

ADDING TO THE GLOBAL BATHYMETRY MOSAIC

Ocean Mapping for Article 76

Many coastal states are engaged in ocean mapping as part of their UNCLOS-driven programmes to project sovereign rights over the deep seabed beyond two hundred nautical miles. The resulting datasets may be valuable for improving public descriptions of bathymetry, but first they need to be released into the public domain.

The United Nations Convention on the Law of the Sea (UNCLOS) came into force on 16th November 1994 and has so far been ratified by 157 of the 192 UN member states. Article 76 of the Convention qualifies coastal states to extend certain sovereign rights over portions of the seafloor beyond two hundred nautical miles. Paramount among these rights is the authority to manage and exploit the nonliving resources of the seabed and subsoil, as well as so-called sedentary species that live on and in the seabed.

Flurry of Mapping

In recent years the prospect of extending coastal state jurisdiction over potentially valuable seabed resources has precipitated a flurry of ocean-mapping activities in areas adjacent to many of the world's continental margins. For the most part these surveys are being undertaken in deep waters that historically have not been well mapped. Typically the operations tend to focus on key areas critical to the implementation of Article 76, so they may not produce comprehensive bathymetric maps covering large areas. But even in piecemeal form, the output of these mapping initiatives will help improve our knowledge of seafloor depth and morphology, should their owners make them available for integrating with datasets already existing in the public domain.

At present it is not clear how much of this new information is likely to see the light of day once coastal states have finished defining the outer limits of their extended sovereign rights. To date, the process of implementing Article 76 has tended to be shrouded in secrecy, and it is too early to predict how many participating states will be prepared over the longer term to release their supporting datasets.

Article 76

It is estimated that upwards of fifty or sixty coastal states may be eligible to apply the provisions of Article 76 in the oceanic areas adjacent to their continental margins. To date, only nine states have proposed extending their sovereign rights into a total of 25 zones beyond two hundred nautical miles. Other submissions are under development by an unknown number of states, presumably intent on meeting the 13th May 2009 deadline that applies to the 129 coastal and landlocked states that ratified UNCLOS prior to 13th May 1999.

The entitlement of a coastal state to extend its sovereign rights depends on the width of its continental margin. To qualify, the state must meet the criteria specified in Article 76, which are based on consideration of seafloor morphology and bathymetry and of underlying sediment thickness. To meet these criteria it is necessary initially to assemble and analyse information for reliable determination of the locations of three undersea features. The first of these is the Foot of Slope: the point of maximum change of gradient at the base of the continental slope. The second is the 2,500m isobath, and the third the location of the so-called Gardiner Line, where the thickness of sediment equals 1% of the distance back to the Foot of Slope.

These three features are used as points of departure for applying the two formula lines and two constraint lines referred to in the Article. Derived from an analysis of seafloor morphology and sediment thickness, the formula lines are used to determine the outer limit of the continental margin. Defined by their distances from the 2,500m isobath and from the coastal state's territorial sea baseline, the constraint lines are used to preclude exaggerated or unwarranted claims relating to the breadth of the continental margin. When combined, the formula and constraint lines prescribe the outer limit of the extended continental shelf.

Article 76 requires a coastal state to document the foregoing process in a submission laying out the case for an extended continental shelf. This involves (a) describing the datasets assembled for delimitation purposes, (b) presenting and discussing the results of their analysis, and (c) listing the geographical coordinates of the proposed outer limit(s) of the state. The submission is examined by the Commission on the Limits of the Continental Shelf (CLCS), which reviews its contents and conclusions in order to develop a set of recommendations that may or may not confirm the submitting state's entitlement to an extended continental shelf. In this context, the Commission pays special attention to the adequacy and quality of the substantiating data submitted by the coastal state.

The CLCS consists of 21 experts in the field of geology, geophysics or hydrography, each serving in their personal technical capacity. Nominated and elected by those states party to the Convention, Commission members hold office for a five-year term that may be renewed upon re-election. It is important to note that while members do not represent their nominating states, they nonetheless receive from them important sponsorship benefits and states must commit to defraying expenses incurred in the performance of official Commission duties. Commission meetings are closed and details of their deliberations are not generally available to the public. It is also worth noting that, where the exercise of their functions are concerned, members are accorded the same privileges and immunities as 'experts on missions for the UN.'

Ocean Mapping

Sounding observations are required to determine the Foot of Slope and the 2,500m isobath, whereas seismic measurements are needed to localise the Gardiner Line. In many situations coastal states may lack the necessary information to describe these features adequately for Article 76 purposes. It follows that a state proposing to develop an extended outer limit must begin by taking stock of existing data holdings within its area of interest, and then if necessary determine how best to compensate for data deficiencies.

In many areas this may be the first time that comprehensive data compilations have been attempted, and in some cases their outcome may prove sufficient for constructing provisional outer limits. For instance, the motivation for producing the International Bathymetric Chart of the Arctic Ocean

(IBCAO, Jakobsson et al, 2000) stemmed from the recognition that Arctic coastal states would benefit from a single map portraying a common perception of the depth and morphology of the Arctic Ocean. This has proven to be the case: following its release, IBCAO provided abasis for assessing the region’s continental shelf prospects (Macnab et al, 2000).

Compilations are more likely to identify the need for additional observations, and may prove useful as planning tools for designing and implementing supplementary data-gathering operations. Depending on circumstances, new surveys may feature a combination of mapping strategies ranging from selective profiling across key features of interest to swath mapping over large segments of the seafloor. These operations may include seismic reflection measurements which, in principle, are able to yield water depths, albeit with less accuracy and resolution than conventional echo-sounding techniques.

Data Confidentiality

Regardless of their scope and extent, Article 76 compilations and surveys may represent substantial investments in human, financial and technical resources. Following the exploitation of results for Article 76 purposes, the benefit of these operations could be enhanced substantially should the output be placed in the public domain and thus applied to the general advancement of human knowledge. In principle this sounds like a practicable strategy but in practice may prove difficult to realise on a widespread basis, given the atmosphere of secrecy that has so far surrounded the process of implementing Article 76.

For reasons related to national security, proprietary concern or other sensitivities, submitting states have so far tended to keep their supporting information under wraps, although some have indicated a willingness to share data and information upon completion of the implementation process (Sorensen et al, 2005). In this context it does not seem unreasonable to recommend that supporting data be released at an early stage in the process, considering the fact that it is being used to substantiate coastal state appropriations of the ‘common heritage of mankind.’ It could be argued that other stakeholders and interested parties deserve the opportunity to examine these datasets in order to reassure themselves that continental-shelf submissions do indeed meet the criteria of Article 76, and that the recommendations of the CLCS are appropriate to the circumstances.

In addition to enabling improvements in bathymetric knowledge, the release of new observations into the public domain would promote transparency and openness in the Article 76 process. The United States presents a notable example in this respect. This country has yet to ratify UNCLOS, but is engaged in a major mapping programme for Article-76 purposes while adhering to a policy of releasing datasets within a short time of their acquisition (see the CCOM/JHC website - 1). If other coastal states choose to follow suit there can be little doubt that Article 76 will spawn an important legacy for the benefit of marine cartographers and others who require detailed descriptions of the seabed.

Citations

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