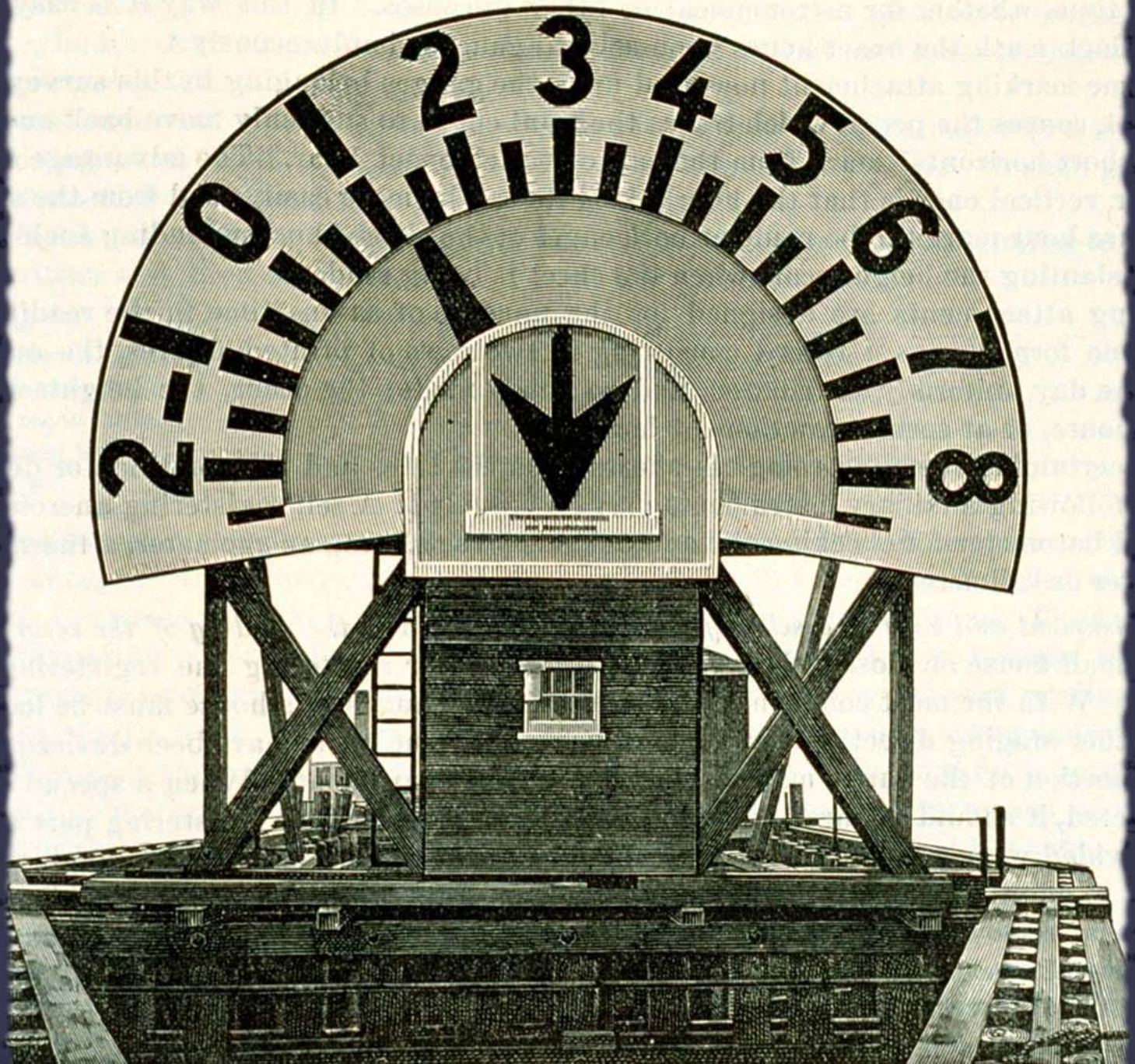


ALEXANDER BACHE

LAND
of the
ESKIMAUX's or LABRADOR
LABRADOR
ATLANTIC OCEAN
France
Spain
Barbary
Coast of
BARBARY
GULF
of
St. LAURENCE
NEW
FOUNDLAND
NOVA SCOTIA
NEW ENGLAND
NEW
HAMPSHIRE
MASSACHUSETS
CONNECTICUT
G.r BANK
Sable I.
of Newfoundland
LAKE
HURON
LAKE MICHIGAN
LAKE
ONTARIO
LAKE ERIE
NEW YORK
PENNSYLVANIA
MARY LAND
VIRGINIA
NORTH CAROLINA
SOUTH CAROLINA
GEORGIA
WEST FLORIDA
EAST
Bermuda I.
A
CHART
of The
GULF STREAM



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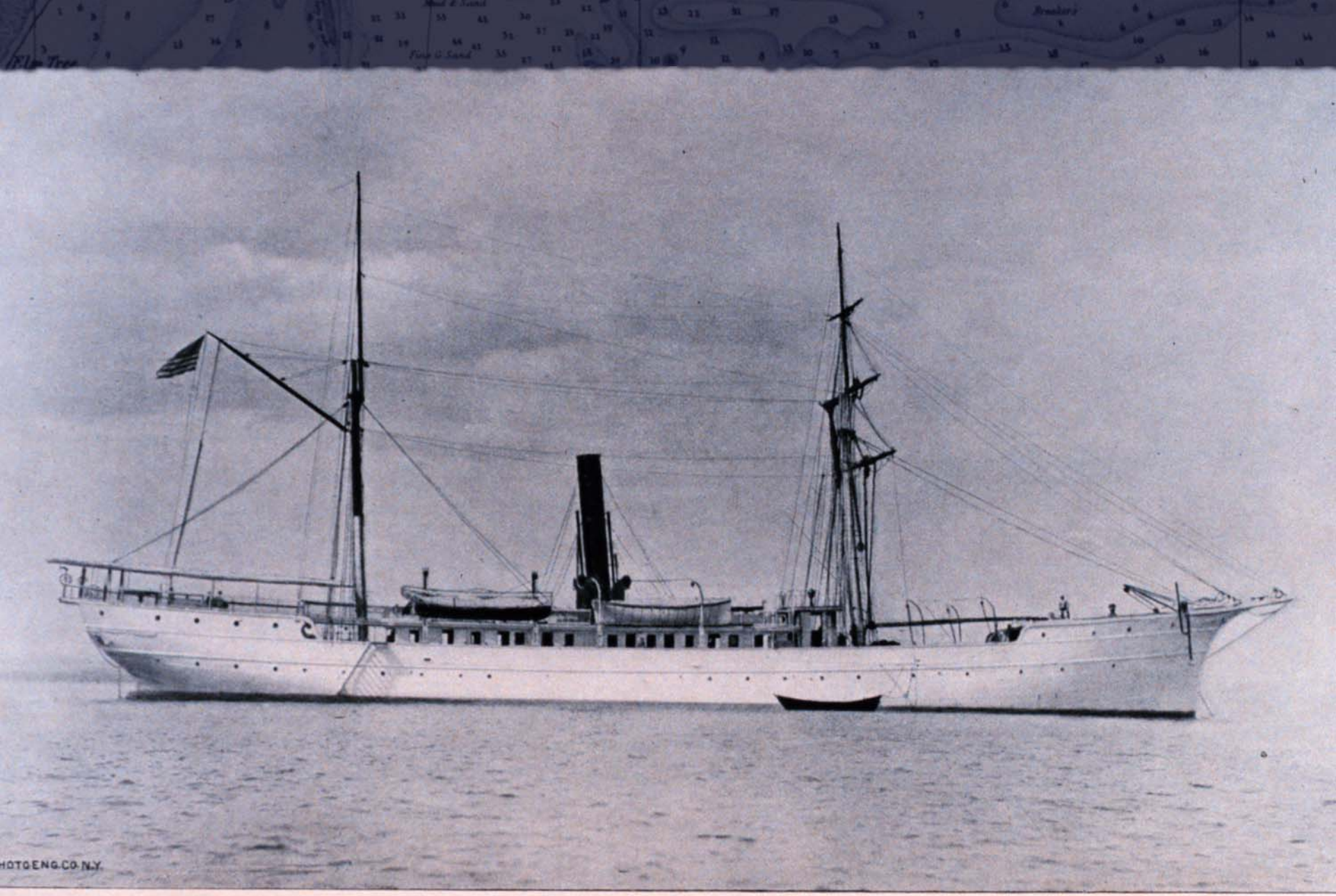
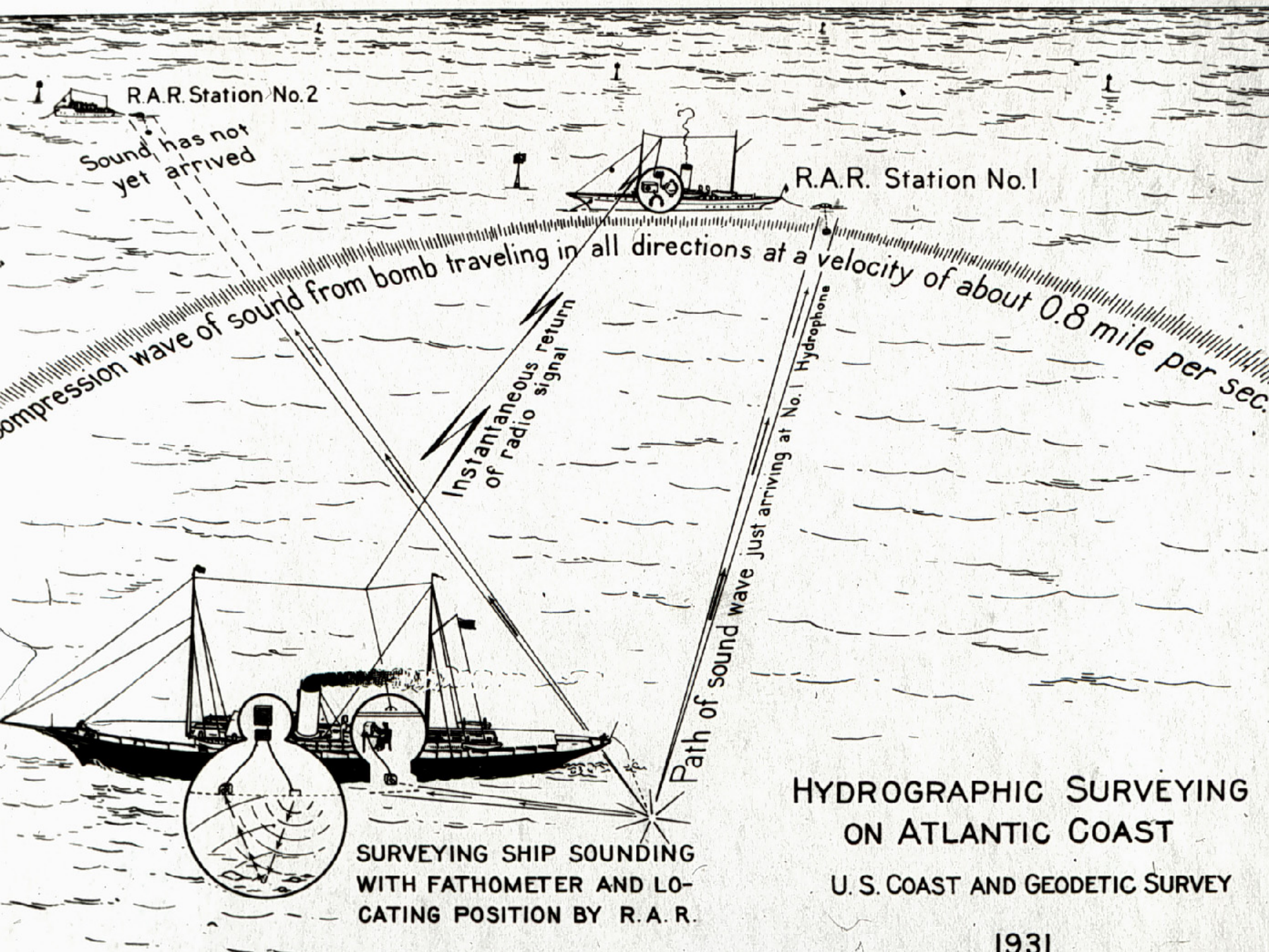


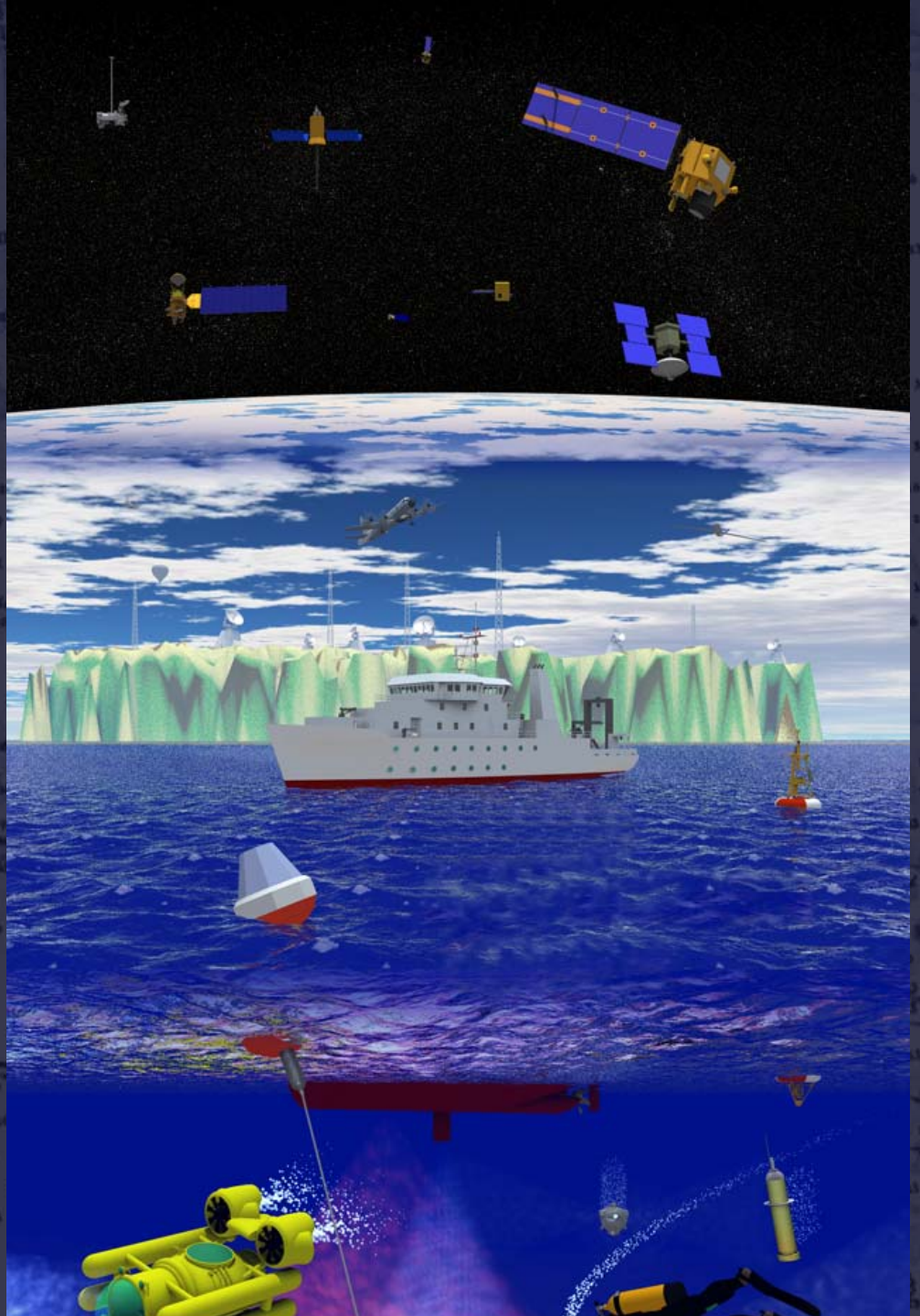
THE ALBATROSS.



HYDROGRAPHIC SURVEYING ON ATLANTIC COAST

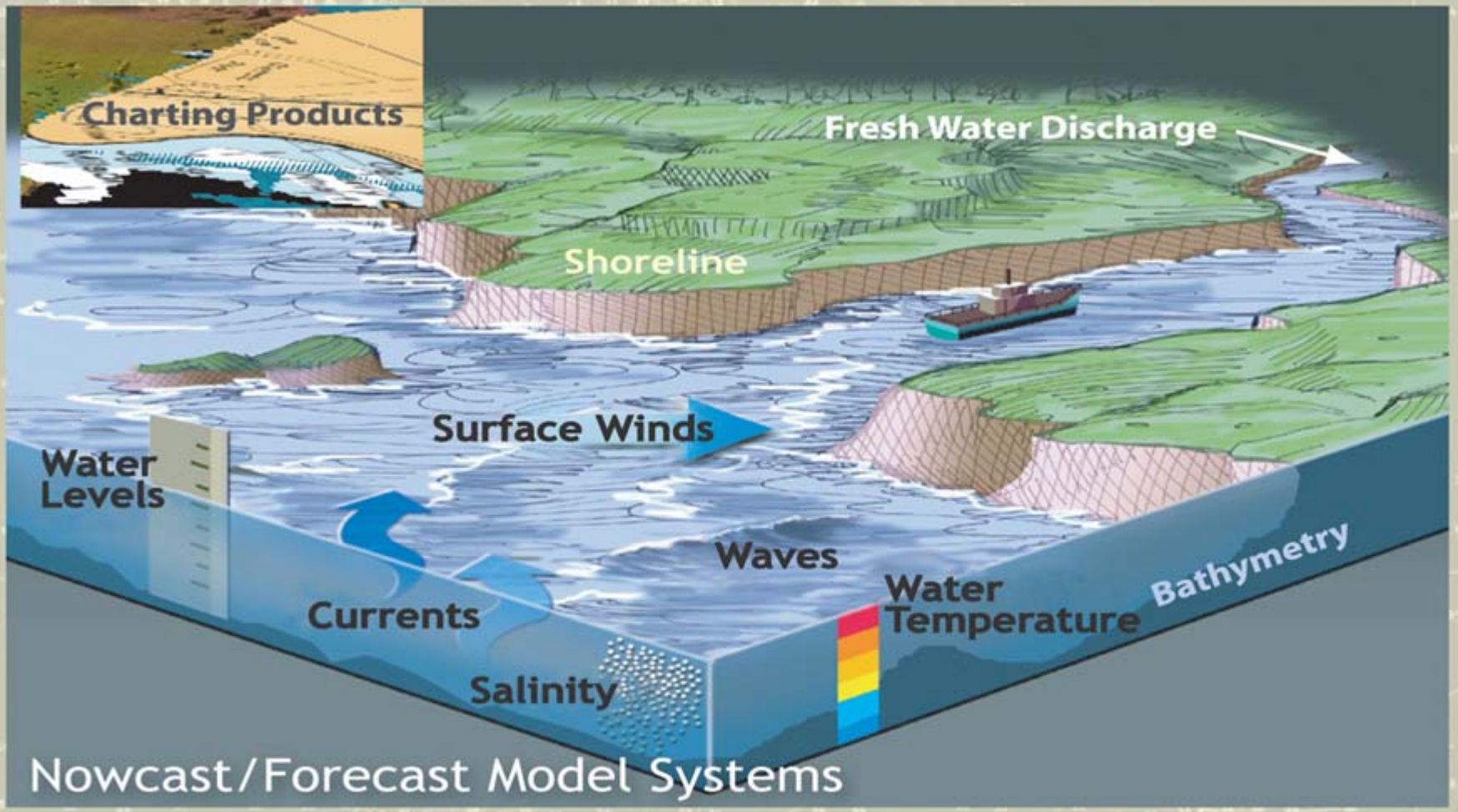
U. S. COAST AND GEODETIC SURVEY

1931

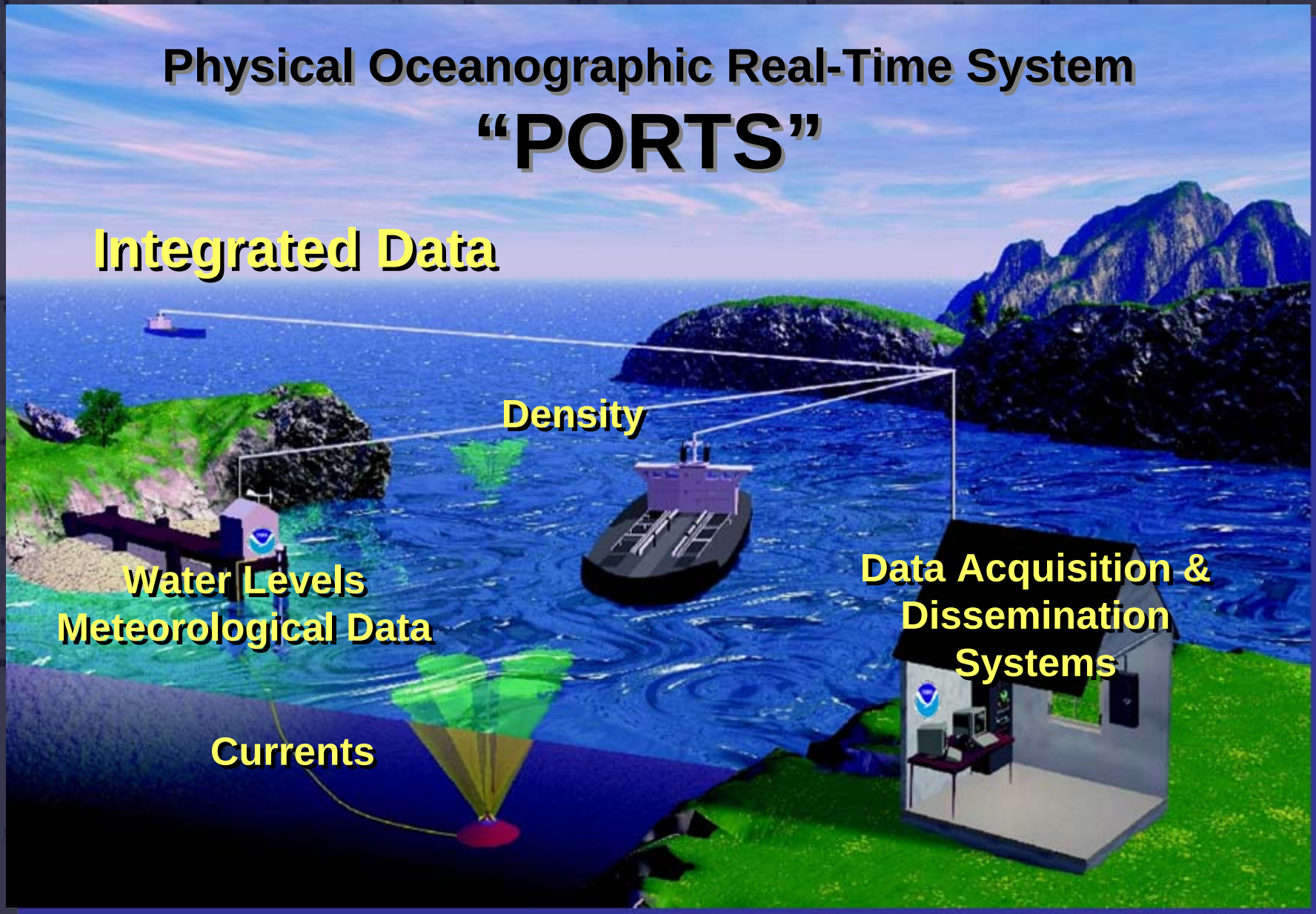


TAO

BRINGING IT ALL TOGETHER



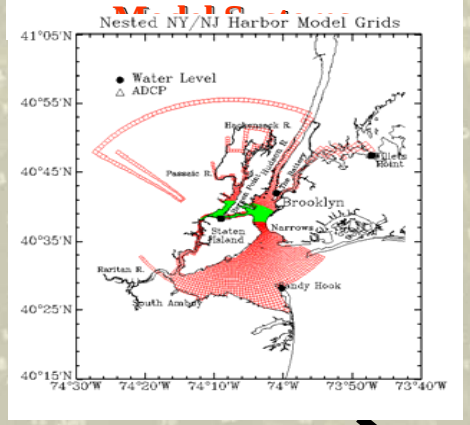
Physical Oceanographic Real-Time System
"PORTS"



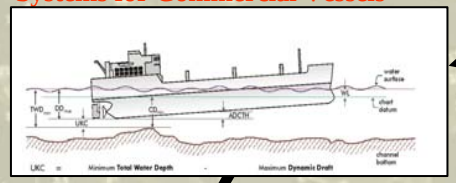
SAFE AND EFFICIENT NAVIGATION

Weather Forecast Models

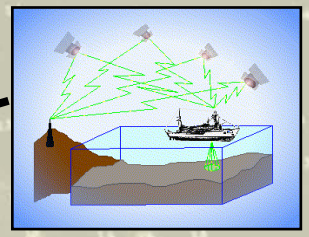
Oceanographic Forecast



Dynamic Draft Prediction Systems for Commercial Vessels



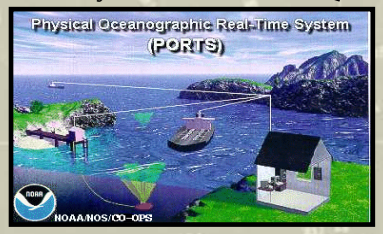
RTK-GPS Dynamic Draft Measurements on Vessels



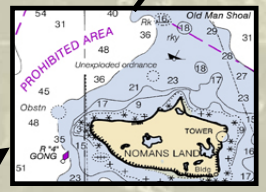
Efficiency

Safety

Real-time Oceanographic Data Systems



Under-Keel Clearance Forecasting



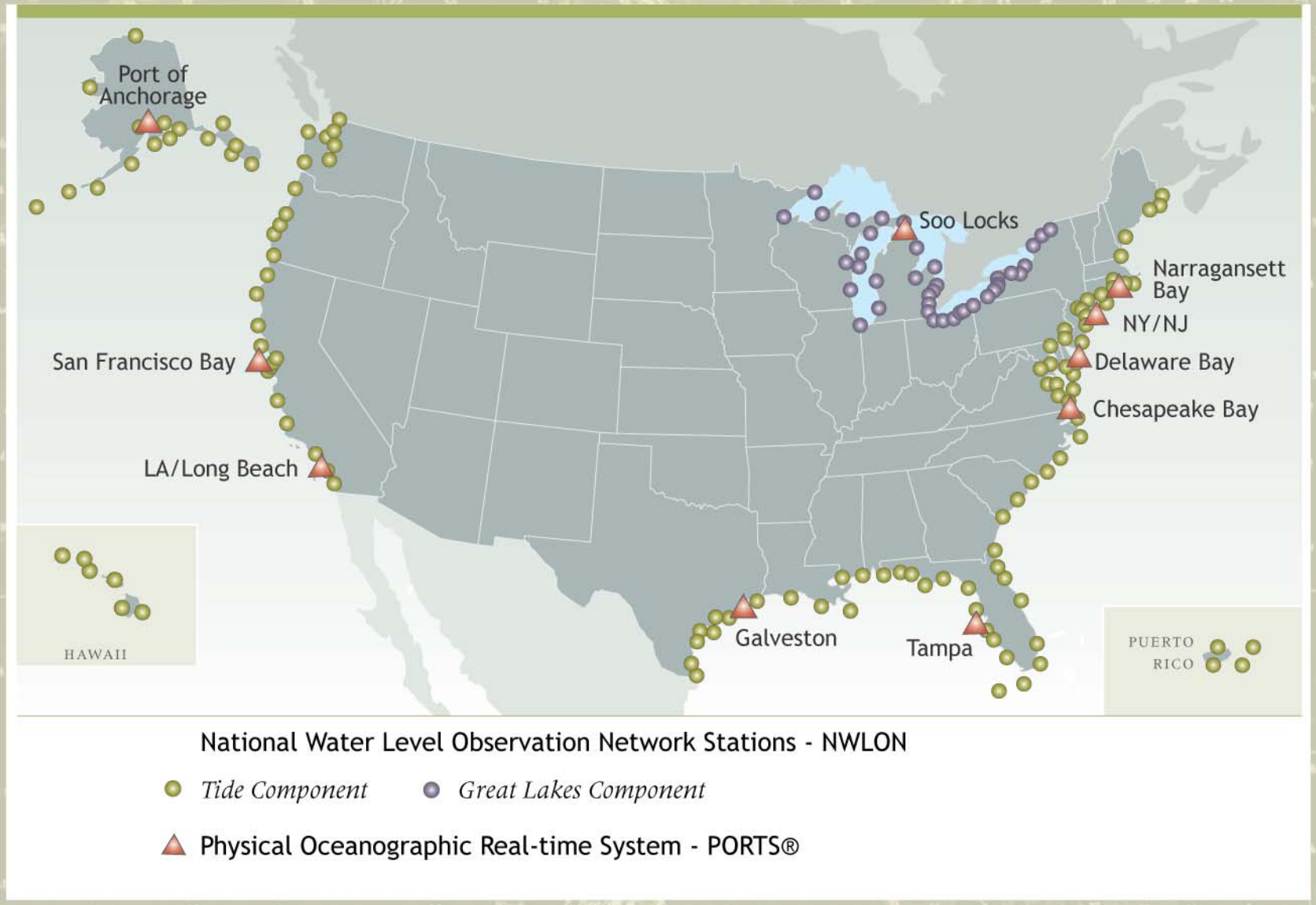
Nautical Charts

Electronic Navigational Charts

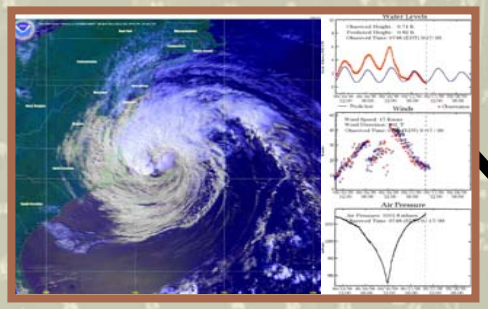
Bathymetric Data from SW Multibeam and HSHR Side Scan Sonar

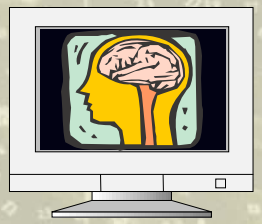
- **Reduce delays**
- **Maximize load**
- **Savings in cost of transport**
- **Increase in exports**

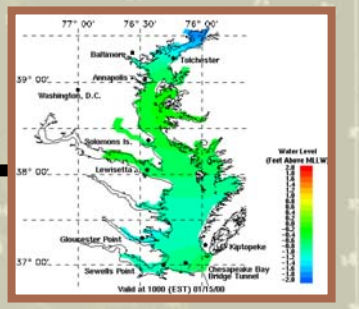
REAL-TIME COASTAL OCEAN OBS SYSTEMS

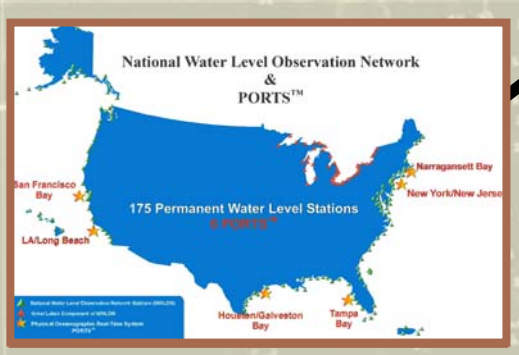


WORKING TOWARD FUTURE CAPABILITIES





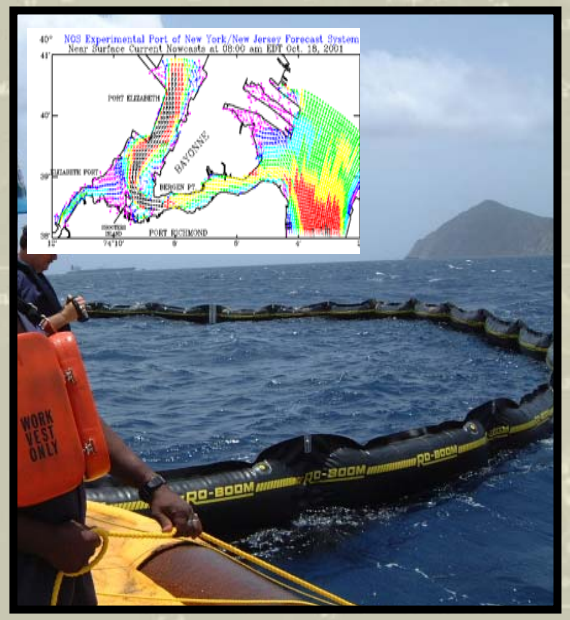




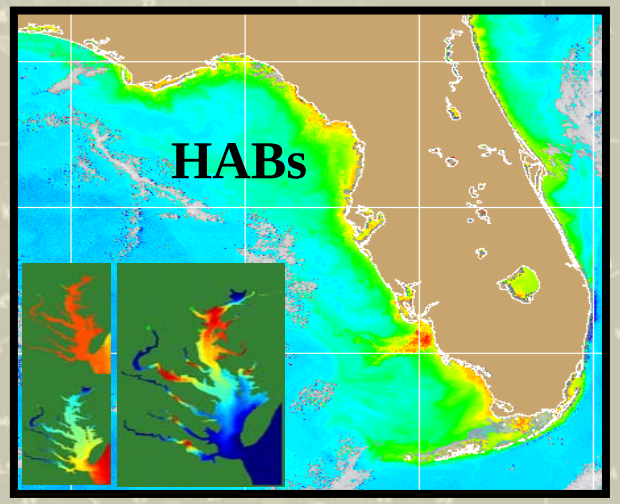
SAFE NAVIGATION
- avoid groundings
- avoid collisions

SEARCH & RESCUE

EFFICIENT NAVIGATION
- help improve port throughput



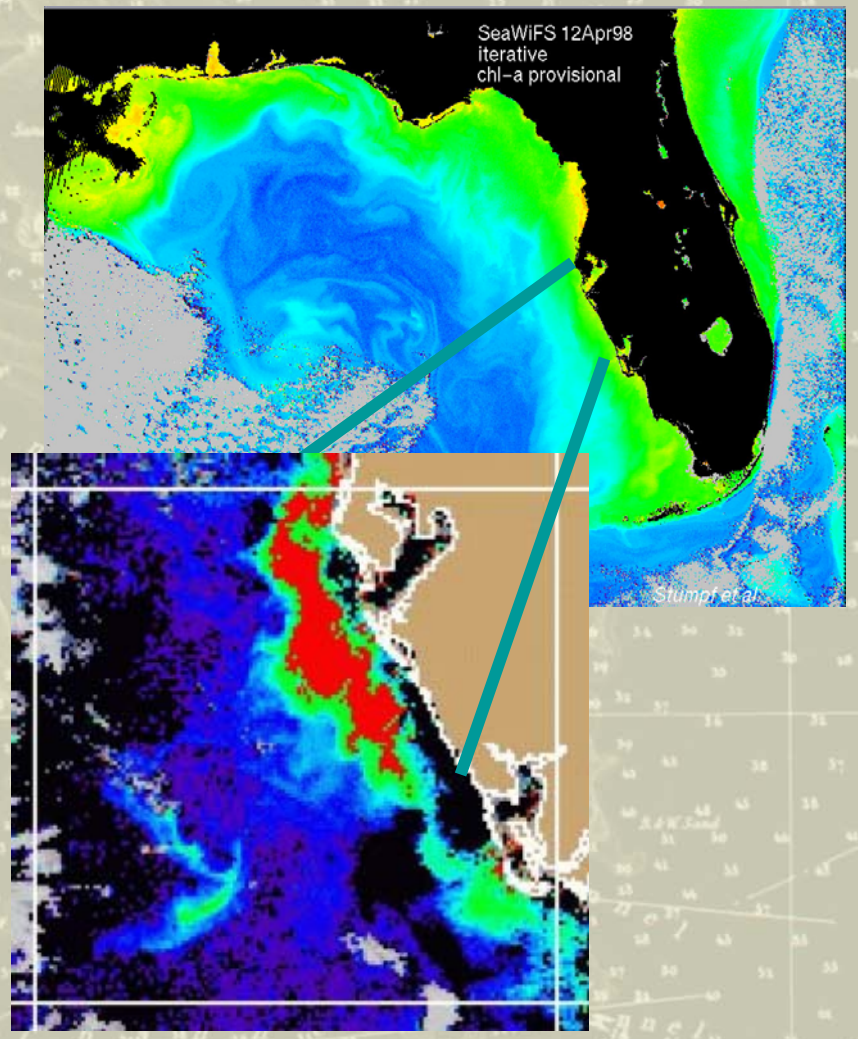
ENVIRONMENTAL PROTECTION
- clean up hazardous spills more quickly



ECOLOGICAL FORECASTING

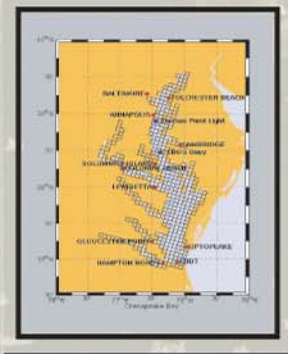
HAB LANDFALL FORECASTS

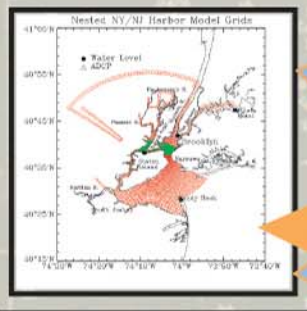
- Once a bloom is detected, combine
  - satellite tracking
  - in-situ sampling
  - biophysical models
- Provide trajectories and potential areas of landfall

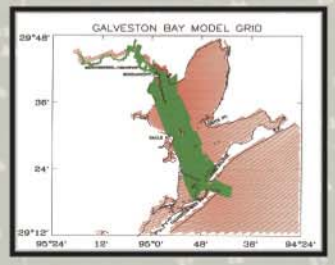


INDIVIDUAL-to-STANDARDIZED MODEL SYSTEM

individual model systems:



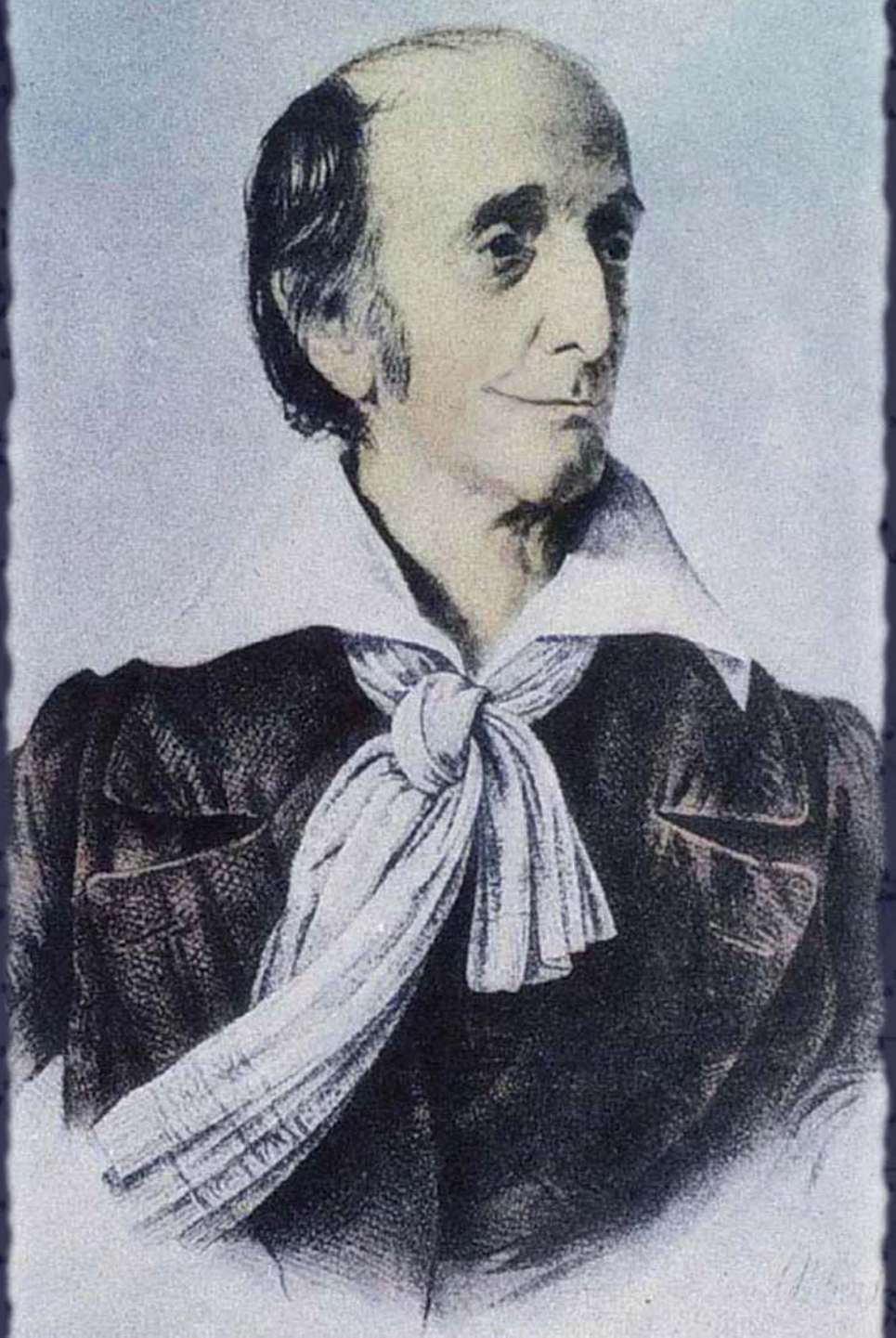




DATA INGEST → QA/QC → OPERATIONAL MODELS

ANY MODEL, ANY LOCATION

OPERATIONAL MODELS → QA/QC → PRODUCTS to USERS

TAILORED:

- Resolution
- Derived products
- Delivery mechanisms