Code of Conduct for Marine Scientific Research Vessels

John Breslin (Marine Institute, Ireland)
Dennis Nixon (UNOLS, USA)
Geraint West (NERC, UK)

(The Good, the Bad and the Ugly)

Conclusion

All anthropogenic activities have potential environmental impacts. The objective of this code is to minimise those impacts while adopting a pragmatic approach that facilitates the conduct of marine scientific research.

Preamble

Recognising the importance of vessel-based marine scientific research, ***we strongly encourage the utilisation of environmentally responsible practices***. Acknowledging the potential impact that the conduct of marine scientific research may have on the environment, the delegates to ISOM have approved the following guidelines for the conduct of scientific operations at sea. Those subscribing to this code consider preservation of the environment as paramount, and consequently adopt the precautionary approach as the basis for the proposed mitigation measures.

Environmental Impacts and Responsible Research Practices

Every vessel conducting marine science should develop a marine environmental management plan. The following are common areas where certain operations may have an impact and the complexity of these measures will vary on a case-by-case basis depending on such factors as vessel size, duration of voyage, geographical location, and mission type.

Areas for Consideration

- A. Ship Operations
- B. Science:
  - (1) Physical Impacts
  - (2) Acoustical Impacts
  - (3) Chemical Impacts
  - (4) Accidental

A. Ship Operations:

- **Activities:**
  - Oil spills
  - Exhaust emissions
  - Garbage/plastics disposal
  - Sewage discharge
  - Anchoring
  - Hazardous waste release
  - Vessel noise emission
  - Grounding/collision events
  - Ballast water release

- **Mitigation:**
  - Every research vessel should be operated in compliance with the International Safety Management (ISM) code (or equivalent), which addresses all the above listed potential activities. Where there are special requirements for operations in sensitive areas (including marine protected areas, polar latitudes etc), additional measures such as specialised training, procedures, crew, or equipment may need to be incorporated into the cruise plan.

B. Science: (1) Physical Impacts:

- **Activities:**
  - Dredging
  - Grab & core sampling
  - Lander operations
  - Trawling
  - Mooring deployments
  - Remotely Operated Vehicle (ROV) sampling
  - Jetting system operations for cable burial
  - High Intensity lighting for camera operations

- **Mitigation:**
  - The cruise plan should be designed to employ the most appropriate tool(s) to collect the scientific information while minimising the environmental impact. The number of samples taken should be minimised, and in particular, scientists should consider available existing biological and physical data and/or samples from the target site. Where appropriate a pre-site survey should be conducted to determine possible impacts and suitable mitigation measures. The sampling methodologies should be designed to match the site-specific characteristics of the area, in particular through the use of less intrusive tools in sensitive/protected areas.

(2) Acoustical Impacts:

- **Activities:**
  - Seismic surveying
  - Sub-bottom profiling
  - Multibeam or single-beam surveying
  - Sidescan surveying
  - Acoustic positioning
  - Scanning fish-finding sonar operations
  - Acoustic Doppler Current Profiling (ADCP)
  - Rock drilling and chipping

- **Mitigation**
  - The minimum acoustic source level and duration to achieve the desired results should be used and the acoustic frequencies chosen in order to minimise impacts on marine life. In areas where marine mammals are known or are suspected to exist, additional measures may be required including, for example, soft-starts, visual surveillance and acoustic monitoring.

(3) Chemical Impacts:

- **Activities:**
  - Tracer (dyes, fluorescent beads, SF6 etc.)
  - Seeding (CO_2 sequestration)
  - Expendable Bathythermograph (XBT) – copper, batteries

- **Mitigation:**
  - The use of chemical tracers should be discouraged, as well as the use of expendable devices which contain hazardous materials. Where there is no alternative to these techniques, every effort should be taken to minimise their use.

(4) Accidental:

- **Incidents:**
  - Behavioural impacts on marine life
  - Chemical discharge – eg hydraulic fluid leakage from ROV; release of radio-isotopes
  - Cross-contamination of biological communities
  - Pollution resulting from loss of equipment – e.g. batteries and instruments
  - Discharges from drilling or coring into shallow oil/gas
  - Physical disturbance of delicate habitats – ROV umbilical, errors in manoeuvring and anchoring

- **Mitigation:**
  - A risk assessment of the entire cruise plan should be completed before any equipment is deployed. If necessary, the operator should consider modifying the equipment and/or expertise employed in order to reduce risks to an acceptable level. In some cases it may be necessary to develop contingency measures in order to recover lost equipment (including collaboration with other research vessel operators.)