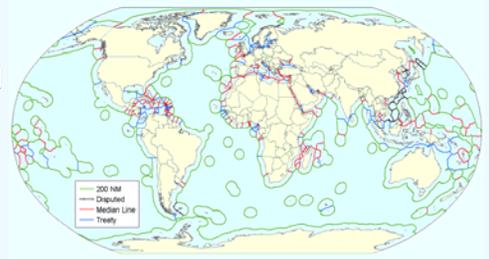


The VLIZ Maritime Boundaries Geodatabase as a biogeographical tool

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INTRODUCTION

Maritime boundaries and Exclusive Economic Zones in particular are important concepts for a lot of applications; they could, for example, be used in marine biogeography to create national marine species lists. As there was no global public domain cover available, VLIZ decided to develop one, and make it available to the scientific community. This led to the production of two global GIS-covers. The first contains the lines of the maritime boundaries of countries (see the picture in the header) and the second contains the polygons of the Exclusive Economic Zones. An Exclusive Economic Zone is the area extending 200 Nautical Miles of the coast of a country. If the distance between countries is less than 400 Nautical Miles, countries have to negotiate their boundary in treaties. If countries did not already negotiate a boundary, the boundary is expected to be the median line.

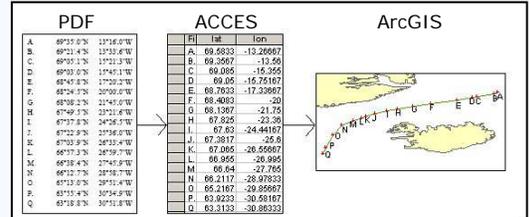


Figure 1: Digitisation of the treaty between Iceland and Denmark (Greenland)

METHODOLOGY

The first step of the creation of the geodatabase was the integration of information that was already available. The maritime boundaries of the United States, Australia and certain European Countries were freely downloadable from the internet in ESRI shp-format. Those 3 datasets were integrated into one shapefile.

In a second phase all treaties between countries, that are available on the website of the United Nations, were gathered and imported into a GIS. Hereafter, the coordinates were entered in a database after which they were connected in ArcView to a polyline (see Figure 1).

The remaining boundaries were calculated in a GIS in accordance with the United Nations Convention on the Law of the Sea: a 200 Nautical Mile buffer was drawn from the baseline or a median line between 2 countries was calculated.

Through the compilation of the boundary lines and the coastline, an EEZ-polygon per country was composed. This layer was compared with the commercial Veridian database by Asif Iqbal at Kansas University and this led to a 99% parallel.



Figure 2: Web page with info about the EEZ of the United Kingdom

WEB INTERFACE

The geodatabase is consultable through a website where one can search and download extra information about the maritime boundaries (<http://www.vliz.be/vmcdcddata/marbound>). It is, for example, possible to download the used treaties in PDF and the coordinates of the boundaries in GML (Geography Markup Language) (see figure 2). The geodatabase is not only consultable through a web form, but also through a map interface where one can zoom, pan or query the GIS-layers (see figure 3). Linking makes it easy to jump from the information pages to the map interface and reverse. The latter was implemented using the open-source MapServer, a development of the University of Minnesota that supports Open-GIS standards. This will allow for making the GIS-layers available in the future through WMS (Web Map Services) and WFS (Web Feature Services).



Figure 3: Map Interface of the geodatabase

APPLICATIONS

The layer with EEZ-polygons can be used to make national marine species lists. Therefore, an extra service will be built on the website where users can upload a list of geographical positions so they get back a list of the positions with their corresponding EEZ. The layer is also used in VLIMAR, the VLIZ Marine Gazetteer, where it is used to georefer locations like sandbanks, canyons, etc.

USEFUL LINKS

- VLIZ Maritime Boundaries Geodatabase:
<http://www.vliz.be/vmcdcddata/marbound>
- VLIMAR, the VLIZ Marine Gazetteer:
<http://www.vliz.be/vmcdcddata/vlimar>
- Mapserver Homepage:
<http://mapserver.gis.umn.edu>
- United Nations Legislations and Treaties:
<http://www.un.org/Depts/los/legislationsandtreaties/regionslist.htm>