TUBITAK
Marmara Research Center
Environment & Cleaner Production Institute

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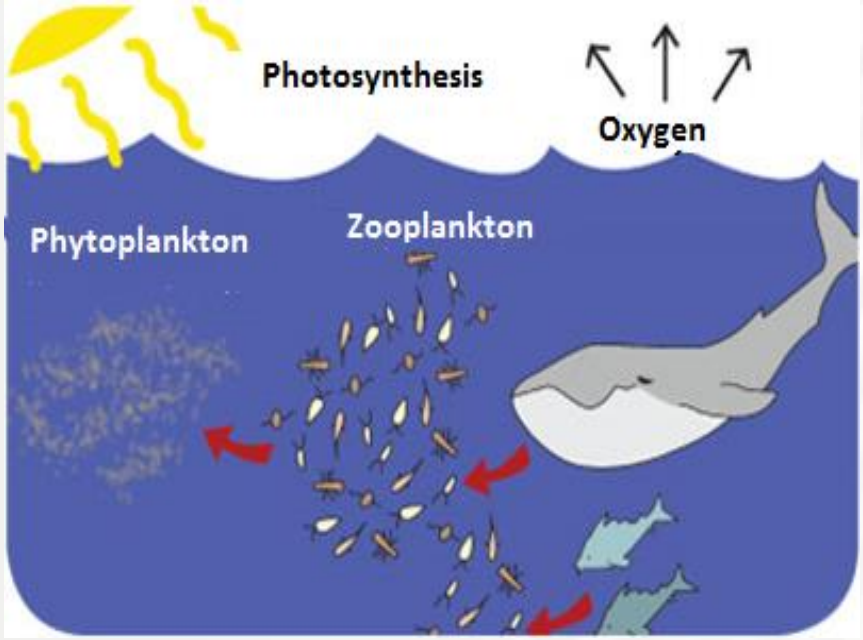
STRATEGIC BUSINESS UNITS

TÜBİTAK

Marine and Inland waters– Study areas

- Coastal and gulf ecosystem studies
- Marine environment and ecosystem health
- Monitoring coastal and/or inland waters
- Integrated management of coastal areas
- Evaluation of environmental impacts due to activities in seawaters
- Emergency response plans
- Ballast water management



Selected Government-Funded Projects

Identification of hazardous compounds in inland and transition waters and ecological coastal dynamics (KIYITEMA completed)

Funding: Ministry of Forestry and Water Affairs

Identification of swimming water profiles for Turkish Coasts (YUTAY completed)

Funding : Ministry of Environment and Urbanization

Integrated Pollution Monitoring & Assessment of Turkish Seas (ongoing)

Funding: Ministry of Environment and Urbanization

Providing Standardization in Marine Monitoring (ongoing)

Funding: Ministry of Environment and Urbanization

Dredging Applications and Environmental Management of Dredged Material in Turkey (ongoing)

Funding: TUBITAK

Monitoring the water/sediment quality of sea of Marmara and Golden Horn, and biodiversity of GoldenHorn (ongoing)

Funding: Istanbul Water and Sewerage Administration, Istanbul Metropolitan Municipality

Monitoring of Water Quality and Terrestrial Inputs in Gulf of Izmit and Development of Recommendations for Prevention of Pollution (ongoing)

Funding: Kocaeli Municipality

Center of Excellence for National Marine Research (ongoing)

Funding: Ministry of Development

The Project for Enhancing the Underwater Research Infrastructure of R/V TUBITAK Marmara Research Vessel (ongoing)

Funding: Internal

Feasibility Study for Development of Flow and Pollutant Dissemination Model for Turkish Seas (ongoing)

Funding: Ministry of Transportaion, Marine and Communication

EU projects

EUROFLEETS-2: New operational steps towards an alliance of European research fleets (ongoing)

Micro B3: Marine Microbial Biodiversity, Bioinformatics and Biotechnology (ongoing)

SeaDataNet-2: Pan-European Infrastructure for Ocean and Marine Data Management (completed)

SPICOSA-Science and Policy Integration for Coastal System Assessment (completed)

IRIS-SES-Integrated Regional Monitoring Implementation Strategy in the South European Seas (completed)

HotBlackSea-Integrated Hotspots Management and Saving teh Living Black Sea Ecosystem (completed)

R/V TÜBİTAK MARMARA (July 2013)

TÜBİTAK MARMARA Research Vessel (R/V) came into service to support both national and international Marine Research in Turkish seas.

The ship has been built with the support of TUBITAK & Ministry of Development

- Research on Oceanography and Climate&Atmospheric Sciences
- Environmental Monitoring
- Scientific Diving & Underwater Photography & Video Casts
- Habitat Mapping & Biodiversity Studies

Vessel at a Glance

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Oceanographic Winches

4'' Multi Purpose USBL Pole

Meteorological Measurements

Sattellite Communication

Onboard Data Network

A Frame & Boom Crane

CTD & Carrousel Water Sampler

SSS/SBP Towing

ROV Deployment

Seefloor / Corer Sampling

Sea Surface Sampling

Stern Platform

Hull Mounted

MBES
50 kHz
180kHz

Single Beam Echosounder

ADCP
75 kHz
150kHz

11 Researcher
12 Crew

12 Days Cruise
2500 Nm Range

Onboard Analyses

Work Deck

Main Machinery & Propulsion Systems

DP1 Dynamic Positioning

Incubation Room

Wet & Dry Biology Lab

Research Vessel Capacity

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Regional Class Research Vessel

- 41.2 m Length (Overall Length)
- 499 GRT (Closed Space Volume)

Class Notation: Turkish Loyd +1A5 ICE-B RESEARCH VESSEL +M, AUT, DP1, UNRESTRICTED

Speed & Range

- 10 kts Service Speed (Economy)
- 14 kts Max Speed
- 2500 Nm Max Range

Manning

- UNMANNED Full Automated Engine Room
- 12 Crew & upto 12 Researchers
- 12 Days Crusing

Working Environment For Long Scientific Cruises

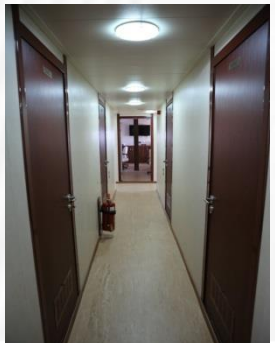
TÜBİTAK

Saloons & Meeting Rooms

- 1 Mess Room for Scientists & Officers
- 1 General Purpose Dining Room
- 1 Meeting Room for Training Purposes
- PC Lab & LAN & Wireless Access

Accomodation up to 12 Scientists

- 3 VIP Rooms
- 4 Double Rooms
- Online Cruise Info Monitors



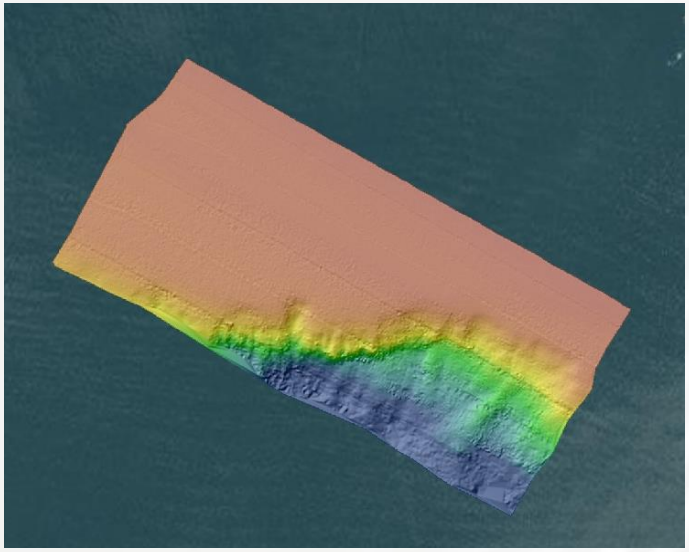
MBES MultiBeam Echosounder

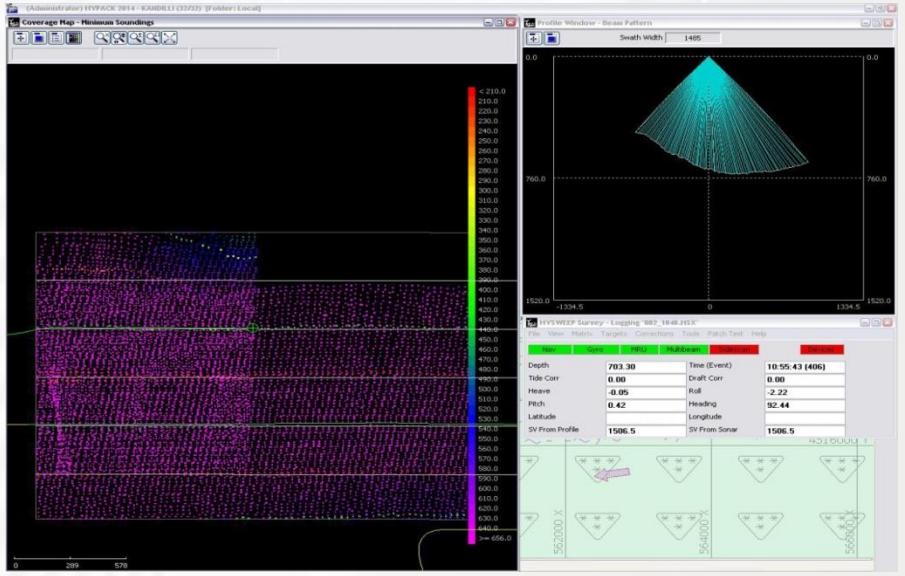
TÜBİTAK

Hull Mounted Multibeam Echosounder (MBES)

- 50 kHz (up to 3000 m Depth)
- 180 kHz (up to 500 m Depth)

Bathymetry (Hydrographic Mapping)





Hull Mounted Singlebeam Echosounder (SB)

- 12 kHz (up to 10000 m Depth)
- 200 kHz (up to 500 m Depth)

ADCP Acoustic Doppler Current Profiler

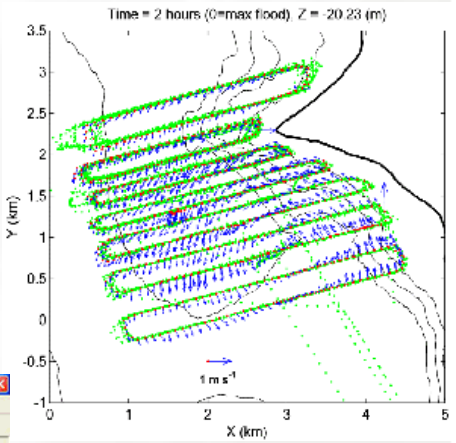
TÜBİTAK

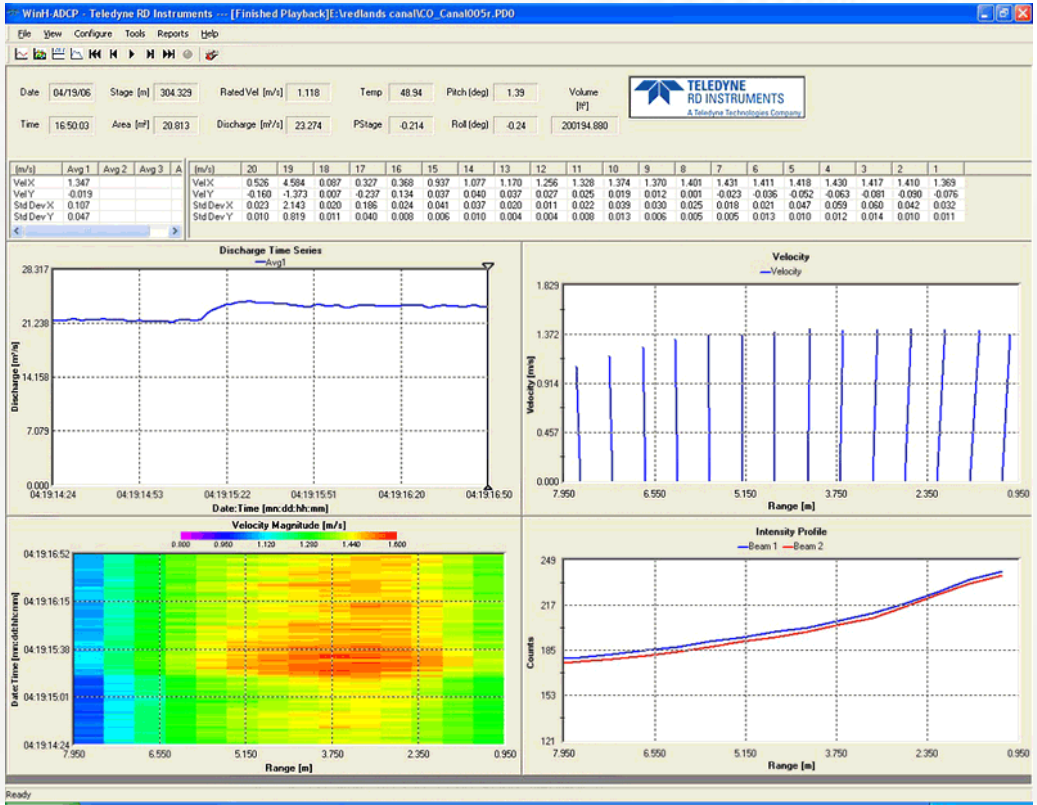
Hull Mounted ADCP Current Profiler

- 75 kHz (up to 300 m Depth)
- 150 kHz (up to 150 m Depth)

Current Profiling & Measurement

Oceanographic Modelling





Onboard Analyses

Wet & Biological Lab

- Water Quality Analyses
- Chemical Analyses

Dry Lab & Onboard Autoanalyser

- Florimeter
- Chemical Analyses

Incubation Room

- SeaWater Supplied Climatic Incubation Room
- Dual Use as ROV Control Room

Main Machinery & Propulsion System

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Main Engine & Propulsion System

- 2 x 1040 kW, 1650 rpm Marine Diesel
- 2 x 1750 mm dia, CPP Propellers

Hull Machinery & Power Generation

- 2 x 294 kW diesel Generator (Main)
- 1 x 108 kW diesel Generator (Harbour / Emergency)
  - Single Generator Operation in Transit Cruises
  - Powerful Enough for Field Surveys

Dynamic Positioning System (DP1)

- 95 kW Bow and 95 kW Stern Thrusters
- Kongsberg K-Pos & C-Joy Operator Consoles

Underwater Positioning System

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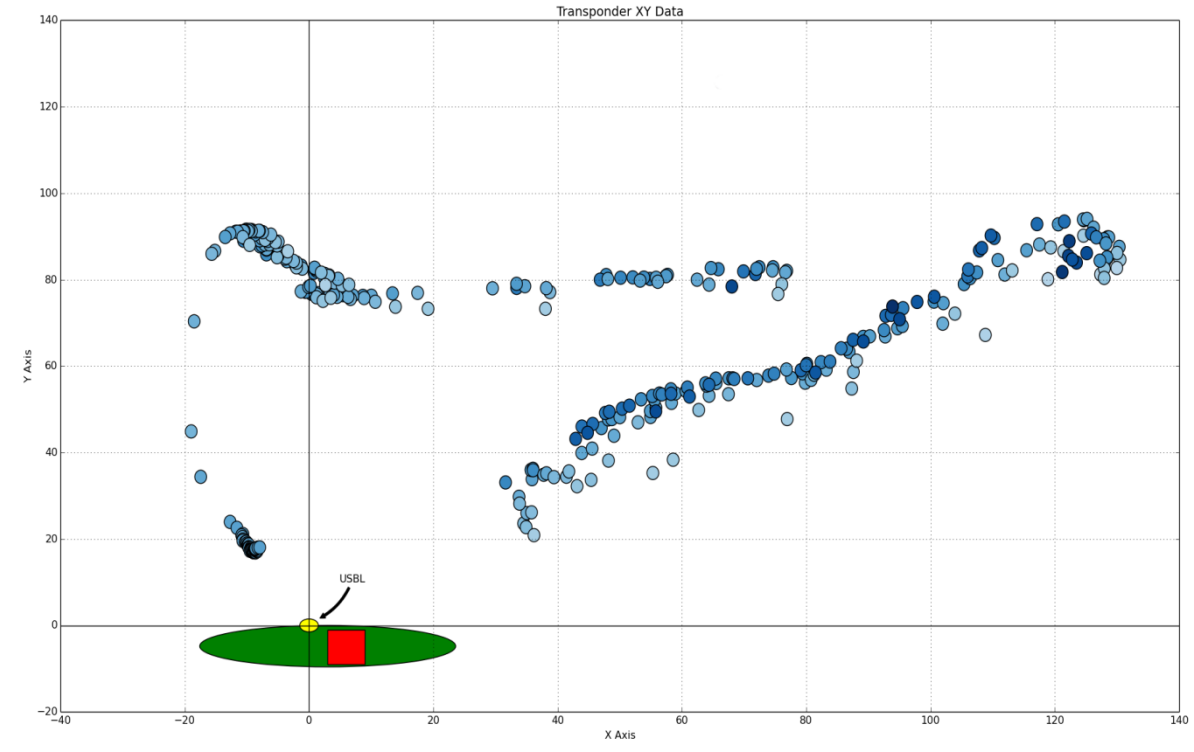
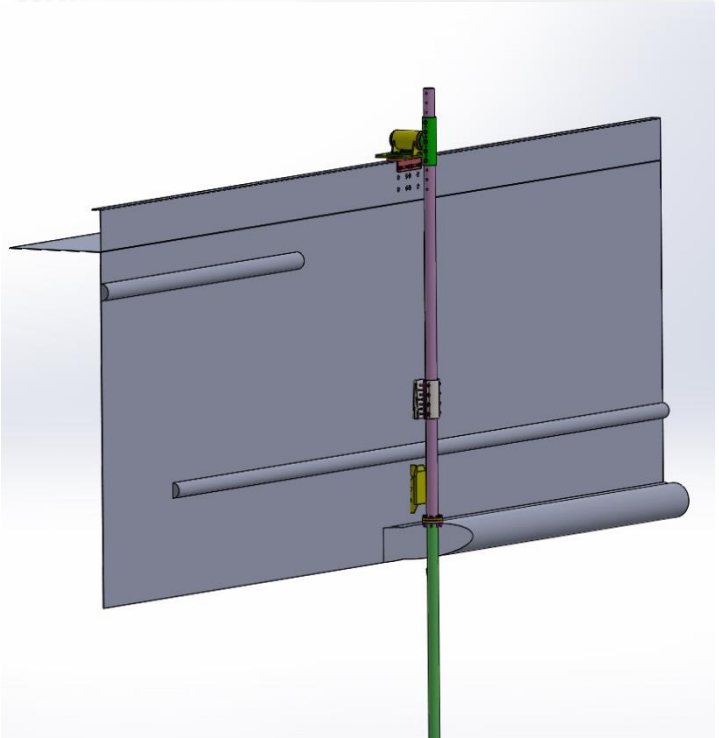
USBL Underwater Positioning System (UltraShort BaseLine)

- Relative position & acoustic tracking of multiple underwater targets up to 1000m depth (ship to underwater targets and ship to surface boat for diving purposes)

- 4'' Multipurpose Pole for USBL Transponder





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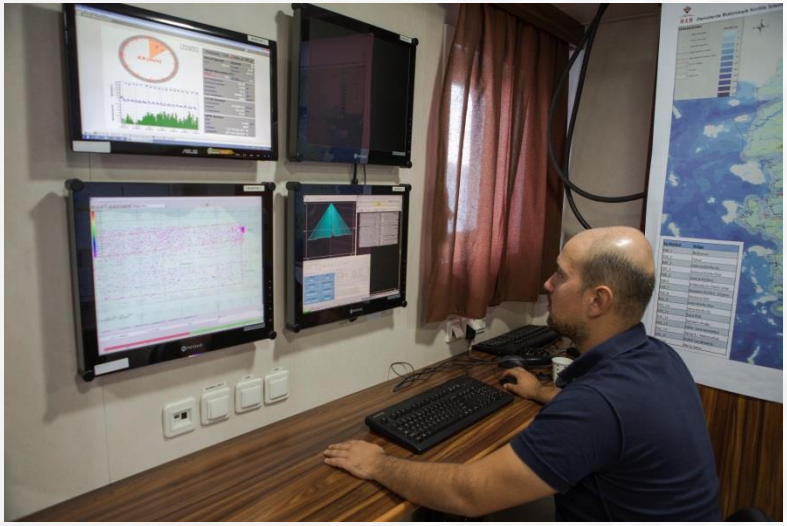
Meteorological Measurements

- 6.5m Mast Height with Aluminium Construction
- Two Sided / Angled Mast to maintain Free Span Distance Between Sensors
- Dedicated sensor sets for atmospheric parameters
- Wind Speed & Direction
- UV & Radiation
- Humidity, Surface Pressure



Work Deck & Portable Equipment

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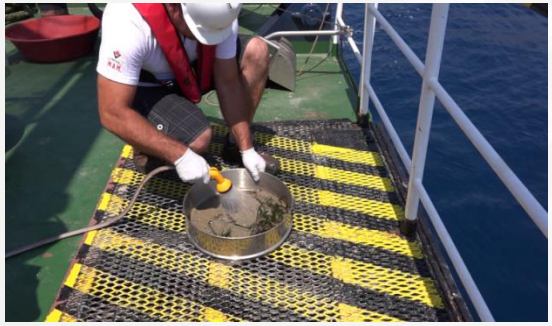
Work Deck Structures & Facilities

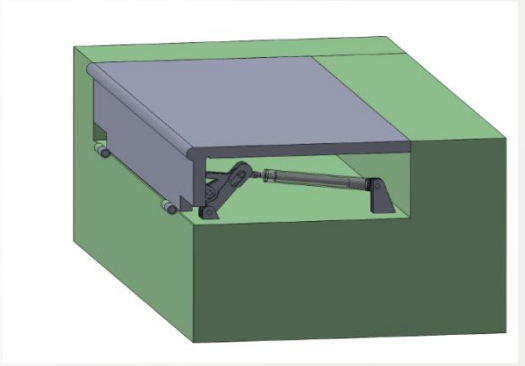
- 8m x 8m (64 m^2) Effective Free Space / Work Deck Area
- Container Fittings / Deck Sockets Matrix (5’ & 10’ & 15’ & 20’ Containers)
- 1m Freeboard from Sea Surface
- 6m Corridor Underdeck for a Reserved Working Space
- Gridded Platform Construction
  - Easy Drainage Area for Wet Works Onboard



Step Deck & Stern Platform

Step Deck & Stern Platform

- Increased Sea Surface Accessability
  - Operational Effectiveness for Boat Support
- Scientific Diving Platform
  - Easy Deployment & Recovery with Safety Support



Stern Platform Capacity

- Platform Dimensions
  - Length: 3.6m Width: 1.2m Depth: 0.5m
- Integrated Hydraulic Power
  - Stroke Length : 0.47m
- Sweep Angle
  - 180 Degree Rotation

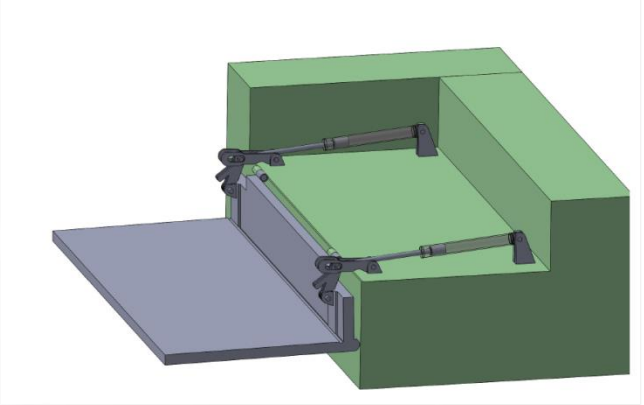


Photo & CAD model from Manufacturer's Reference (www.datahidrolik.com)

Diving & Biodiversity Studies

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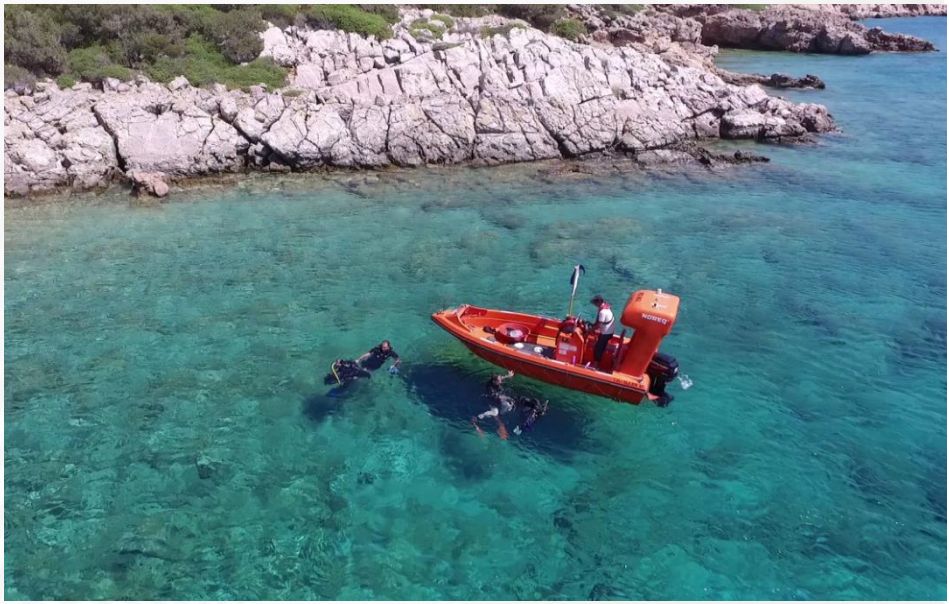
Boat Assisted Scientific Diving / Biodiversity Studies

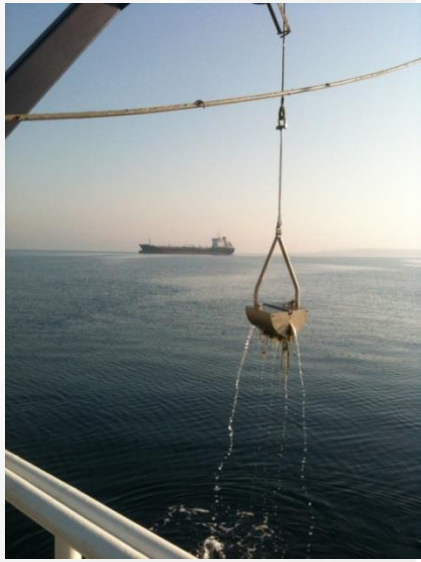
- Quick & Safer Diver Delivery
- Acoustic Communication with
  - Diver to Boat & Diver to Ship
- Underwater Photography & Videocasts
  - 16 000 Lumen Lighting
- DropCam
  - 100m Depth



Seafloor & Sea Surface Sampling

Sediment Sampling (Grab Corer)

- Sediment sampling with Grap Corer

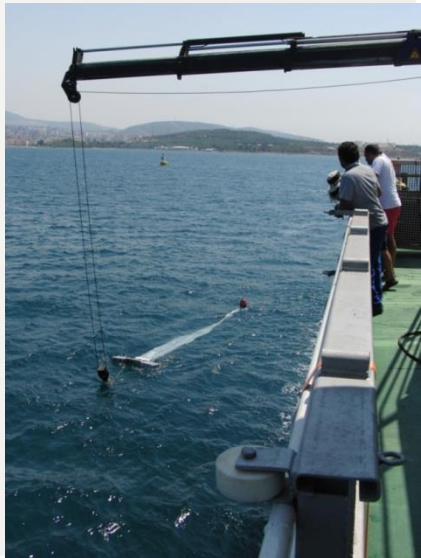


Sediment Sampling (Gravity Corer) Planned

- Sediment sampling up to 1000m depth with Gravity Corer

Sea Surface Sampling (A-Frame & Palfinger)

- Sea Surface sampling of phytoplankton, zooplankton, micro plastics, PAH etc.
- Custom Nets for sea surface deployment



Remotely Operated Vehicle

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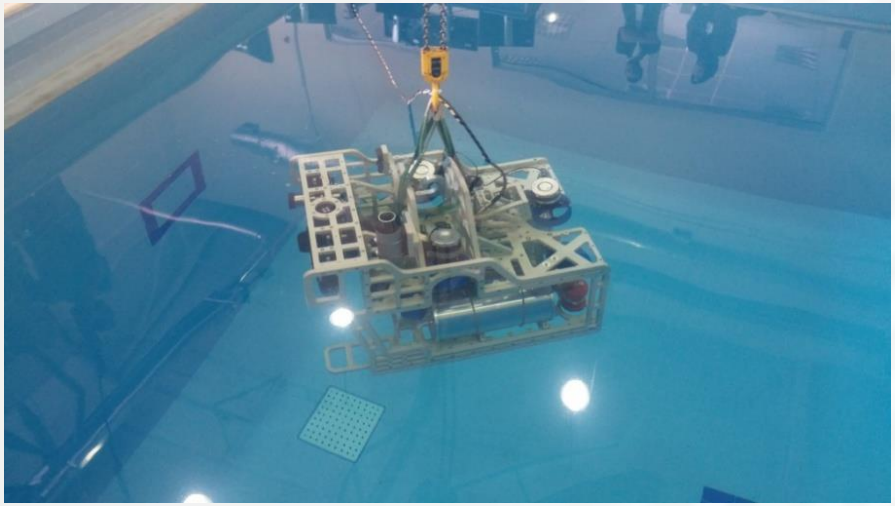
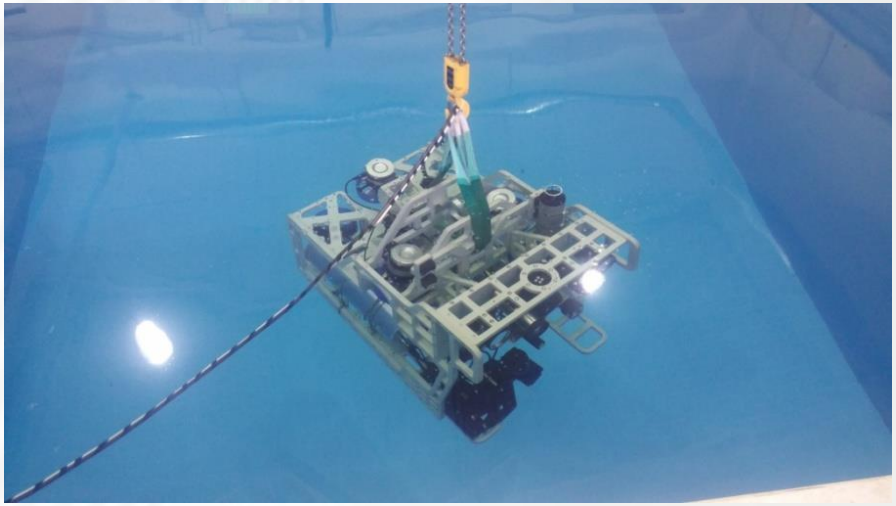
Observation Class ROV

- 1000m rated observation class ROV
- Lab Tests Completed
- Sea Trials planned for September 2016





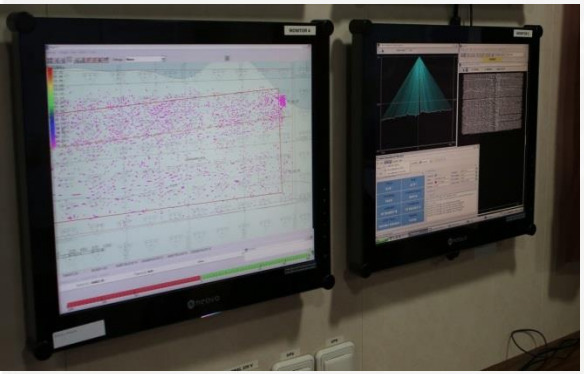
SSS (Side Scan Sonar) & SBP (Sub-Bottom Profiler)

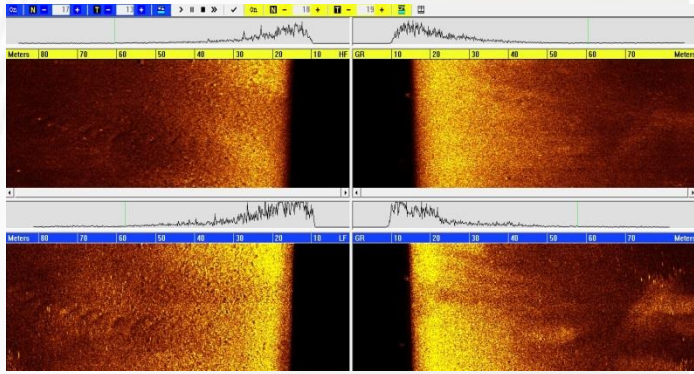
TÜBİTAK

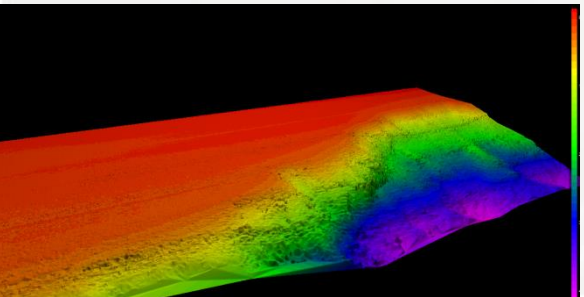
Combined Side Scan Sonar & Sub Bottom Profiler

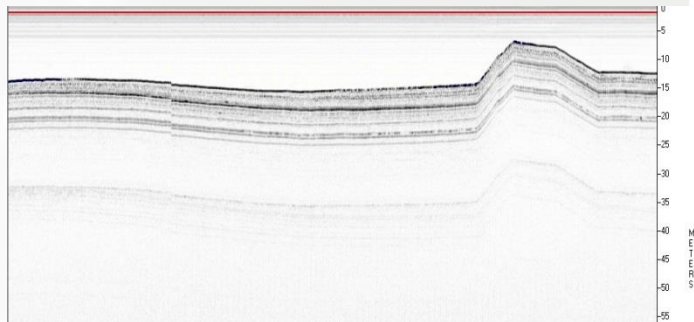
- 1000 m towing Depth with 3000m coaxial cable
- 2-16 kHz frequency Sub Bottom Profiler
- 100 / 400 kHz frequency Side Scan Sonar

Geophysical Surveys









Oceanographic Winches (Electric)

TÜBİTAK

Winch #1 Coaxial Cable

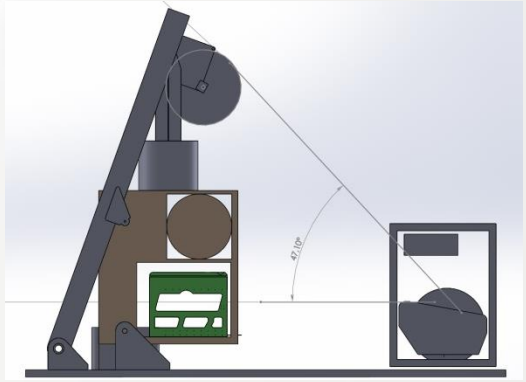
- 3000m Coax 8.2mm Outer Diameter Cable
  - Dual Use of CTD & SSS/SBP Towfish

Winch #2 Steel Wire

- 2000m 10mm OD Outer Diameter Steel Wire
  - SeaFloor Sampling
    - Grab
    - Corer
  - Sea Surface Sampling
    - Custom Nets

Winch #3 Umbilical

- 1000m 21mm Outer Dimater OD
  - ROV Deployment (Sea Trials Planned for September 2016)
  - Towed Instruments via Exchangable Drum



A Frame & Deck Crane Capacity

TÜBİTAK

5 Tons SWL A-Frame Capacity

- 1 x Sheave Wheel for 8.2mm Coax Cable (12 kN SWL)
- 1 x Sheave Wheel for 10mm Steel Wire (12 kN SWL)
- 1 x Sheave Wheel for 21mm ROV Umbilical (50 kN SWL)

Multi Purpose Tow

- SSS/SBP Towfish
- Magnetometer / Gradiometer
- Various Sampling Nets (Mid-Water)

Flexibility & Outreach

- - 20 Degrees Inboard for Launching
- +40 Degrees Outboard for Deployment & Recovery

Knuckle Boom Crane (Palfinger)

- 3 Tons Capacity @ 10m Outreach
- Foldable Telescopic Crane

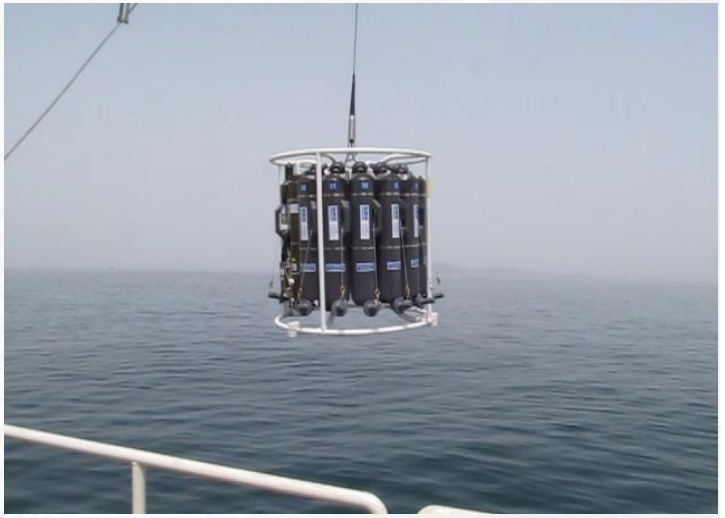
Water Quality & Onsite Measurements

TÜBİTAK

CTD & Water Sampling

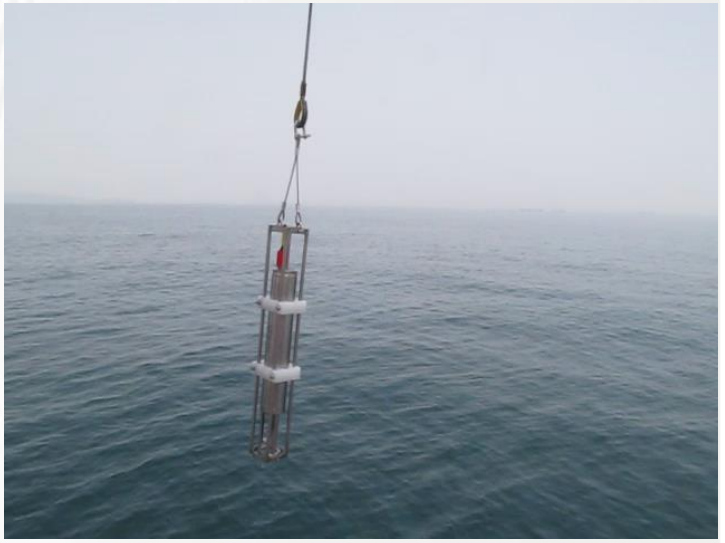
(3.000 m coaxial cable)

- With various sensor configuration
  - Conductivity , Temperature, Depth
  - pH & ORP
  - Flourimeter, PAR
  - Dissolved Oxygen (DO)
  - Transmissometer
  - 12 L x 12 water sampling capacity



SVP Sound Velocity Profiler

- Measurement of Sound Velocity vs Depth Profile
- Calibration of Multibeam Echosounder
- Quick Measurement of Temperature Gradients



Coastal & Sattellite Communication

TÜBİTAK

Coastal Communication (Limitless Access)

- High Capacity Use @ Harbours & Coastal Cruises (3G to LTE Technology)
- Depends on Land Based GPRS Signal Availability(~5 - 10Nm off the coast)

Sattellite Commnication (Messaging & Data Access)

- Dedicated SAT Line Integrated with LAN Network
- Thuraya Marine High Quality/Capacity Regional Access
- VOIP Sattellite Phone

Onboard Data Infrastructure

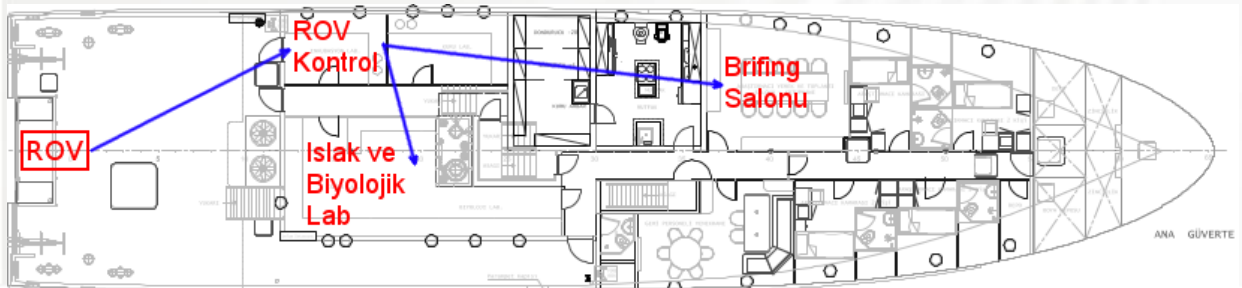
TÜBİTAK

Scientific Data Network

- 1 GBit Layer II 24 Port Switch
- Observation Camera System (4 Points)

Onboard Data Access / Distribution

- Scientific Data Network (LAN)
- Wireless Access Points (Labs & Work Decks etc.)
- Onboard Real Time Media Access for Underwater Observation



Survey Boats

Research & Survey Boats

- RV TUBITAK ANADOLU (17m)
- RV TUBITAK RUMELI (17m)
- TUBITAK MAM (6m)
- TUBITAK DIPTAR (3.3m Survey Catamaran)

Survey Boats Undertaking

- CTD Water Quality Analyses
- ADCP Current Profile Measurements
- Shallow Water Bathymetry Surveys

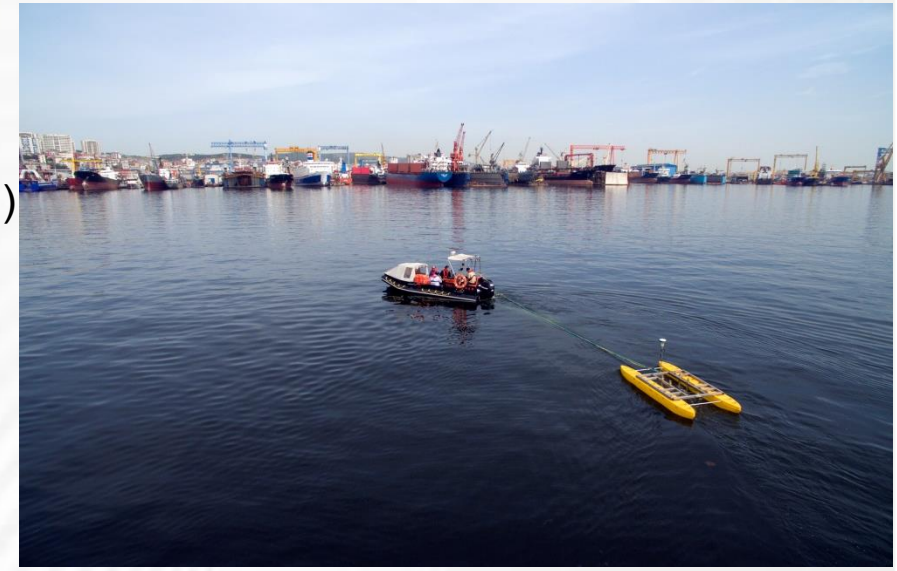
Shallow Water Survey

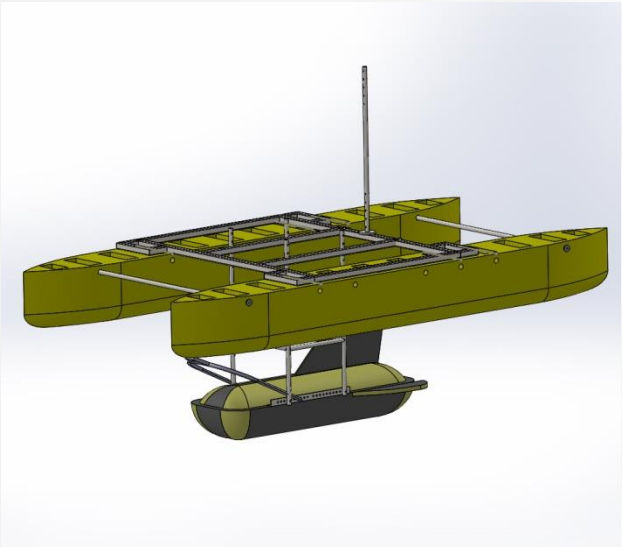
Shallow Water Survey

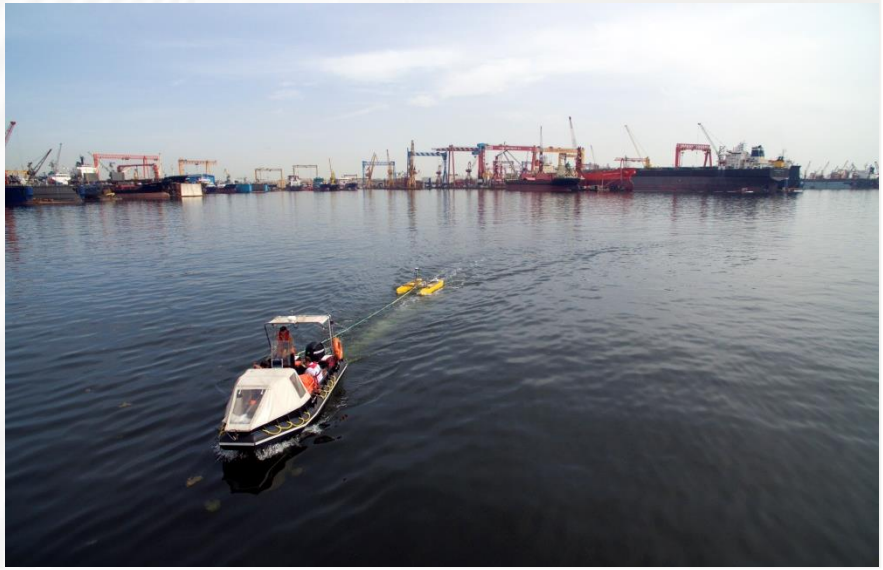
- TUBITAK MAM (6m)
- TUBITAK DIPTAR (3.3m Survey Catamaran)

Surveys Boat Configuration Adjustable

- From Design to Field
- Project Based Re-configuration
- Autonomy Available for Grid Surveys







Shallow Water Survey

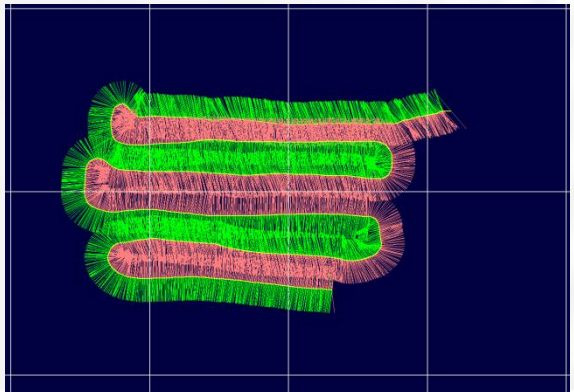
TÜBİTAK

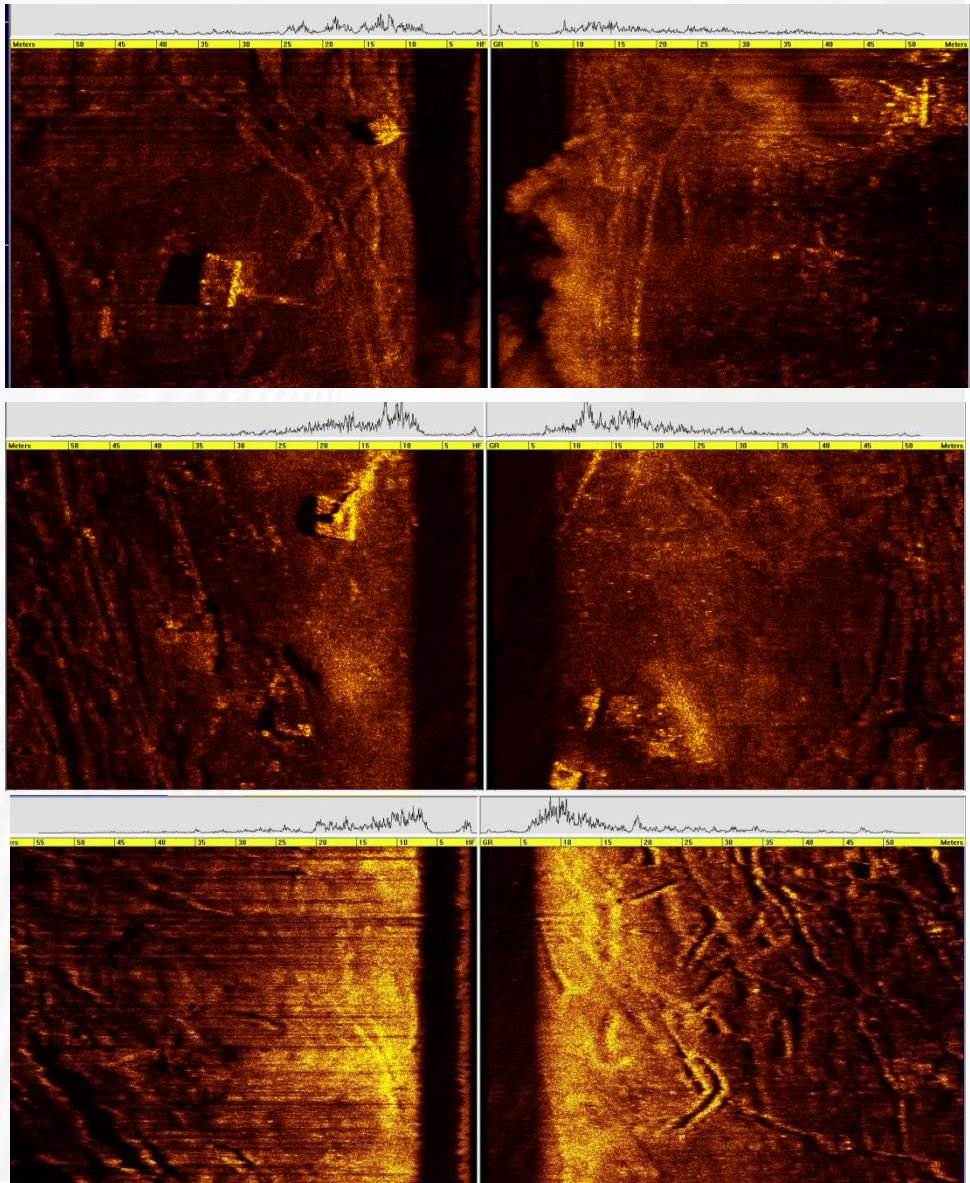
Side Scan Sonar

- TUBITAK DIPTAR (3.3m Survey Catamaran)
- Mooring Buoy Wreck
- Anchorage Bay Bottom Form

Survey Grids by Boat

- Mosaicing by GIS / HYPACK Support
- 2-3 kts Survey Speed





R/V TÜBİTAK MARMARA

THANK YOU…