Notes for work done August 3rd - December 2nd 2015

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Notes for lists & keys

Guild assignment

List of guilds

Feeding guilds are assigned the each species useing an external file (*"guilds.list"*). The list contains species names (common & scientific), feeding guild and size guild. Feeding guilds have been assigned to each species based on the work done by Greenstreet et al. (1996). Naturally, not all species present in fisheries data are included in that particualar piece of work, and have been added later using data from Fishbase.

Size guilds are based on Fishbase data, using the size-guilds suggested by *Kristin Klesner*, and choosing max adult length as the determining factor for size guild.

Reading the guild list

Asterixes indicate that a guild has been added to the list of feeding guilds in the North Sea (Greenstreet et al. 1996).

- * indicates a guild represented in the unedited guild list, but with a synomymous species name. These could easily be added to the synonymous guild
- ** indicates a guild *not* represented in the unedited guild list, and has been added manually, using data from Fishbase.

Gear list

The complete gear list have not been produced yet (26-10-2015). The gear list needs to collate the STECF gear designations from the Landings dataset and the Economic and Transversal dataset.

A list of gears in the STECF Landings dataset exists, and is used to rename gears.

Area key

The area key is based on information from the STECF Economic & Transversal dataset annexes. Ecoregion designations are based on FAO-area designations found on the FAO webpage (Fisheries & Agriculture Organization of the United Nations 2015.)

Data visualisation

Graphs

- Percentages for effort data is calculated in seperate datasets rather than upon load, as it is probably much easier to automate late on, should that become relevant.
- ddply is used to calculate percentages

Automation

Gear renaming

Gears need to be grouped by actual gear names, without restriction tags ("R-*"), and without overwriting the original data. This is largely fixed by using the gear list; it can be used mostly to remove "restricted"-tags and grouping similar gears, with different names in different areas. However, if new gears are only present in the dataset, they will not be renamed properly, and most likely left out.

Also, gears are names differently in the Economic & Transversal dataset, in which gears are grouped by function, more than gear type, e.g. "bottom scraping" rather than "otter trawl".

- Catches needs to be summed by **year**, and grouped with **gears** and **species**, in their respective **ecoregions**, and **sub-regions**. A solution may be to have R read column names, and act based on that.

General notes for data

- Column names can't start with numbers. Remember this; it will cause you trouble later, if you do not adhere by the Data Governing laws of the Almighty R.
  The Almigthy R (praised be its name) is able to interpret raw text-data, without messing it up – just be careful what you write in your `read.delim()`.
- Fleet **capacity** is reported only for some countries, and in *Gross Tonnage (GT)*, as opposed to kilowatts (kW). **Effort** is reported in *kilowattdays (kWd)*.

Caveats for STECF data

Caveats for fleet characterisations:

- Vessel length groups are not the same in the Baltic Sea as in other areas (13-18 m. group is problematic, however only constitutes 7 % of effort 2003-2013)
- Gear designations vary, especially in annex II, categories 3A-C are problematic, cat. 3A covers several gears
- Data about gear use in the North Sea are lacking, as no info is provided for 14 % of effort (2003-2014)
- Data about vessel length is missing for 54 % of vessels in IIB (IIB is not used in the preliminary characterisation, as it contains data for Iberian peninsula only)
- Data is not divided into ICES squares & ecoregions, which makes proper characterisation of each region difficult, e.g. sq. VIIe which contains data from Celtic Seas and NS

Data in *Annex IIC* has been split into NS and CS based on "country codes" (see Table 1)

- Actual vessel numbers are difficult if not impossible to determine, as data only contains summarised vessel data. "Vessel numbers" are actually a measure of how many vessels have been part of a certain activity, i.e. fishing with pelagic trawls in an area for a given year. This means that vessel numbers are grossly overestimated, and "vessel numbers" is more than anything a measure of vessel visitations to a given area.
- There are (too) many gear types, and some of the categories are overlapping. It may be advisable to summarise some of the categories, as the fleet characteristics are not meant to be advice, but to give an idea of how fish are caught, and as such information about restricted gears are not of immediate interest. The type of restricted gear is, however, and usually the general type of gear (e.g.

"otter trawl") is present in the datasets in much greater proportions, thus specific and restricted gear designations can easily be included in more general categories without skewing the data too much. However, consolidating the gear types may give a clearer picture of the composition of the fleets.

- Gears may be grouped by different characteristics, e.g. target species (either target species("cod"), or placement in water column("demersal")), catch methods (traps, trawls etc.), movement (active/passive), or simply general gear types (otter trawls, seines etc.), or combinations thereof (when that makes sense; an "active trap", for example, would be a trawl). DCF gear metiers may also be useful, but are even more specific. Maybe a combination of level 4 & 5 (type & target species) is useful?

- There are too many species names to produce anything that is general for each region, while still being descriptive. Maybe grouping species by feeding or size guilds, will simplify graphical and generalised data products. There may be a challenge in automating this. A key for assigning guilds to species, by species name, have been produced. (`./key-list/guild.list`)

Code	Country	Ecoregion in sq. VIIe
ENG	England	Celtic Seas
IOM	Isle of Man	Celtic Seas
IRL	Ireland	Celtic Seas
NIR	Northern Ireland	Celtic Seas
SCO	Scotland	Celtic Seas
BEL	Belgium	North Sea
DEN	Denmark	North Sea
ESP	Spain	North Sea
FRA	France	North Sea
GBG	Guernsey	North Sea
GBJ	Jersey	North Sea
GER	Germany	North Sea
LIT	Lithuania	North Sea
NED	Netherlands	North Sea

Missing data

- Parts of the STECF fleet level economic dataset are missing. Specifically proper sub-region designations are missing for some data points, and have been left out of analysis. 53660 of 548578 data points with the supra region designation **"AREA27"** have been left out due to missing (*NA*), improper (*0*) or incorrect (e.g. *"21.1.c"*) subregion designations.

References

Fisheries & Agriculture Organization of the United Nations. 2015. "FAO Major Fishing Areas Northeast Atlantic (Major Fishing Area 27)." *Fishieries & Aquaculture Department*. http://www.fao.org/fishery/area/Area27/en.

Greenstreet, Simon P. R., Andrew D. Bryant, Niall Broekhuizen, Stephen J. Hall, and Mike R. Heath. 1996. "Seasonal Variation in the Consumption of Food by Fish in the North Sea and Implications for Food Web Dynamics." *ICES Journal of Marine Science* 54 (2). Nature Publishing Group: 243–66. doi:10.1006/jmsc.1996.0183.