

**r/v OCEANIA**



***Institute of Oceanology PAS Sopot***



The sailing research vessel OCEANIA was designed by Eng. Zygmunt Choreń, an accomplished designer of tall ships, and built in the Gdańsk Shipyard in 1985. The construction was carried out in close co-operation with and according to the instructions from the owner - the Institute of Oceanology PAS.

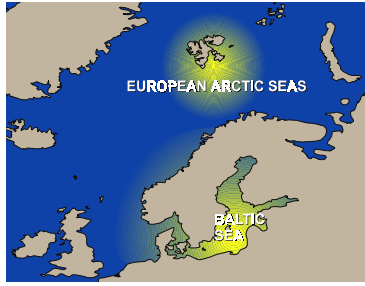


The Institute of Oceanology of the Polish Academy of Sciences is the largest Polish marine sciences centre for physics, chemistry, biology and ecology of the sea. Having a fifty-year history it has numerous achievements in research and a well-developed international co-operation. The main areas of interest include the Baltic Sea and oceanic regions such as northern and arctic seas.



Prior to building a research vessel a concept of a modern sailing ship (with hydraulically operated sails) was selected to provide services with maximum range (northern seas) and low costs of operation. Prof. Leonard Falkowski, a sea chemistry researcher, proposed the name for the ship.





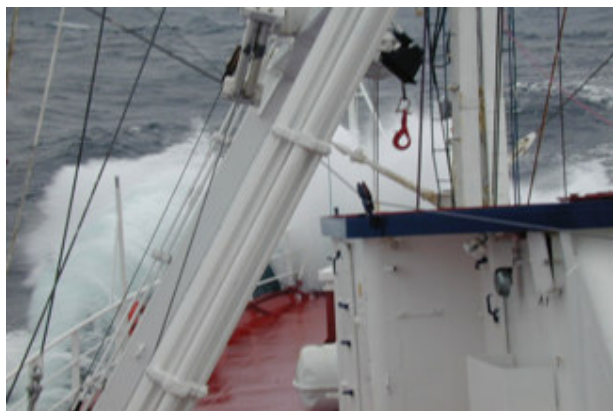
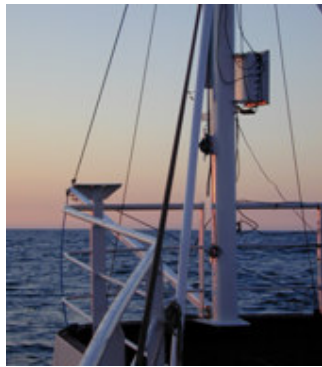
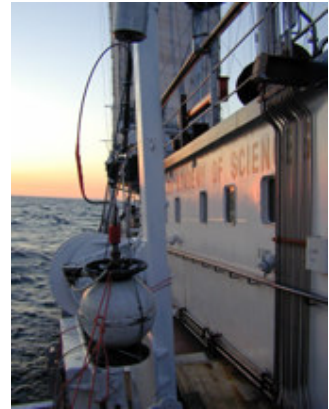
Each year OCEANIA spends 230 to 250 days at sea carrying out a two-month research expedition to northern seas and Spitsbergen (June-August) and a dozen of Baltic cruises. During those expeditions almost all of Institute's research topics and 13 international programs are realised.

Annually numerous scientists from domestic and foreign research centres take part in research at sea aboard r/v OCEANIA.



Exemplary international programs realised on board of R/V OCEANIA

- Baltic Experiment BALTEX
- Arctic-Subarctic Ocean Flux ASOF-N
- Biodiversity and Fluxes in Arctic Glaciated Fjords BIODAFF
- Diapycnal Mixing DIAMIX
- Baltic Operational Oceanographic System BOOS



Many significant publications and doctoral papers have been written as a result of research conducted during research cruises on OCEANIA.



## MAIN RESEARCH ABOARD r/v OCEANIA

### HYDRODYNAMICS

- Structure and dynamics of the Westspitsbergen Current
- Water, heat, and salt transport with the Atlantic Water to the Nordic Seas and the Arctic Ocean
- Transport of deep / inflow waters inside the Baltic Sea and its role in Baltic Sea Ecosystem
- Water exchange among deep basins of the Baltic Sea
- Exchange of mass and energy between sea and atmosphere

### OPTICS

- Optical processes, transport and exchange of solar radiation in the sea-atmosphere system
- Utilisation of the solar light in photosynthesis
- Upwelling radiance from the water body through the sea surface (aerosols and contaminants)

### ACOUSTICS

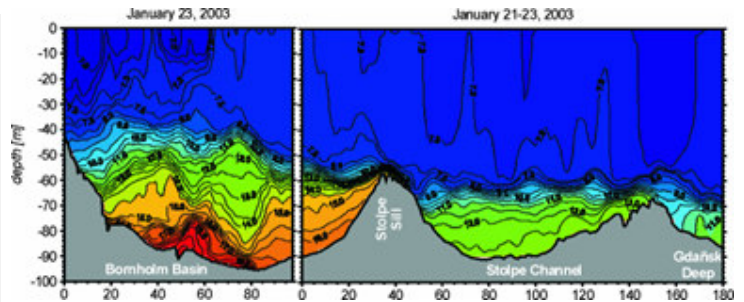
- Investigation of acoustic bottom properties
- State of sea ecosystems using acoustic methods
- Determination of gas bubble concentration (in water column and seafloor)
- Acoustic backscatter in seawater on the basis of ADCP data

### CHEMISTRY

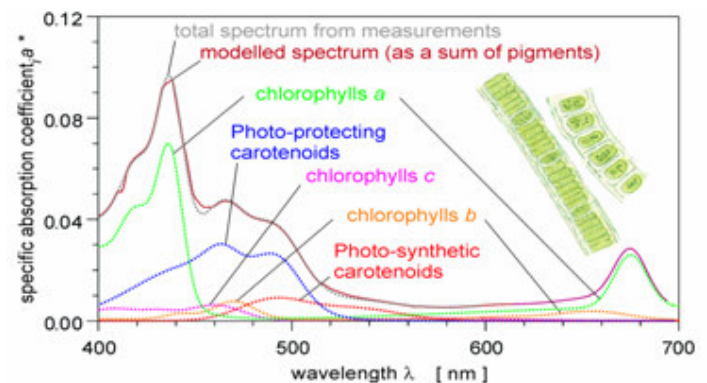
- Migration of natural and anthropogenic chemical substances
- Presence of organic compounds – markers of different processes in the sea
- Sedimentation and scavenging processes
- Geochemistry of heavy metals and organic substances

### ECOLOGY & BIOLOGY

- Role of biodiversity in the functioning of coastal ecosystems
- Biochemical processes in the sea environment



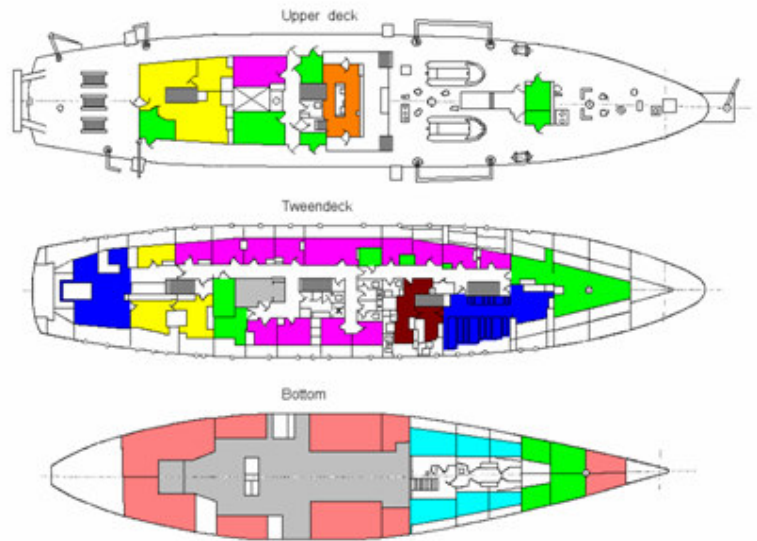
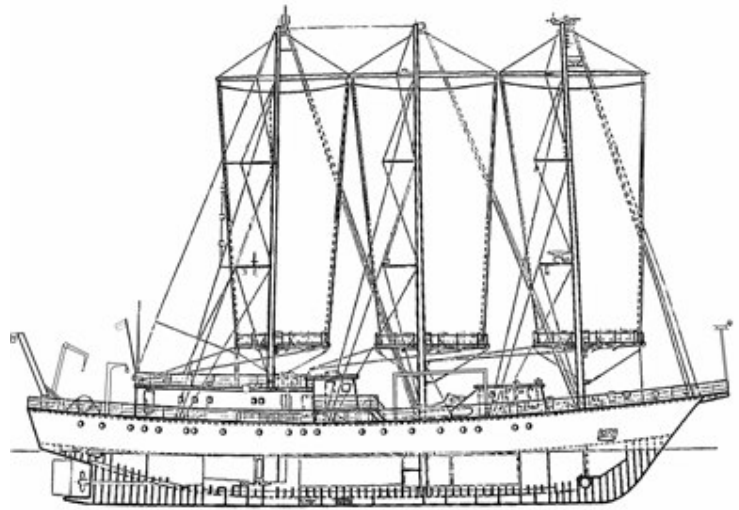
Changes of salinity [psu] distributions along an axis of the deep basins (Bornholm Basin - Stolpe Channel - Gdańsk Deep) after the main inflow in January 2003



Specific light absorption by pigments in photosynthetic apparatus of phytoplankton cells

## GENERAL INFORMATION

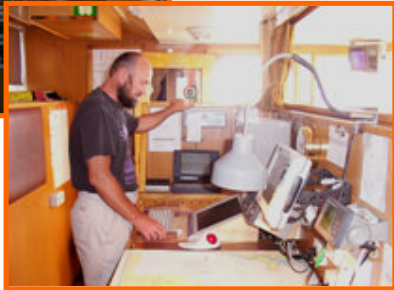
**Name:** r/v OCEANIA  
**Constructor:** Gdańsk Shipyard 1985  
**Owner/Operator:** Polish Academy of Sciences / Institute of Oceanology in Sopot  
  
**Harbour:** Gdańsk  
**Call sign:** SQOC  
**Length/beam/draft:** 48.9 m/9.0 m/3.8 m  
**Displacement:** 370 T  
**Engine:** Diesel, 310 HP  
**Bow thruster:** 70 HP  
**Masts:** 3, each 32 m high  
**Sails:** 430 m<sup>2</sup>, hydraulically operated  
**Cruising speed:** 7 knots  
**Crew:** 13  
**Scientists:** 14  
**Endurance:** 1 month  
**Cruising range:** Unlimited (except the Arctic area in winter)



- |                  |               |              |
|------------------|---------------|--------------|
| Bridge           | Cabins        | Machine room |
| Technical spaces | Mess / lounge | Tanks        |
| Laboratories     | Galley        | Cool stores  |

## LIVING AND WORKING CONDITIONS

Double cabins  
 Lounge with a library, TV and radio, bar  
 Air conditioning and central heating system  
 Laboratories (wet, isotope, analytical, acquisition, computer)  
 16 PC's in a LAN network



For research convenience OCEANIA has been furnished with modern laboratories, a system of A-frames, outboard platforms and hydraulic masts with winches (8 for depths of 300-5000m), an Ethernet network (16 data acquisition and processing stations) and a stabilised current electric network.



## TECHNICAL EQUIPMENT

### NAVIGATION

- DGPS – ADUS THALES NAVIGATION
- Two radars – FURUNO
- Gyrocompass – PLATH
- Navy Fisher – TRANSAS
- Autopilot - PLATH

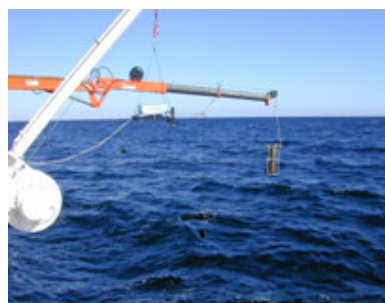
### COMMUNICATION

- Radio station – SCANTI
- Two FM stations – SAILOR
- Inmarsat C (e-mail gate to Internet)
- GSM (+48 601 66 20 30)

### DECK EQUIPMENT

- Rotating stern A-frame (3 tons)
- Side A-frames and probing masts
- Two RAPP-HYDEMA winches for deep-water use (5000m and 2000m cable wires  $\phi 6$ )
- Two winches for shallow-water use (300m cable wires each  $\phi 6$ )
- Two winches for nets (500m  $\phi 3$ , 300m  $\phi 5$ )
- Dragging winch (2000m  $\phi 10$ )
- Hydraulic crane (2 tons)
- Meteo station OBSERVER
- Two motor dinghies

OCEANIA is very brave at sea. Its modern equipment allows it to sail in any conditions within an unlimited range and an endurance of 30 days.



R/V OCEANIA has been equipped in the most modern research equipment from renowned manufacturers, such as STD probes with a bathymetric rosette and a batfish system for salinity and sea water structure research at different depths, current meters (including a ship ADCP and an ADCP lowered to various depths on cable), spectral light and sea water optical parameters analysers, aerosol analysers (including lidars), scientific echo sounders and sonars, samplers for water, zoo- and phytoplankton, sediments and geological probes.



## RESEARCH EQUIPMENT

### HYDROGRAPHY

- CTD SEA-BIRD 911 plus
- CTD SEA-BIRD SBE 36
- CTD 606+ VALEPORT
- Current Meter 308 VALEPORT
- Current Meter 808 VALEPORT
- ADCP Current Profiler RD Instruments
- Batfish system

### OPTICS

- A set of pyranometers KIPP&ZONEN and EPPLEY
- LABORATORY
- Absorption and Attenuation Meter AC9 WET LABS
- Marine Spectroradiometer MER-2040 BIOSPHERICAL INSTRUMENTS INC.
- Ocean Colour Profiling System OCP-100 SETLANTIC
- Laboratory UV-VIS Spectroradiometer 4-100 UNICAM
- Submerged Fluorometer Pump-Probe ECOMONITOR

### AEROSOL

- Aerosol Particle Counter PARTICLE MEASURING SYSTEMS
- Aerosol Lidar FLS-12

### ACOUSTICS

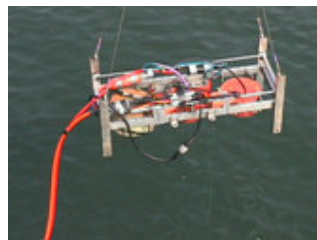
- Scientific Echosounder DT 5000 BioSonics
- Sidescan Sonar DF 1000 digital EDGER TECH
- System for non-linear bubble detection

### CHEMISTRY

- Carousel Water Sampler SEA-BIRD
- Nemo Sampler
- Box Corer
- Van Veen Bottom Sampler
- Oil Pollution Lidar FL-UV

### BIOLOGY

- Bongo Macroplankton Net
- WP2 Mesozooplankton
- Multi Plankton Sampler Midi HYDROBIOS
- Epibenthic Sledge



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