



In search of the lowest astronomical tide at Pointe Indienne in the Republic of Congo © Pierre Mouscardes

# SHIP SHAPE

FOLLOWING ON FROM THEIR ARTICLE LAST ISSUE ON DETERMINING THE EXACT LOCATIONS OF COUNTRIES' BORDERS, CHRISTOPHE DEKEYNE AND CYRIL ROMIEU EXPLAIN HOW HYDROGRAPHERS AROUND THE WORLD – PARTICULARLY FRENCH HYDROGRAPHERS – DETERMINE COUNTRIES' MARITIME BOUNDARIES

The 1982 United Nations Convention of the Law of the Sea (UNCLOS), endorsed by 166 countries and the EU, aims to regulate the sovereign rights of coastal states on their territorial seas, continental shelves, bed and subsoil endowed with living and mineral resources, and the air space above. Under UNCLOS, the nautical chart is the legal medium by which national maritime boundaries are published worldwide. This speaks volume for the responsibility assumed by those hydrographers tasked with carrying out the surveys and producing the official charts.

French hydrographers are doubly concerned. Heirs of the world's most senior hydrographic office, established almost 300 years ago when their country was still a superpower, they are responsible for charting the second exclusive economic zone (EEZ) of the planet and assist their diplomats in negotiating with the 32 countries or so with which France shares maritime boundaries – an unenviable record they could do without, so complex is the knowledge required to reach an agreement between neighbouring countries, which must encompass geographical constraints, geophysical realities, historical practices, geodesy, astronomical tides, nautical charting, safety and navigation considerations, and finally jurisprudence.

The origins from which are measured the breadth of the well-known strips of water defined by the UNCLOS convention (that is the Territorial Sea, the Contiguous Zone, the EEZ and the 350 miles constraint line) are

the 'baselines'. Defined as the limit of the low water mark, a baseline is not easy to determine. First, it can only be observed once every 18.6 years, which is the precession period of the lunar nodes. Even then, it is often very poorly depicted on nautical charts.

For example, the baseline of the Gulf of Guinea has only been determined once – 170 years ago. To update it, one must conduct further surveys with the techniques of the 21st century and set off in quest of the elusive lowest astronomical tide. The baseline is now obtained using satellite images, topographic measurements of beaches' slopes and – water turbidity permitting – satellite-derived bathymetry.

Coastal states are required to deposit with the Secretary-General of the United Nations through diplomatic channels the list of coordinates and nautical charts depicting the baselines and outer limits of the maritime areas they claim.

Once plotted on official nautical charts, this geographic information becomes the basic ingredient required by lawyers and diplomats to settle their differences – in the best of cases, by gracious agreement, in the worst, by a laborious arbitration made by an international tribunal that surveyors must continue supplying with supporting evidence.

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