

RESEARCH VESSEL CORYSTES





CORYSTES

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RV Corystes

The RV Corystes is owned by the Agri-Food and Biosciences Institute (AFBI) and operates out of the Port of Belfast. The vessel has a year-round capability and enables AFBI to conduct an integrated marine science programme in Northern Ireland's coastal waters, the Irish Sea and adjacent sea areas.

The R.V. Corystes provides a versatile platform from which a wide range of fisheries and marine environmental research is undertaken. Fishery-independent surveys of fish stocks are conducted using specialised fishing gear and acoustic sensing techniques. Measurements of key environmental variables are made using over-the-side sampling equipment and instrumented buoys, which are deployed in the Irish Sea. The vessel is also fully equipped to conduct high resolution seabed mapping, using sophisticated acoustic sensors, with ground-truthing of marine habitats being achieved by deploying camera sleds or remotely operated vehicles (ROV).

AFBI undertakes the work onboard Corystes in direct support of the policy objectives of the Department of Agriculture and Rural Development (DARDNI) fishery customer; together with those of a wide range of other customers, including Department of the Environment (DOENI), local authorities and the Department for Environment Food and Rural Affairs (DEFRA). Research is also carried out on a range of marine science projects funded under the European Fisheries Fund (EFF) and INTERREG, frequently involving collaboration with partner institutes in Europe and elsewhere. The integrated marine science programme delivered by RV Corystes directly supports the key DARD policy objective of sustainability of Irish Sea fisheries and is contributing to the development of an ecosystem approach to fisheries management, as required by the European Commission. The comprehensive data on fish stocks and the marine environment provided by RV Corystes also provides AFBI with the scientific knowledge needed for successful future fisheries and marine ecosystem management.

RV Corystes is available for commercial third-party hire. Full technical specifications are available upon request.

Work Overview



Marine Fisheries Surveys

Using various types of trawl gear, information is obtained on the distribution, size and age composition of fish, queenies, scallops and Nephrops. The surveys provide time series of relative indices of abundance (biomass trends) for important commercial stocks in the Irish Sea. The indices for young fish are particularly important for making short-term forecasts of abundance and catches. The indices are incorporated in the annual assessments of the Irish Sea fish stocks carried out by the International Council for the Exploration of the Sea (ICES), which provides scientific advice for managing the fisheries within the EU Common Fishery Policy. The surveys also provide a source of samples for ancillary projects including studies on changes in reproductive potential, feeding, genetics, parasite loading and routine contaminant monitoring in fish.

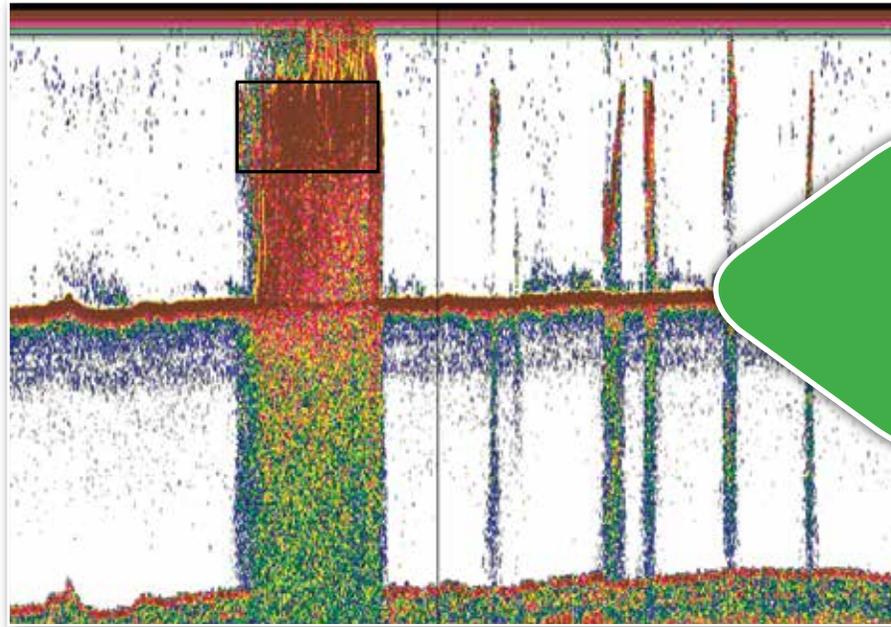


Acoustic surveys

The RV Corystes is equipped with modern acoustic echosounders and sonar fish finding equipment. A survey of herring and sprat is carried out annually during autumn, using an echosounder to detect fish shoals.

Estimates of the distribution, abundance and population structure of herring and sprat in the Irish Sea are obtained by echo-integration and targeted midwater trawling. The survey is most intensive around the Isle of Man giving good coverage of the main areas where adult herring are found in autumn, the main herring spawning period in the Irish Sea.

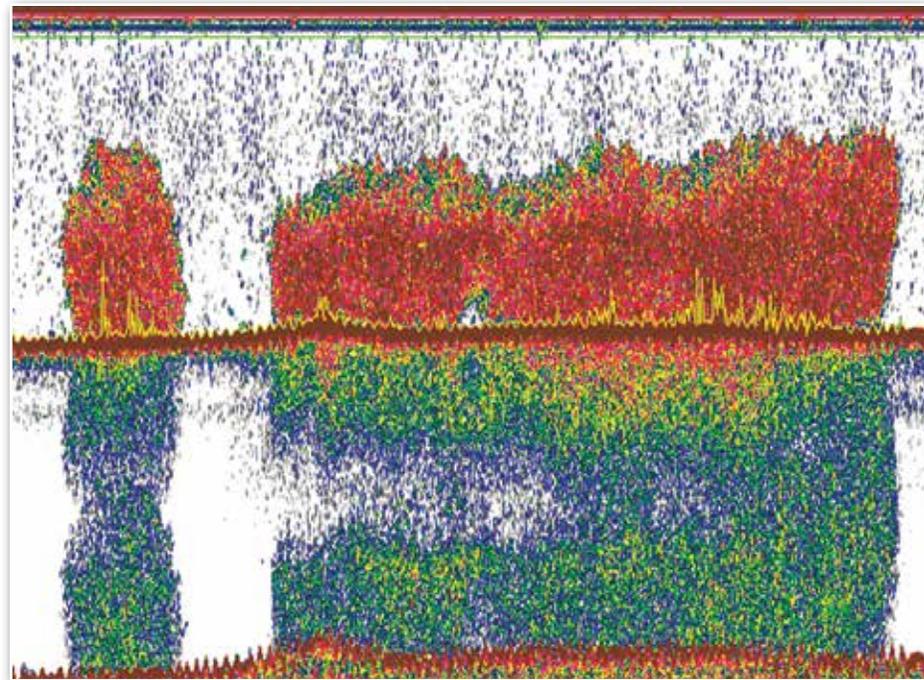
The survey provides a time series of estimates of abundance for herring and sprat stocks in the Irish Sea, which are incorporated in the annual assessment of the Irish Sea herring stock carried out by ICES. The survey series has also provided a source of samples for fundamental studies on herring stock dynamics. Data on the distribution and abundance of seabirds and sea mammals are also gathered periodically.



Examples of Herring marks to east of Isle of Man.

Estimated biomass of herring in Black Box ~ 36,000 t.

Brown line midway down is the seabed with echo artifact below



Plankton surveys

Using a high speed plankton sampler, the early life history stages of fish (eggs and larvae) and crustacea are sampled during the spawning periods. The data gathered during these surveys provide estimates of spawning biomass for key commercial species, location of spawning grounds and trends in spawning biomass. Used in conjunction with traditional trawl and acoustic surveys, AFBI is able to provide comprehensive estimates on the status of commercially exploited fish stocks such as herring and cod. The results of this work have been used to assess the effectiveness of the cod recovery programme in the Irish Sea, in collaboration with other EU marine institutes. Data collected from these surveys also provide opportunities to investigate the effects of environmental factors on fish recruitment.





Underwater TV surveys

AFBI and the Marine Institute (Republic of Ireland) jointly carry out an annual underwater television (UWTV) survey of the Nephrops grounds in the Irish Sea. This technique is based upon the knowledge that Nephrops live in burrows of a characteristic shape, which they build in the bottom sediment.

An underwater TV camera is mounted on an aluminium sled towed astern of the vessel over a grid of stations spaced approximately 3.5 nautical miles apart. Nephrops burrows are counted both at the time of recording and by experienced observers after the survey. Counts are converted into densities using information on the field of view of the camera and length of the tow. In estimating total stock abundance, burrow occupancy is assumed to be 100% as it is known that unoccupied burrows quickly collapse and cannot be seen. Burrow densities in the Irish Sea are typically higher than the west of Scotland and North Sea where similar surveys have been performed. Data from UWTV surveys are disseminated through the ICES forum to provide a scientific basis for Nephrops stock management.

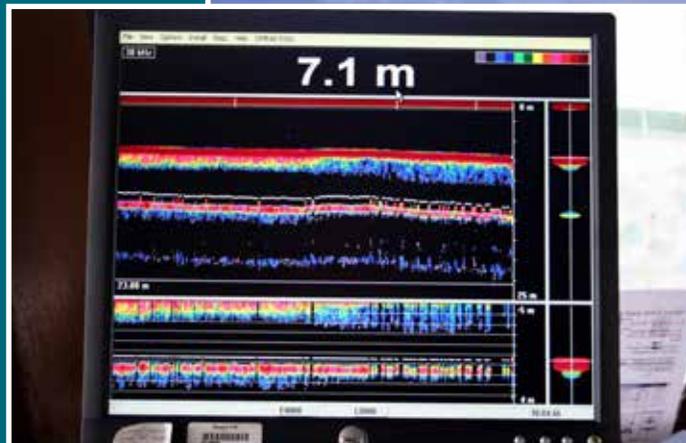
A similar survey technique is now also used to estimate the abundance of queen scallops off Northern Ireland's coasts.

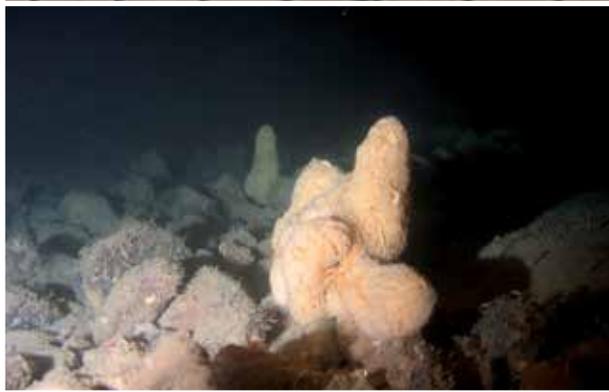
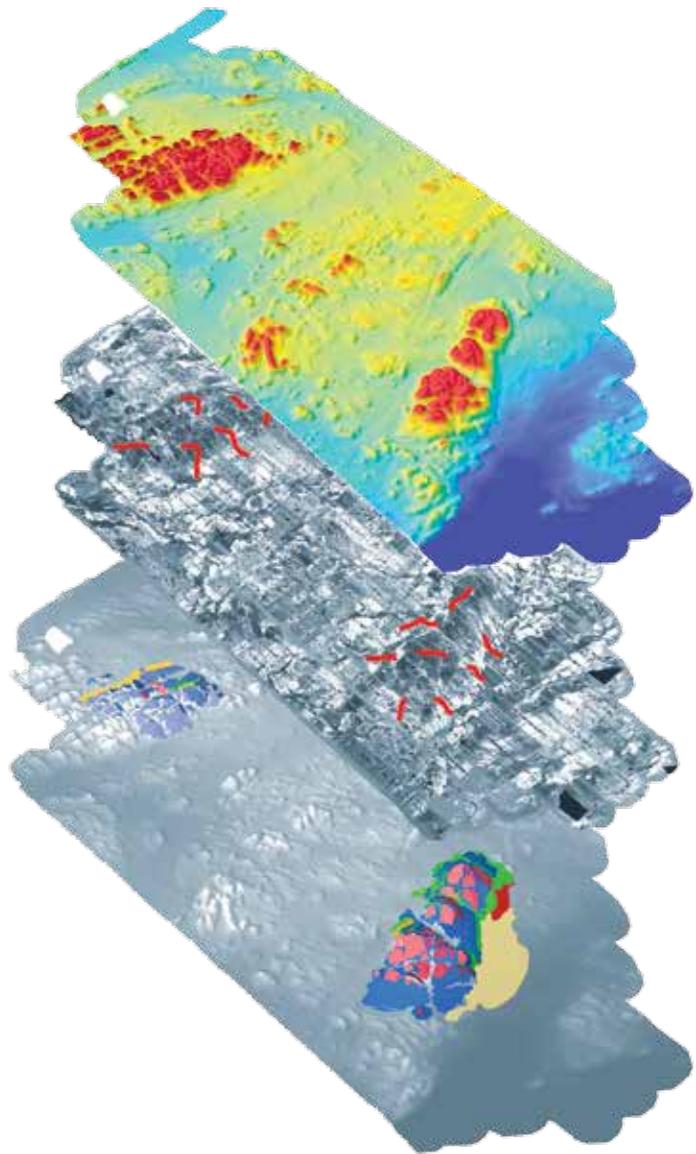
Ecosystem studies and environmental monitoring

As part of its integrated marine programme, AFBI undertakes regular biological oceanographic surveys of the Irish Sea and adjacent sea areas to gain an insight into the structure and functioning of the marine ecosystem, to assess the current status of these waters and monitor changes in key environmental variables.

Corystes is used to make traditional shipboard measurements such as temperature and salinity, collect water samples for the determination of dissolved nutrient concentrations and sampling to determine the seasonal abundance and composition of phytoplankton and zooplankton populations in the Irish and Celtic seas.

Instrumented moorings, which are deployed, serviced and recovered using the Corystes, are an important element of the biological oceanographic work. The instruments mounted on the moorings provide high frequency (daily) measurements of temperature, salinity and nutrient concentrations which give fine detail of seasonal cycles and inter-annual variability that are being used to identify long-term trends in these key variables.





Marine Habitat Mapping

In order to manage our marine resources effectively and sustainably, it is necessary to understand the extent and distribution of marine seabed habitats of various types. It is especially important to identify and map marine habitats that have high conservation value. A wide range of activities potentially place demands on habitats, including fishing, aggregate extraction, leisure activities and marine renewable energy developments.

Previously, habitat distribution maps were made by extrapolation from limited point source data, lacked spatial resolution and did not allow multi dimensional visualisation of the resource.

Using the RV Corystes, AFBI has begun to develop high resolution maps of the seabed around Northern Ireland, by applying state of the art high resolution multi-beam acoustic technology.

This approach, coupled with sea bed imagery gathered by a remotely operated vehicle (ROV) and drop down cameras has allowed AFBI to begin to develop detailed maps of the seabed. These will facilitate future decisions on fisheries management, the development of Marine Conservation Zones and on spatial planning issues to be made with greater confidence.

RV Corystes- Specifications

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The RV Corystes is a double-hulled diesel-electric research vessel. Two generating sets produce 2000kW at 750rpm and RV Corystes meets the ICES 209 criteria for acoustic surveying silent ships. Auxiliary generating sets provide electrical power at 660V AC, 415V AC, 240V AC and 24V DC.

The vessel was built by Ferguson Ailsa in Troon in 1988. Her port of registry is Belfast and the current operational area includes Malin Shelf, Irish Sea, Celtic Sea and the English Channel.

The RV Corystes is fitted with a comprehensive range of navigation, track plotting, communication and echo sounding equipment. Acoustic surveying is supported by a Simrad EK 60 38kHz and 120kHz split beam (120kHz transducer available) c/w Echoview and a Simrad SH80 high frequency sonar. Two moon pools available (fore and aft), for equipment deployment and the forward moon pool can be rigged with a multi-beam sounder for seabed mapping.

The RV Corystes is fully equipped for the deployment and recovery of moored oceanographic equipment arrays. Two Norwinch low-pressure trawl winches are controlled by a Scantrol Auto-trawl System and are fitted with 1000m x 24mm warps. The net drum has 7 tonnes pulling power. The vessel is fitted with a variety of smaller winches.

The vessel has a removable custom fish hopper for sampling trawl net samples and can carry a 6.15m x 2.46m containerised laboratory on the trawl deck.

The stern A-Frame has a SWL of 7 tonnes, with 7m Clearance and 2m extension and the starboard A-Frame has a SWL of 2 tonnes, 7m clearance and 6m extension. The vessel is fitted with three Guerra 20 tonne @ 1 metre marine cranes to enable the deployment of a wide range of over-side equipment, including a Gulf VII high speed plankton sampler, a Seabird SBE21 salinometer, fluorimeters, water samplers, dredges and corers and a tethered SeaEye Tiger ROV fitted with a Simrad Kongsberg OE14-124 3 CCD video camera, a Trittech image scaling camera, a Simrad Kongsberg stills camera and a flash unit.

Other on board scientific equipment includes a TRANSAS Electronic Chart Repeater, a range of Marel HF marine weighing balances from 1g capacity ($\pm 0.1g$) to 60Kg ($\pm 10g$).

Laboratory Areas	Biological Wet Lab	24m ²
	Multi-Purpose Dry Lab	27m ²
	Plot/Control Lab	5m ²
	Acoustic/oceanographic control lab	13m ²
Main Dimensions	Length OA	52.25m
	Beam	12.8m
	Freeboard to working deck	2.5m
	Full Load Draft	5m
	Full Load Displacement	1550 tonnes
	Gross tonnage	1280 tonnes
	Free Working Deck Area	250m ²
Capacities	Fuel	232m ³
	Fresh water	84m ³
	Ballast water	238m ³
	Fish freezer/ refrigerators	16m ³
	Dry cargo holds	197m ³
Range	Cruising range	9000 nautical miles
	Cruising speed	10 knots
	Maximum speed	12 knots
	Nominal Endurance	20 days
	Average fuel consumption	4 tonnes per day at 10 knots
Accommodation	Officers	7 persons
	Other crew	9 persons
	Scientists	9/11 persons in 9 cabins
	Air Conditioned	Yes

Owners: Agri-Food and Biosciences Institute (AFBI)

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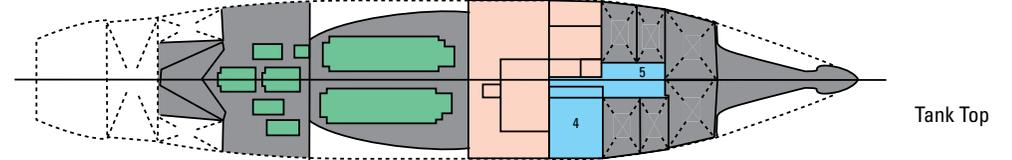
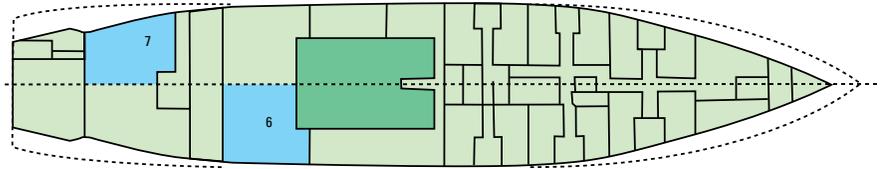
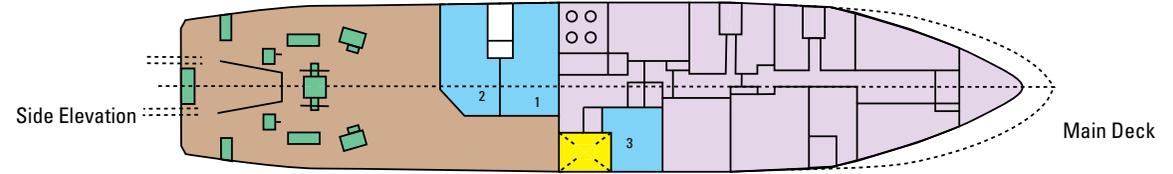
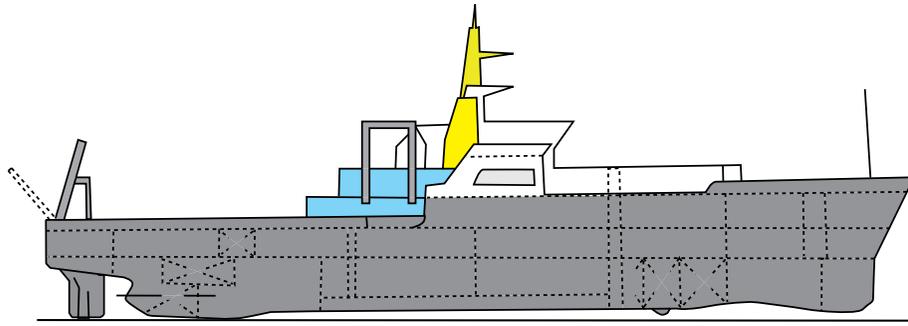
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Deck layout of the RV Corystes



- 1. Dry Laboratory
- 2. Wet Laboratory

- 3. Acoustic Laboratory
- 4. Gym

- 5. Acoustic transducer Space
- 6. Machinery Control Room

- 7. Net Store

Aft layout of the RV Corystes showing possible configuration for 20ft container system.

