

# S-10X Maritime Boundary Product Specification - Explanatory Notes

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April 2013

## Purpose

The purpose of this document is to explain the methodologies envisaged to encode data in the specification, in particular the geometry and attribution of each maritime boundary primitive. It should be read in conjunction with the specification.

## Introduction

The S-10X maritime boundary product specification is designed to provide a suitable format for the exchange of digital vector data pertaining to maritime boundaries. The specification is customised to ensure the unique features and attributes of maritime boundary information can be exchanged between States. The specification is also intended to be suitable for lodging digital maritime boundary information with the United Nations for purposes related to UNCLOS. The specification addresses a need for a non-proprietary format that is both open standard and sufficiently flexible to meet the needs of States.

The specification was designed with two primary criteria: it should not, by its content or attribution, attempt to form a prescriptive interpretation of UNCLOS; and the specification would contain sufficient precision and attribution to be utilised for many platforms and applications. State Practice and the current trends in geographic information management and dissemination provided the roadmap for development.

The specification was developed in part from a request from DOALOS that digital datasets submitted for continental shelf submissions should consist of strings of vertices rather than curve types (e.g. geodesics) between turning points. DOALOS further requested all geometries should be directly visible, not encapsulated in a proprietary data format. The specification addresses this request by recommending curves and surfaces be densified with vertices, published in an open source digital standard.

Salient features of the specification include:

- Rigorously defined positioning,

- Strong connection of data back to source documentation,
- Features and attribution are derived from UNCLOS, however the specification is sympathetic to State sensitivities by its non-prescriptive nature,
- Fulfills the same role as charts in UNCLOS by virtue of its inclusion in the IHO's S-100 Universal Hydrographic Data Model,
- Obsolescence is minimised by the use of text based coordinates and attributes, and
- By using GML the specification is suitable across a number of platforms and applications.

The specification is deliberately limited to encoding only the curves, limits and zones found in UNCLOS. No attempt was made to include national or international regimes (for example, joint development areas, purely domestic zones, petroleum and resource leases) not in UNCLOS due to the complexity inherent in properly scoping and encoding every possible situation. The IHO may need to consider the development of another S-100 based product specification to accommodate these regimes, possibly with a similar role to the S-57 Administration Areas (ADMARE) feature code.

### Geometry

The geometry used is a combination of all three primitives; points, curves and surfaces. The use of curves and surfaces is intuitive, however points are also included as many treaties and legislative documents describing maritime boundaries specifically refer to points. As with every other component of the specification, States are free to use those parts best suited to their specific requirements, no primitive types are mandatory.

The specification recommends curves and surfaces be densified with vertices to maintain curve types (e.g. loxodrome or geodesic); providing densified curves simplifies the algorithms used by ECDIS and GIS platforms, ensures the feature is correctly rendered regardless of projection or platform, as well as minimising the risk of possible disputes arising from differences in calculating the geodesic curves of a boundary. Geoscience Australia has developed a simple geodesic curve creation tool which will be available free of charge on its website.

By including as many vertices as practical a State will ensure the dataset always adheres to the State's concept of its maritime boundaries, not one calculated by the platform using the data.

Spatial resolution, States should consider that digital data is perceived by many to be absolute regardless of the precision of the source data. States may wish to consider this perception when defining their maritime boundaries digitally and to be aware of its implications, if any.

### Baselines

The specification includes the baseline types described under UNCLOS; normal, straight and archipelagic. These categories were chosen to support different legal regimes surrounding each baseline type. For instance, the legal status of the waters landward of an archipelagic baseline differs from those of a normal or straight baseline.

Points, curve and surfaces can be used to describe baselines. Points are used for those States that proclaim maritime jurisdiction in legislation as a series of points or the origin of an arc. Straight baselines may be densified as geodesics or loxodromes depending on the State's choice.

The geometries of the baselines may be encoded in several different ways:

Baseline	Points	Curves	Surfaces
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Normal	States may define their baselines by a series of critical points* or the origin of an arc	Curve of the baseline	Surface representing the landward side of the baseline
Straight	Series of points representing straight baselines	Curve of the straight baseline, with vertices adequate to represent curve type	Surface representing the landward side of the baseline
Archipelagic	Series of points representing archipelagic baselines	Curve of the archipelagic baseline, with vertices adequate to represent curve type	Surface representing the landward side of the baseline

\* Critical points are those locations on the baseline that form the origin of arcs making up the maritime limits.

#### Maritime Limits

Points are included for those States that proclaim maritime jurisdiction by a series of connected points.

Similarly to the baseline feature code; the categories of maritime limits or zones were chosen to reflect the change in legal regime the feature represents, rather than all possible limit forms.

In deference to State prerogatives relating to maritime limits and zones, no reference to the breadth of the various zones is made in the specification.

#### Maritime Boundaries

Points are included for those States that proclaim maritime jurisdiction by a series of connected points.

No special provision is made for the separate capture of bi or tri points for boundary treaty purposes, shared or joint zones or areas under dispute as this is not a requirement under UNCLOS.

#### Other Comments

**Point Type:** This attribute is included to differentiate points which are proclaimed or defined, and those which are inserted into the digital dataset to densify the curve for geometric purposes. The attribute is designed to maintain the distinction between those points which are part of the original legal instrument and those created to preserve geometry.

**Source horizontal reference system:** this attribute is included for those States which require a means of maintaining the link to the original datum of a treaty or legislation. The attribute ensures positional fidelity is preserved with the source document.

Published horizontal reference system: a mandatory horizontal datum isn't included in the specification as it is a matter for the State to decide. However, selecting an appropriately documented datum ensures ECDIS and GIS platforms can process the data correctly.

Source in degrees, minutes and seconds: the two fields (latitude DMS, and longitude DMS) are to provide a means of maintaining the link with the original positions described in treaties or documents if needed.

Vertical Regime: the standard UNCLOS maritime zones describe the sovereignty or sovereign rights of a State to the water column, seabed and subsoil. However, States may enter into treaties where the legal status of the water column, seabed and subsoil cannot be encoded using the standard maritime zones. For instance, this may occur where States have agreed to overlapping horizontal jurisdiction of an area; with each State having jurisdiction over either the water column or seabed and subsoil. This attribute should be used to describe the lodging State's jurisdiction in this overlapping area only.

Legal Source and Textual Description: these two fields may be used to define the relevant domestic instrument or treaty document relating to the feature.