

JAMMERBUGT I BALANCE



Image: Aerial photo of Jammerbugt. Published [online](#), July 2020. COPYRIGHT: Klaus Thymann.

DTU AQUA

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Contributor: Contribution was made by Klaus Thymann in the form of video and photo material (June 2020)

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1. SUMMARY

TASKS CARRIED OUT

A. Set up:

- Digitising the decca lines from Sea chart L(D7)5708
- Digitising the missing decca lines from Sea chart L(D7)5708

B. Fishermen's map:

- Compiling all data on the polygons in the fishermen's map (Fiskerikort) including labelling by zone (red / green / blue), substrate and fishing gear.
- Manually digitising the polygons from the fishermen's map using the digitised decca lines as guidelines.
- Joining the compiled data to the polygons layer

C. Validating data: Other maps

- Digitising map: Masses hov scan

D. Validating data: Media

- Compiling field data from Klaus Thymann, matching photos to locations where they were taken
- Image analysis: determining substrate, flora and fauna of each photo
- Adding image analysis information to compiled data table
- Importing image data into GIS and displaying geo locations of photos taken by Klaus

E. Validating data: Substrate

- Overlay analysis of substrate type in study area using EUSea map 20110204

NEXT STEPS

- Validating the polygons and moving them to the correct geo location.
- Checking the image analysis information for Klaus Thymann's images (verifying correct identification of substrate, flora and fauna)
- Overlay analysis of substrate type (extracting substrate information to each polygon of the fishermen's map)
- Validating the information from the fishermen's map against images and videos as well as EUSea maps

OUTPUT DATA

The PDF **Summary_Jammerbugt_Lydia** contains a detailed workflow description and information on the data in the folder **Jammerbugt_Lydia**. It is located at the following address on the DTU Aqua network drive:

(M:) \ Thorupstrand \ Jammerbugt_Lydia\

File Type	Format	Information
DECCA GRID	SHP	Saved by individual colour and as a complete grid
POLYGONS		Saved by individual colour zone, all labelled polygons merged, unlabelled polygons, polygons in the red zone drawn by Mads (Madses hov scan) and polygons partially or completely on land (for illustration of obvious misplacement)
POINTS		Location of data collected by Klaus Thymann
SPREADSHEETS	XSLX & CSV	Data on polygons and on media files
MAPS	PDF	Selection of maps for illustration of work and problems encountered
MAP DOCUMENT	MXD & MPK	Working document, final map document and map package (ideal for sharing across computers etc)
PROTOCOL	PDF	Moving polygons

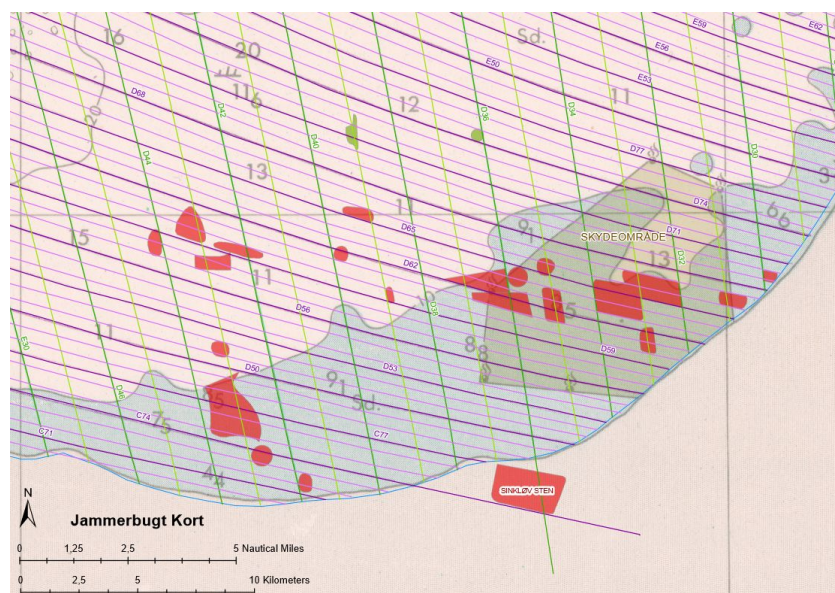
2. WORKFLOW

A. Set up

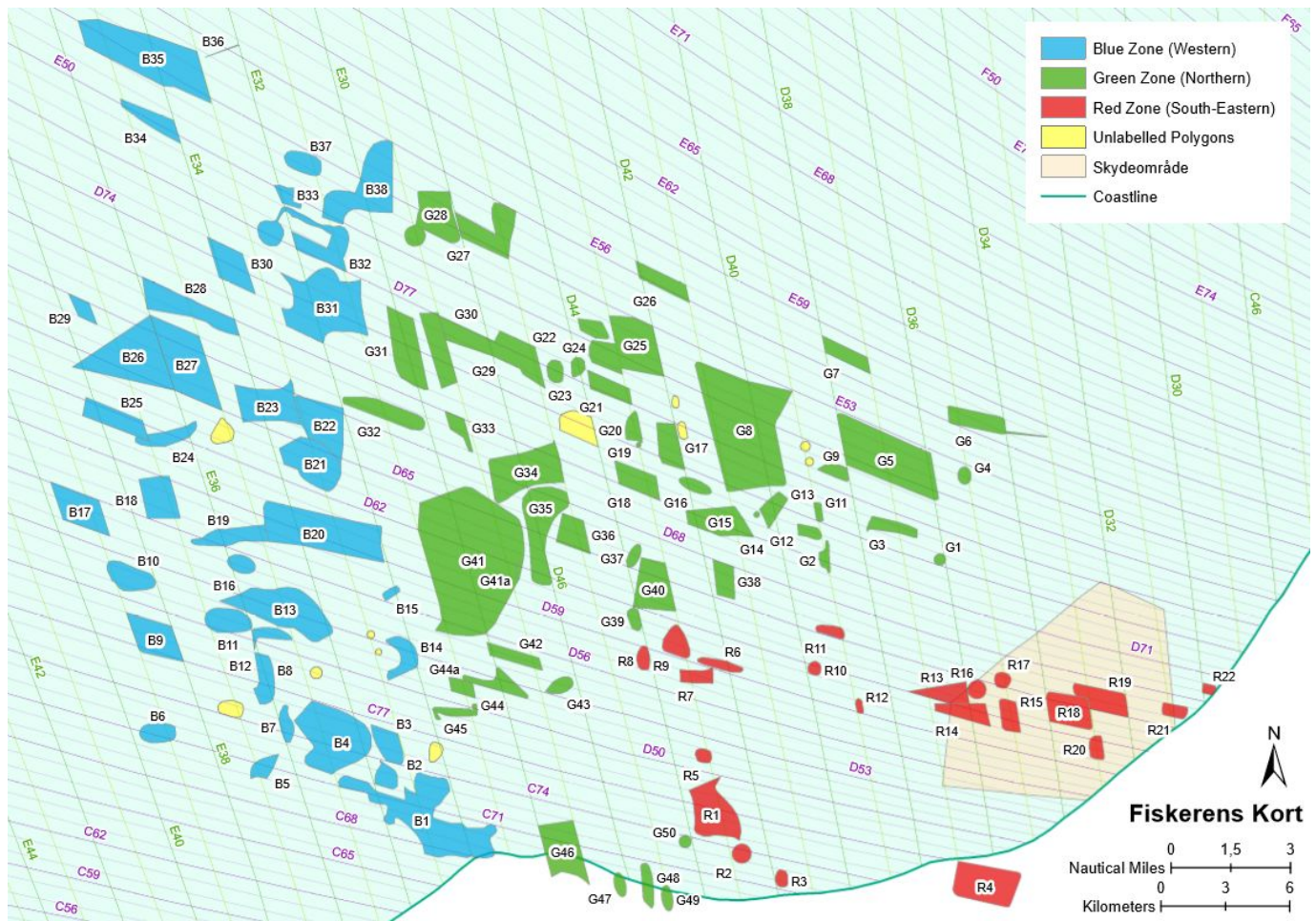
- Used files from Erik Hoffman to compile all known information into a spreadsheet.
- Coordinate system used: WGS 1984 UTM Zone 32N
 - This is the coordinate system used for the shapefile KystLand_II_UTM32WGS84
 - UTM Zone 32N is optimised for Denmark, and WGS 1984 is the most common international coordinate system.
- Digitised the coastline based on KystLand II UTM32WGS84 between the coastal towns of Hanstholm and Hirtshals.
- Digitised the study area extent.
- Digitised the decca lines represented on sea chart L(D7)5708: these were every second GREEN decca line and every third PURPLE decca line.
- Digitised the missing decca lines: every second GREEN decca line, every second PURPLE decca line. Used the latter to create the 'thirds' missing decca lines.
- Saved the output as individual shapefiles as well as one merged decca grid containing the coastline polyline for reference.

B. Fishermen's map

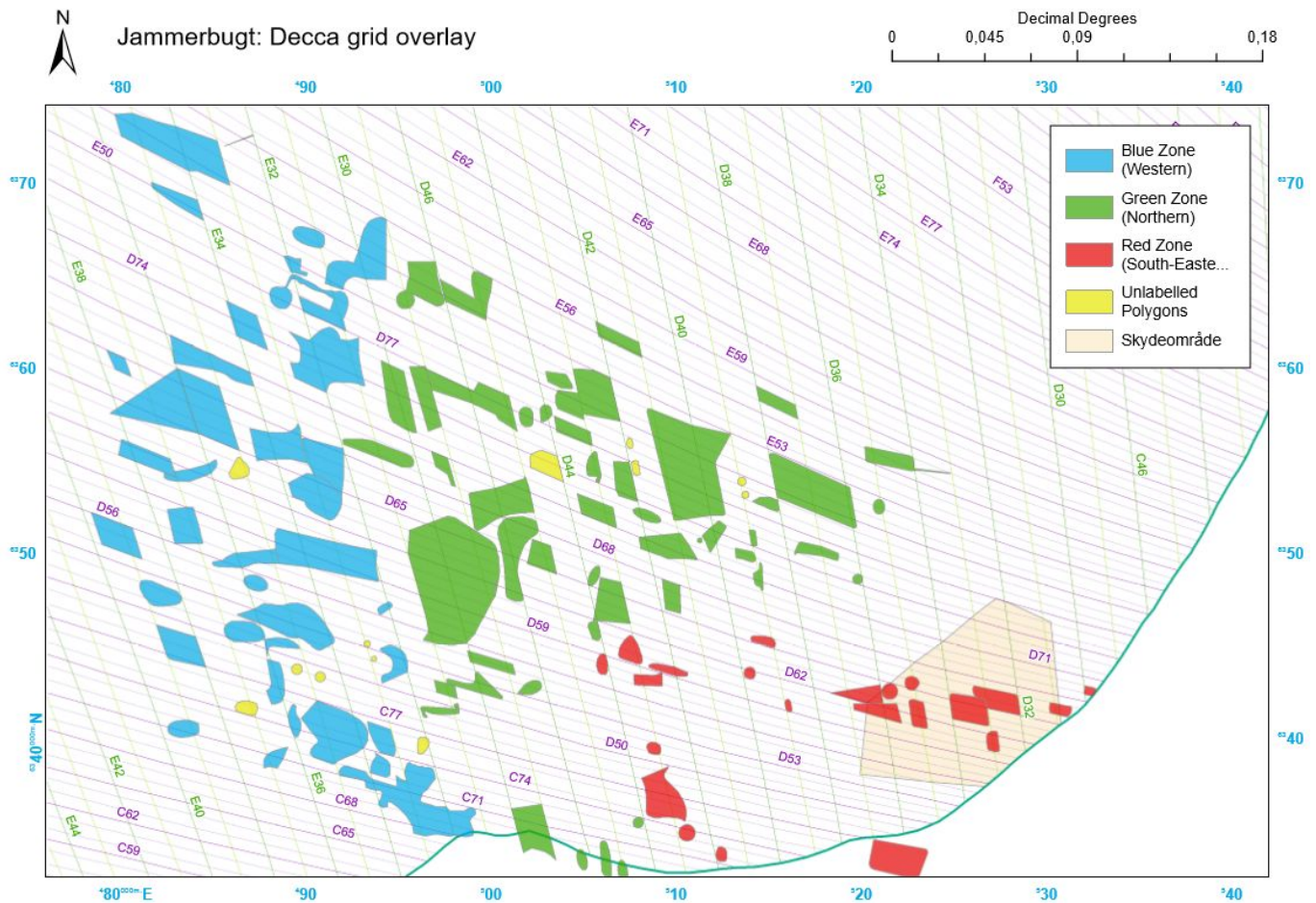
- Using the newly created decca grid, manually digitised the polygons from the fishermen's map (Fiskerikort) one zone at a time (RED, GREEN, BLUE).
 - **PROBLEM ENCOUNTERED:** it became apparent that there was a problem with the placement of polygons, since polygon 4 of the red zone is completely on land (*see map*).
 - **TROUBLESHOOTING:** We suspect that the problem is due to the mislabelling of decca lines on the fishermen's map, although this has not been confirmed.
 - **COURSE OF ACTION:** Created PDF maps to illustrate the problem to send to the team in Jammer Bay.



- Saved each output as a shapefile.
- Merged all the polygons and joined the table of information compiled from Erik Hoffman's report.
- Digitised the unlabelled polygons on the map.
 - **PROBLEM ENCOUNTERED:** Labelling hard to decipher, polygons cut off on edge of map, polygons with no labels at all.
 - **COURSE OF ACTION:** Created PDF maps to illustrate the problem to send to Erik Hoffman & other members of the team to request clarification.
- Saving and exporting: each polygon layer was saved independently as a shapefile.



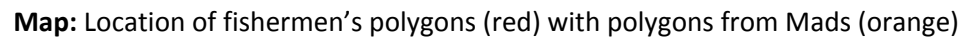
Map: All digitised polygons from the Fishermen's map with labelling.



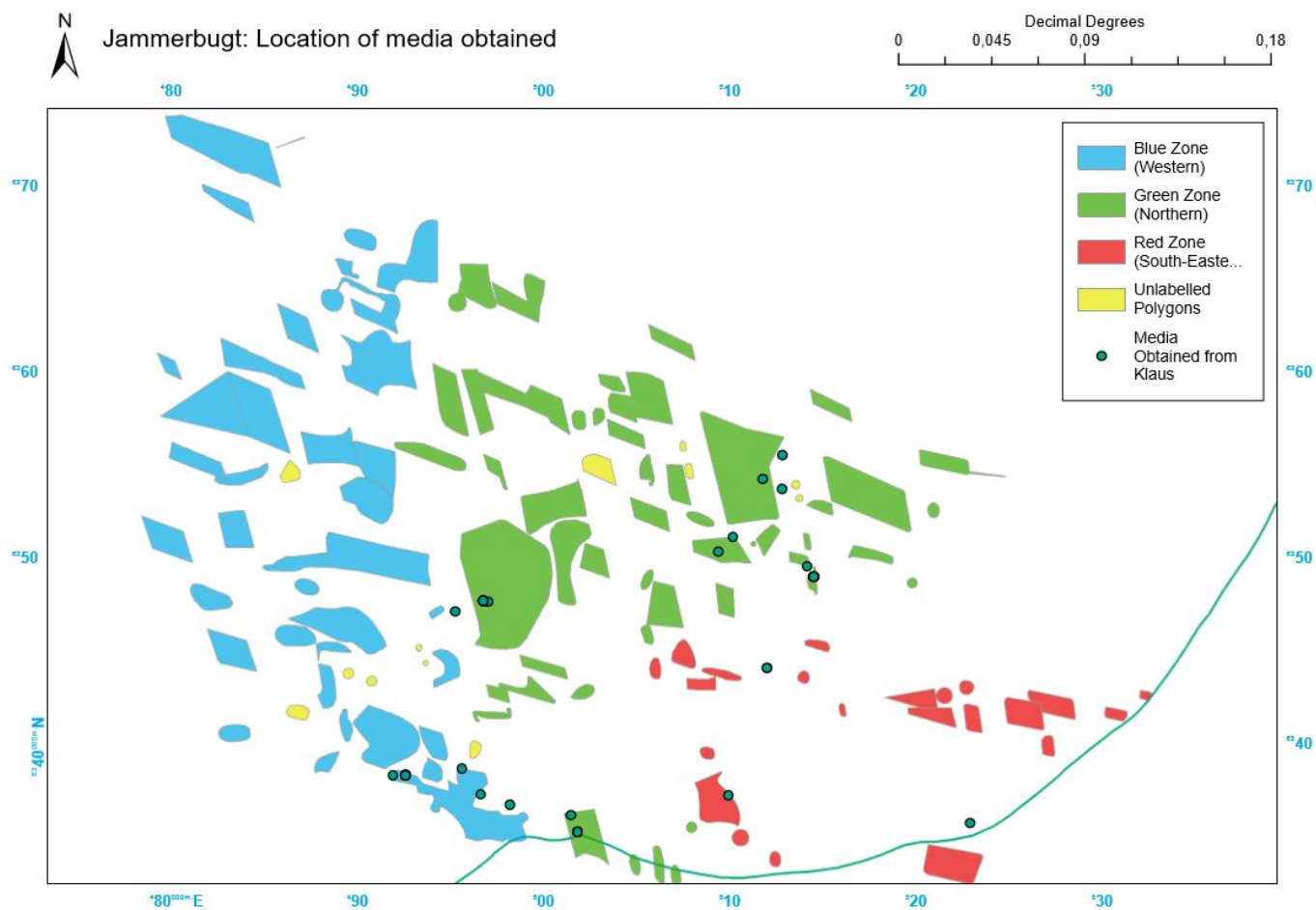
Map: All digitised polygons from the fisherman's map with grid for reference.

C. Validating data: other maps

- Converted 'Stenrev' map sent by Pipsen to a tif file. Imported it into GIS and tried to digitise it. The map was too warped to be able to digitise polygons (high root mean square error for georeferencing).
- Used 'Madses hov scan' which is drawn on a decca line grid to digitise the polygons drawn in this area.
 - Polygon shapes are more complex and in slightly different locations (*see map*)
 - It is not immediately obvious how the polygons from the Fishermen's map and those from Mads' map relate, seen as the location differences are not of the same scale & proportion.



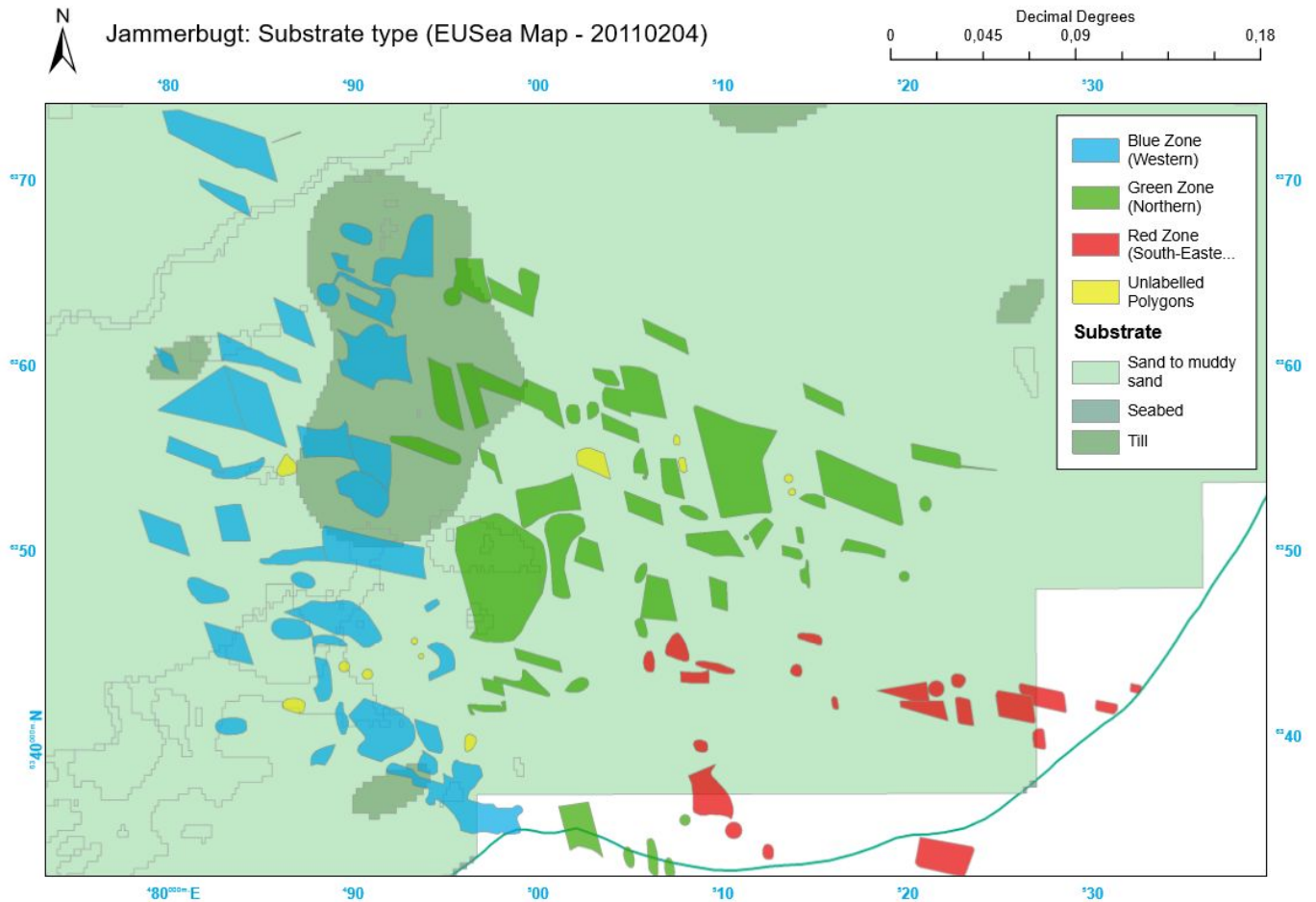
- Using the downloaded [dropbox images](#) from Klaus and the document of additional information ('2020_Thorupstrand_GPS-sheet') to see what images were available and which location they were taken in.
- Compiled the information from this table into a spreadsheet.
- Image analysis: Identified substrate, flora and fauna in each image.
- Imported data table into GIS and created a layer displaying the points (using coordinates given by Klaus. Coordinate system: WGS 1984).
- Polygons from the fishermen's map which should have photo validation (NB: this will change when the polygons are moved):
 - B1
 - R1
 - G2
 - G8
 - G12
 - G15
 - G41
 - G46



Map: Location of data collection by Klaus Thymann and his team in June 2020.

E. Validating data: Substrate

- Used the EUSea Map 20110204 to display the substrate type for the study area.
- Results showed that the substrate in the study area (according to the EUSea) is largely sand to muddy sand.



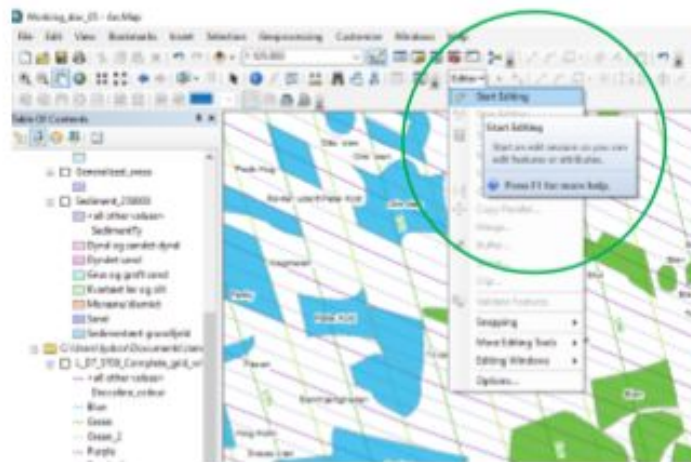
Map: substrate type in study area based on EUSea map 20110204

3. APPENDIX

PROTOCOL: Moving polygons

Protocol: how to move polygons in ArcGIS

1. Make sure the relevant layer you wish to edit is loaded correctly and displayed on the map.
2. Use the **EDITOR** toolbar to start an editing session (if the editor tool bar does not appear, right click at in the tool bar section and scroll down and click on "editor" to turn it on).



3. Select the layer to edit (e.g. "green_zone_polygons"). You might get a message appear that other layers in the map document do not having a matching spatial reference. Click ok.

4. Click on the cursor button (see photo).



5. Click on the polygon you wish to move (single click). An X will appear in the middle of the polygon. Now you will be able to drag and drop the polygon to a new location by clicking on the X.

Note: if you double click on the polygon, the individual vertices will appear and you will be able to shift them one by one (i.e. to change the shape of the polygon).

