

# ICELAND

Offshore Exploration



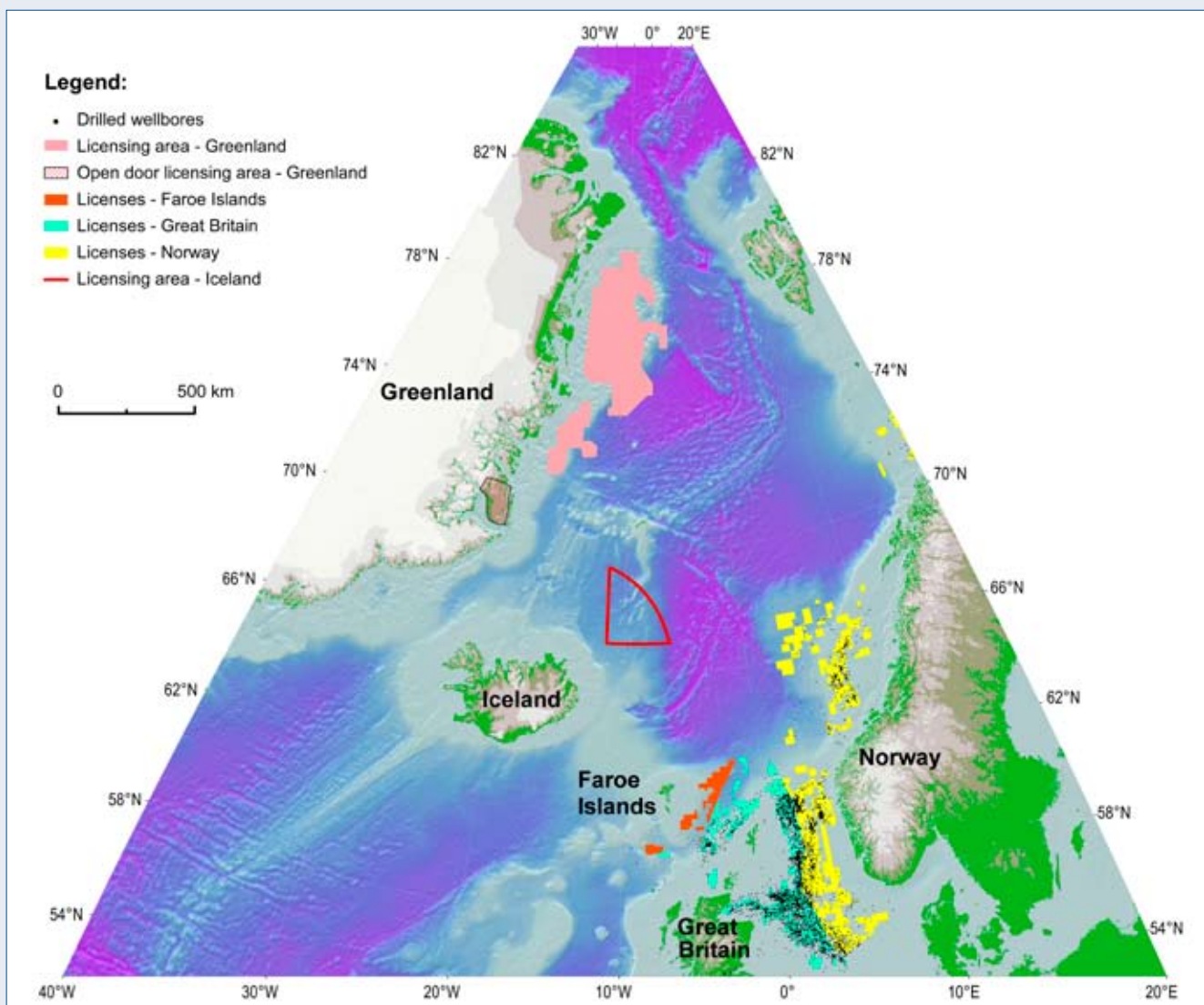


## Iceland: beginning arctic exploration

- Geology similar to other areas on the North Atlantic Margin.
- Significant amount of geophysical data available.
- Indications for potential existence of oil and gas accumulations.
- Surface geochemistry survey done in 2010.

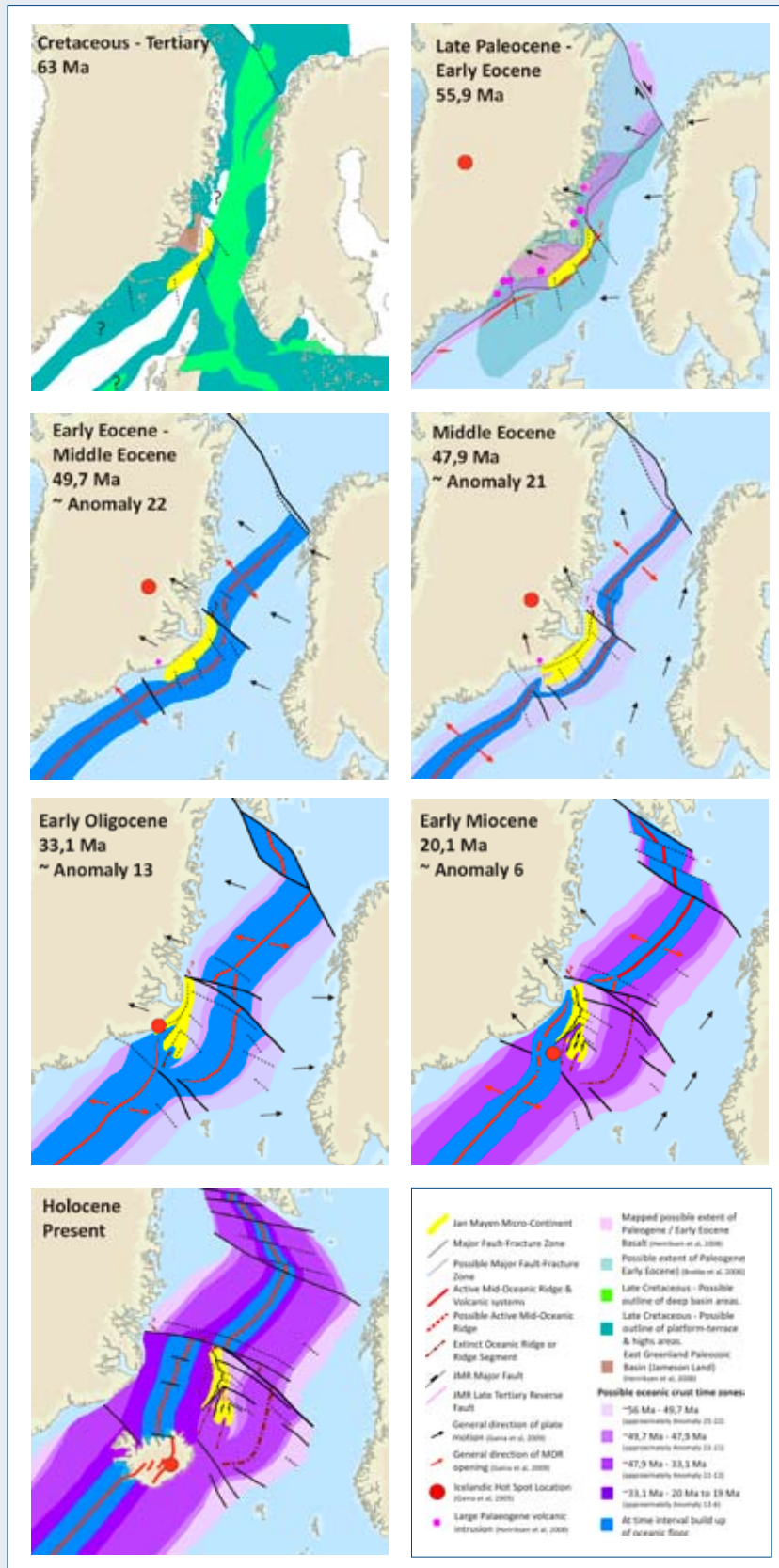
## Second licensing round

- Starting date 1 August 2011.
- Deadline for license applications 1 February 2012.



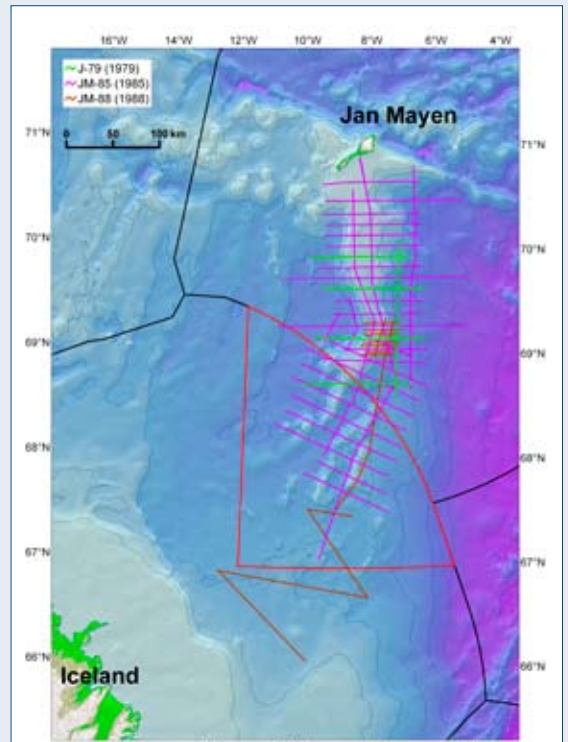


## Tectonic history

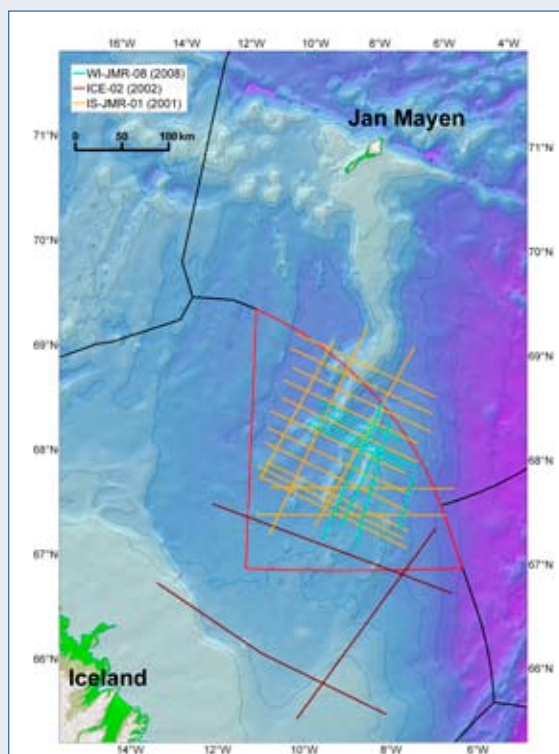


## Exploration data

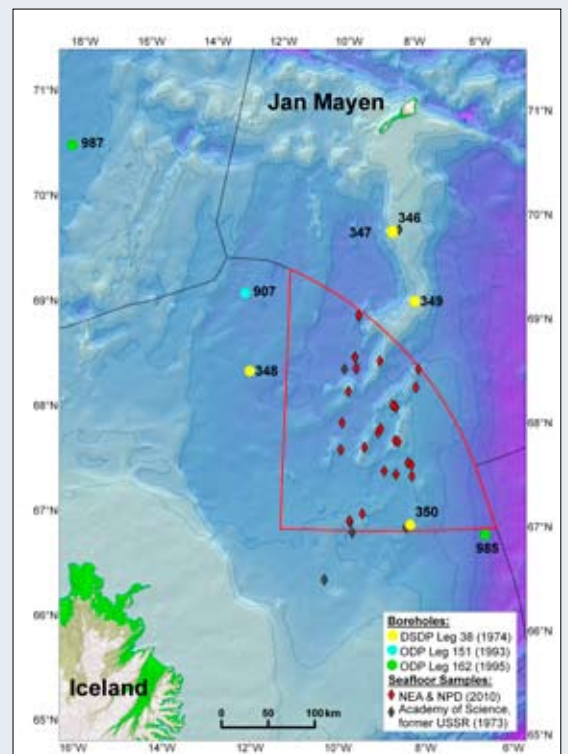
- Locations and metadata shown in the Icelandic Continental Shelf portal: [www.icsp.is](http://www.icsp.is)
- Major sources for 2D seismic reflection data:
  - Norwegian/Icelandic governmental surveys in 1985 and 1988, available at copy-cost through NPD in Norway.
  - Spectrum has reprocessed the data from the 1985 and 1988 surveys, available for sale through Spectrum.
  - CGG Veritas non-exclusive, prospecting surveys in 2001 and 2008, available from CGG Veritas.
  - TGS-NOPEC non-exclusive, prospecting survey in 2002, available from TGS-NOPEC.
- Shallow boreholes from the Deep Sea Drilling Project and Ocean Drilling Program.
- Surface seafloor samples collected in 1974 and 2010.



Approximately 5800 km of seismic reflection lines acquired by Norway in 1979, and by Iceland and Norway in 1985 and 1988. Reprocessed data for 1985 and 1988 surveys available from Spectrum.

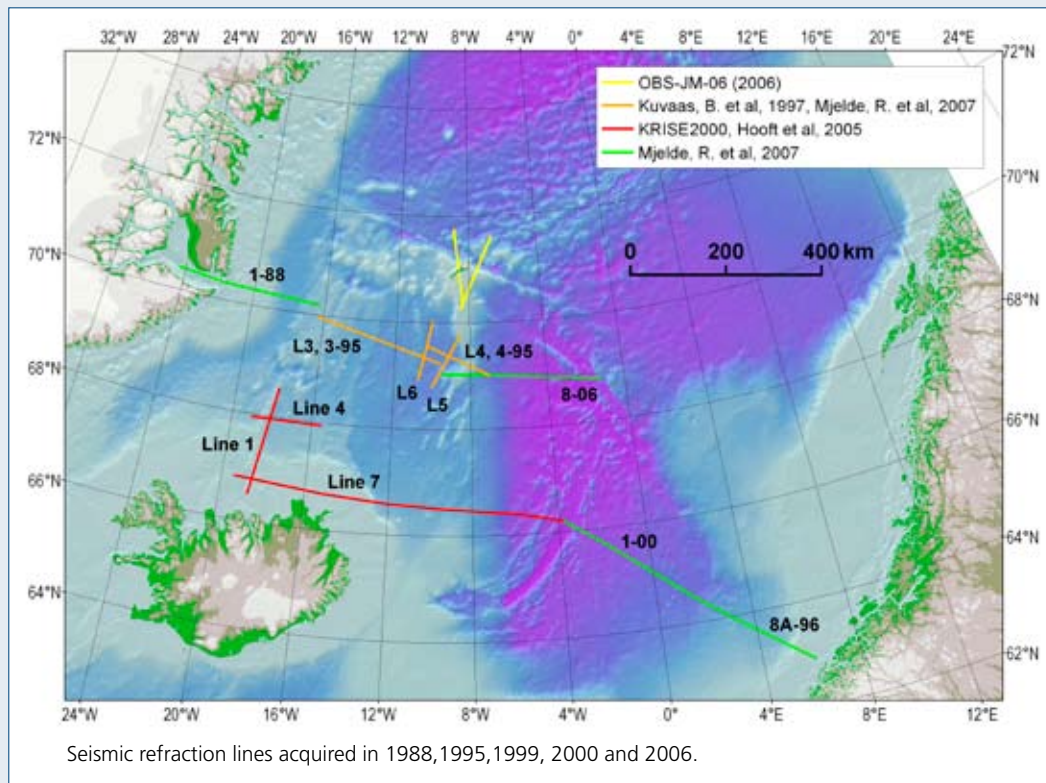


3600 km of seismic reflection lines acquired in 2001 and 2008 by CGGVeritas. 800 km acquired by TGS-NOPEC in 2002.

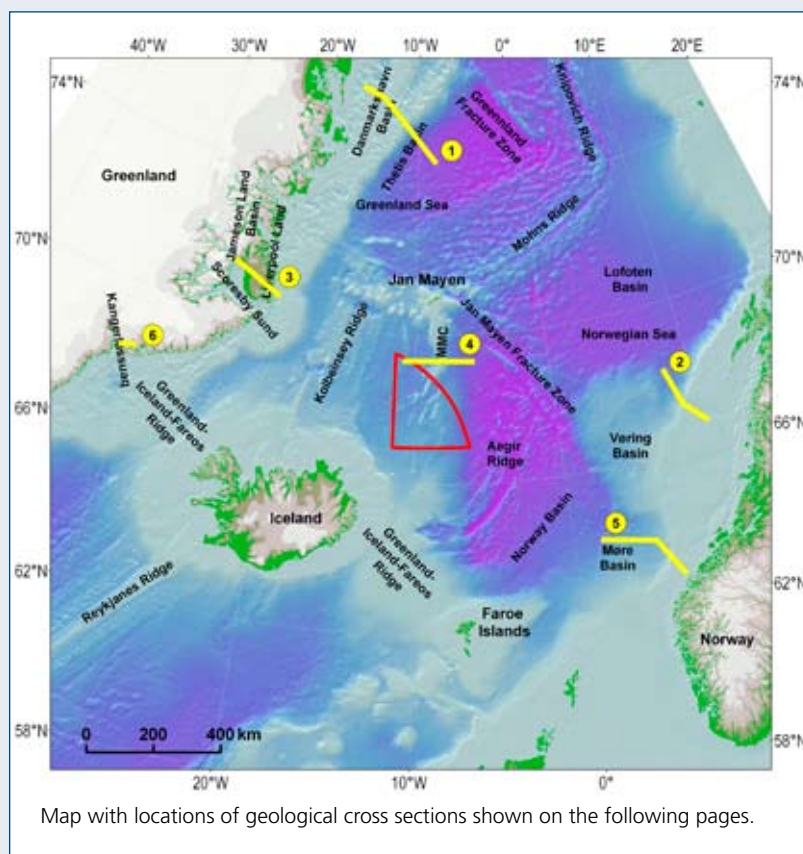


Location of shallow boreholes and seafloor samples.

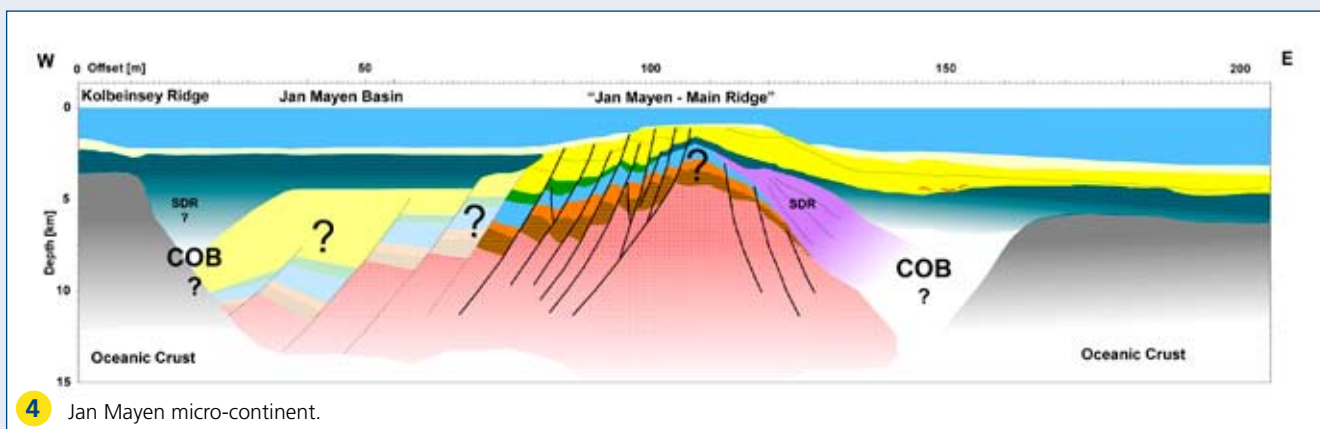
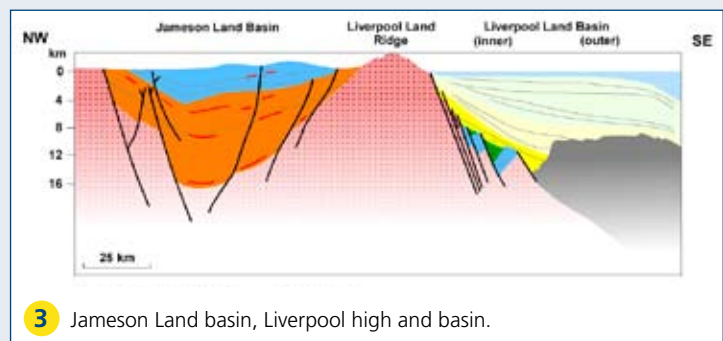
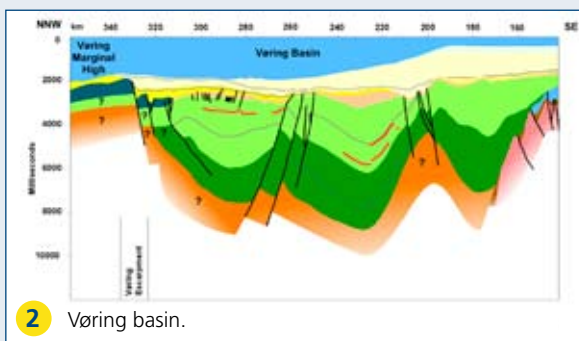
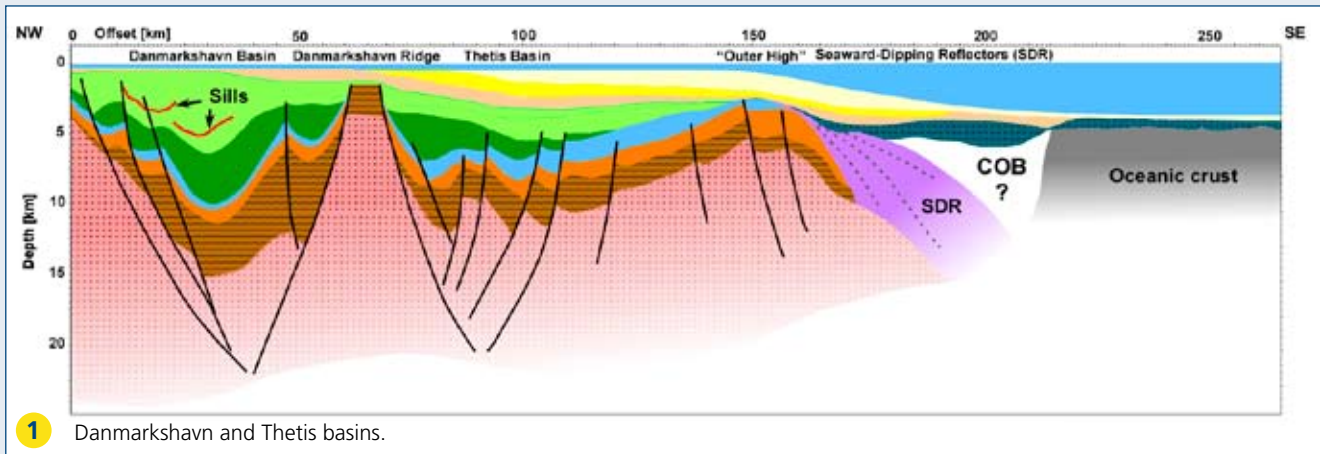


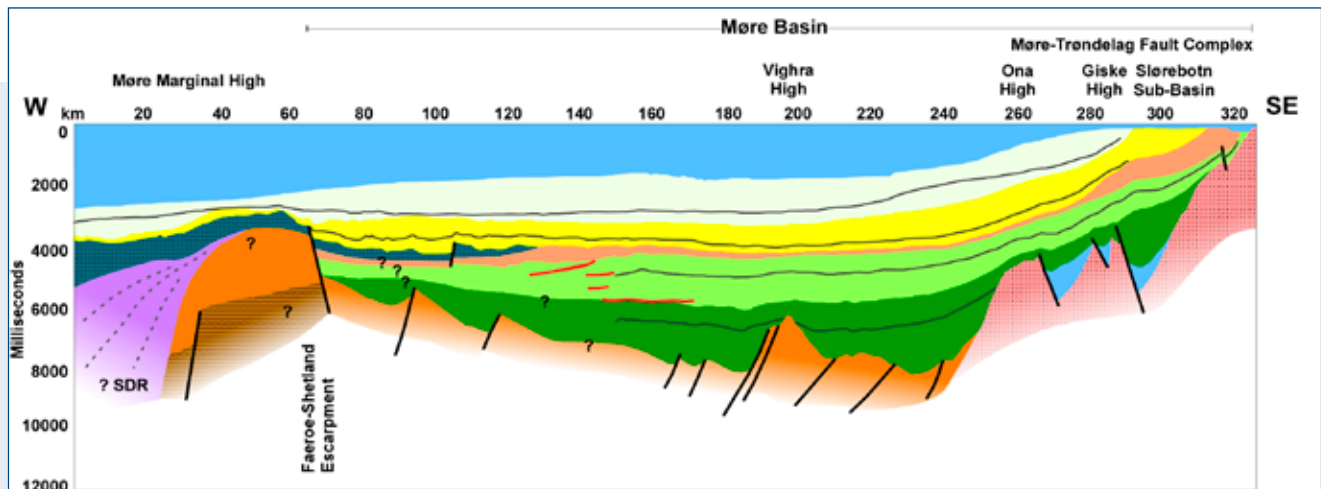


## Geological cross sections

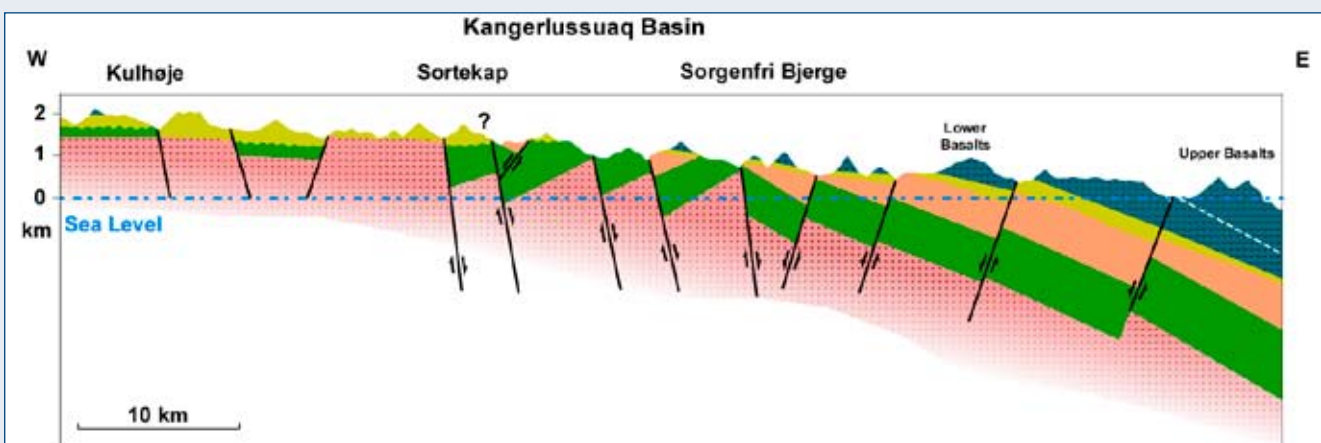


## Geological cross sections





5 Møre basin.



6 Kangerlussuaq basin.

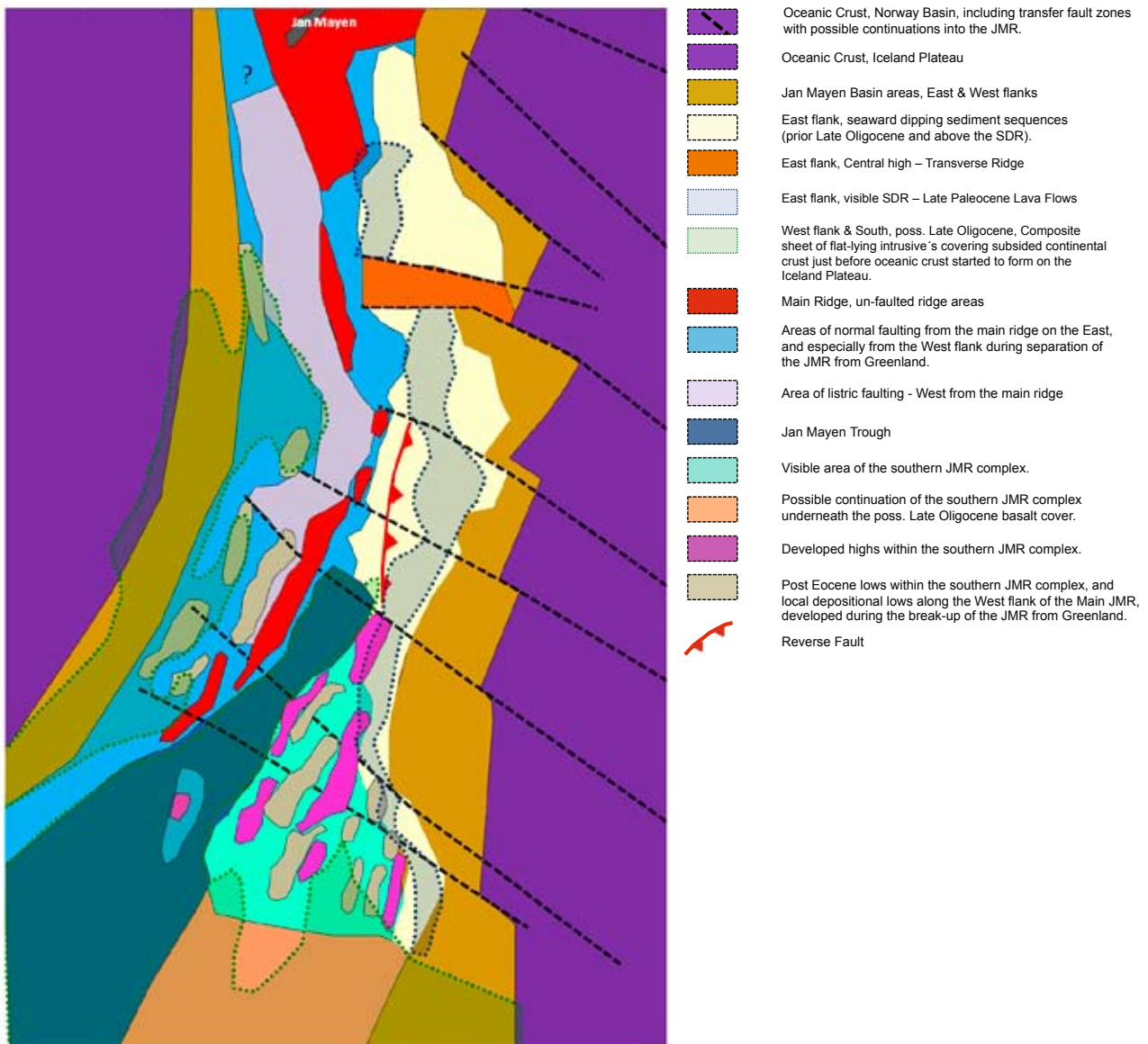
**Legend:**

	Intra Quaternary		Paleocene - Volcanics / Basalts
	Intra Quaternary to Middle Miocene (Mid Tertiary Unconformity)		Seaward-Dipping Reflectors (SDE)
	Middle Miocene (Mid Tertiary) to Top Paleocene (Early Tertiary)		Oceanic crust
	Middle Paleocene (Early Tertiary - Floodplain Sediments)		COB (Continental-Ocean Boundary)
	Lower Paleocene		Sills and dykes
	Upper Cretaceous		Fault Zones
	Mid Cretaceous		Unit subdivision, general formation dip direction
	Lower Cretaceous - BCU, Cretaceous undiff.		Unconformity
	Jurassic & Triassic		
	Permian - Devonian, Paleozoic undiff.		
	Paleozoic Basement		
	Caledonian Crystalline Basement		



## Hydrocarbon potential

- The Jan Mayen Ridge is a sliver of a continental crust on the Atlantic Margin.
- Sedimentary rocks are of sufficient thickness and age for hydrocarbon generation.
- Indications of sedimentary strata pre-dating the opening of the Norwegian-Greenland sea.
- Potential source rocks similar to East Greenland.
- Potential reservoir rocks, including submarine fans.
- Potential traps present, both structural and stratigraphic.
- Seismic anomalies and surface pockmarks indicating that hydrocarbons may be present.



Geological structure map of the Jan Mayen Ridge.



## Environmental conditions

- Mean summer temperatures 5 to 8°C, winter temperatures -2 to 0°C
- Yearly precipitation about 700 mm, winter lows with up to 25 to 30 cm daily snow.
- Mean summer wind speed ca 6 m/s, winter wind speed ca 10 m/s.
- Frequent fogs during summer
- Some occurrences of icing in the winter months.
- No danger of sea ice under present climatic conditions.
- Wave heights lower than at the west-coast of Norway, 100 year wave height about 12 m.
- Buoy for meteorology and wave conditions was operated for one year.
- Mooring with ADCP and traditional current meters for oceanography was operated for one year.
- Occasional catches of pelagic fish stocks (capelin, herring) in the area.
- No known demersal fish catches.
- Only relatively common species of whales and sea birds.
- Bathymetry and benthic fauna were investigated in summer 2008.

## Currents

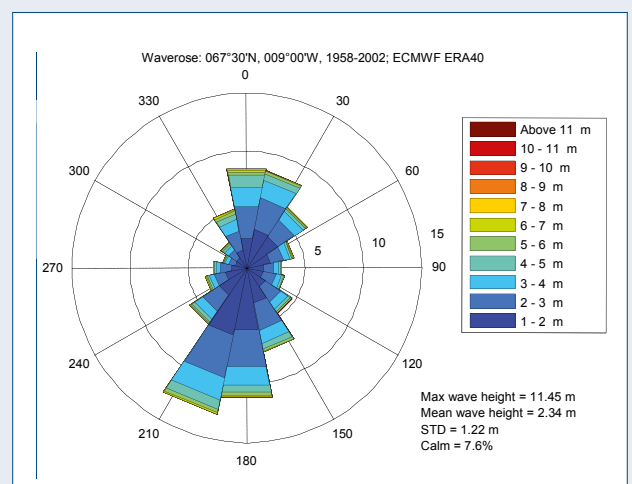
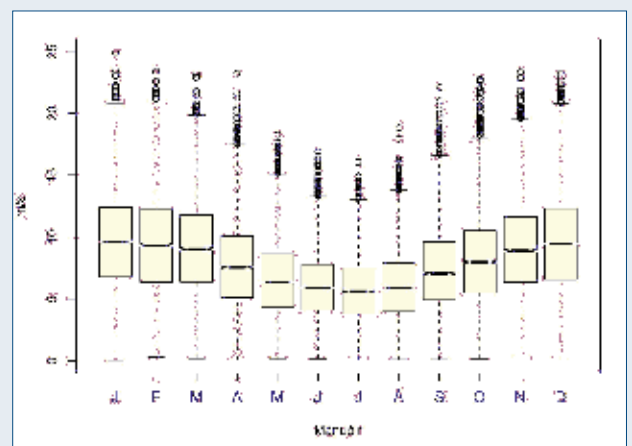
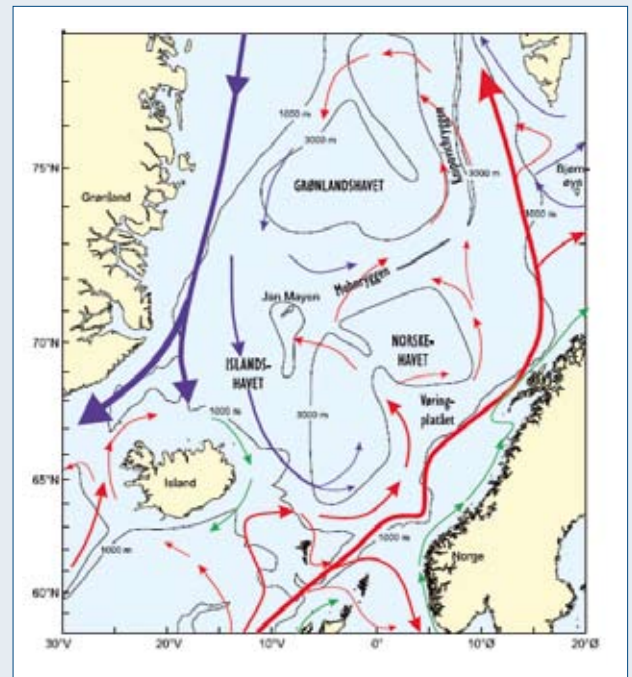
The area is within a cell of anticlockwise flowing, relatively weak branches from the cold and warm main ocean currents in the north and south.

## Wind speed

Distribution of wind speed in the Dreki area is shown for each month. Half of the observations are within the box, the median is shown with a horizontal mark.

## Wave heights

Wave heights in the Dreki area are lower than at the west-coast of Norway, 100 year wave height is about 12m. The main wave direction is from the SSW and S. Outliers are indicated by circles.

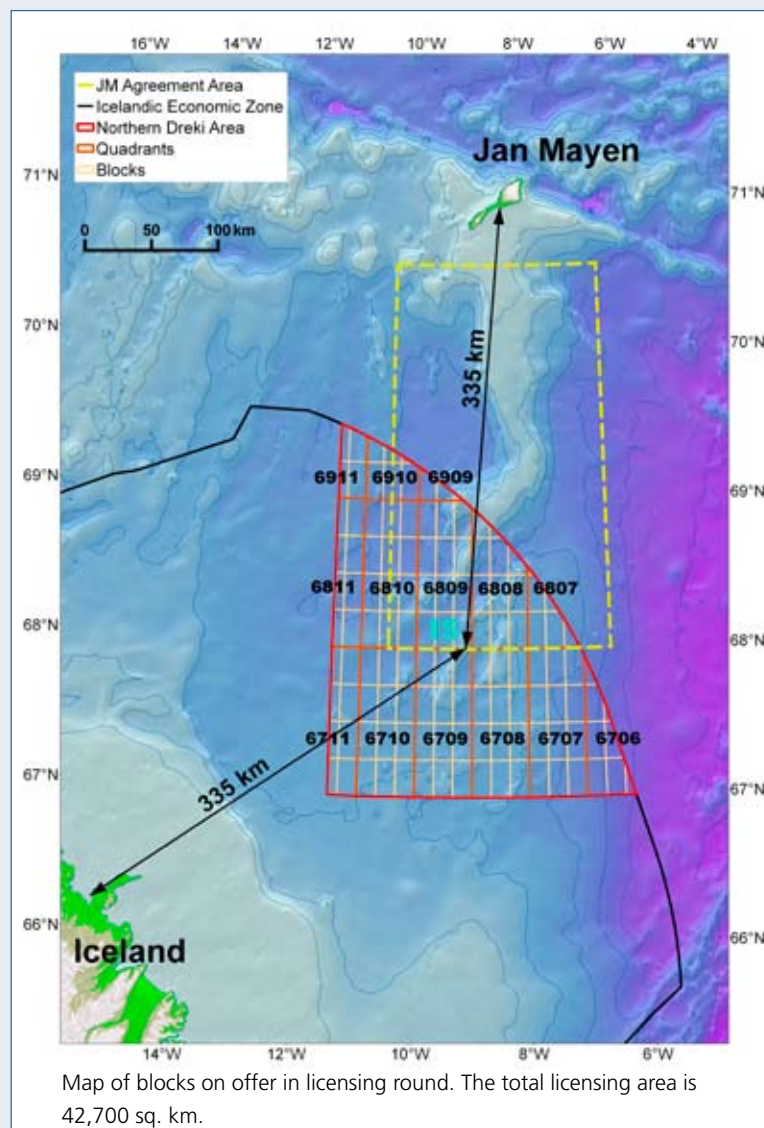


## Licensing for hydrocarbons

- Exclusive licenses for the exploration and production of hydrocarbons in the Dreki area are on offer in licensing rounds.
- Out-of-round applications may be taken into consideration according to article 8 (5) of the Hydrocarbons Act and Article 3 (3) of EU Directive 94/22/EC.
- Applications for prospecting licenses (e.g. for speculative surveys) accepted at any time.

## Licensing terms

- Duration of exploration licenses up to 12 years, may be prolonged to a maximum of 16 years.
- Following a successful exploration, a priority can be granted for a production license for up to 30 years.
- Group applications (joint ventures) are welcome, standard Joint Operating Agreement provided.
- Transferable licenses, subject to official permission.
- Phased work programme possible, each phase with separate specification of rights and obligations.
- Annual contribution to an education and research fund.
- Treaty with Norway on the northernmost 30% of the area (12,720 sq. km).
- Norway may participate with up to 25% share in exclusive licenses within the treaty area.





## Taxation of hydrocarbon extraction in Iceland

The Minister of Finance submitted before the Parliament, in the beginning of April 2011, two bills regarding the taxation of hydrocarbon extraction in Iceland. The bills' propositions are substantial amendments to the current tax regime of hydrocarbon extraction and if passed the tax regime will be based on the following four taxes/charges:

- a. **General Corporate Income Tax** which is currently 20% of the company's profit.
- b. **Area Fee** which is charged for concessions for exploration and production of hydrocarbons. For the first six years the permit is in force the licensee shall pay an annual fee of ISK 10,000 per sq. km of the concession area. The annual fee increases by ISK 10,000 per sq. km each year. However, the annual fee shall never exceed ISK 150,000 per sq. km. No area fee is paid for a prospecting license.
- c. **Production Levy** which is calculated on the market value of hydrocarbons processed from the resource. The levy rate is fixed at 5%. The levy is treated as a deductible operational cost.
- d. **Special Hydrocarbon Tax** which is levied on the profit that is generated by the activity. The tax rate is progressive relative to the profit ratio which is the ratio between the total income and the tax base. The tax rate of the special hydrocarbon tax, as a percentage is calculated as follows: profit ratio x 0.45. As an example; if the profit ratio is 40% the tax rate is 18% ( $40 \times 0.45$ ).

It is assumed that all the parties involved in hydrocarbon extraction will be liable to other taxes and other public dues that are normally levied in Iceland under the laws and regulations in force at any given time. However, there are several notable exceptions; the most important is that the hydrocarbon extraction activities will be exempt from VAT. Furthermore, rules on loss and depreciation in Iceland are favorable to the hydrocarbon industry.

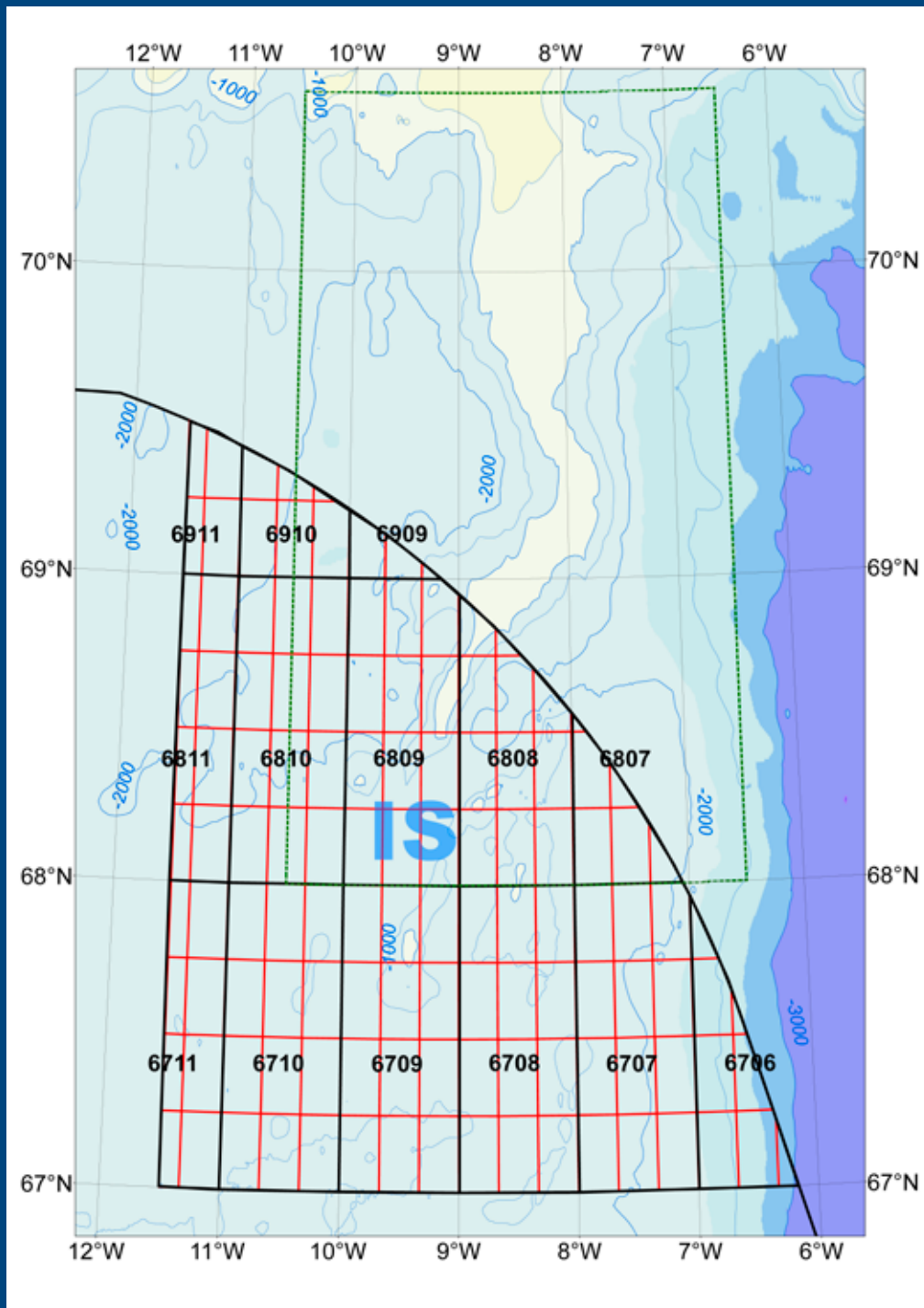


## Legal framework

- EU legislation has been transposed in many important areas into Icelandic law, as Iceland belongs, with Norway, Liechtenstein and the EU countries, to the European Economic Area (EEA).
- Icelandic Parliamentary Act No.13, 2001, on Prospecting, Exploration and Production of Hydrocarbons applies to petroleum activities.
  - Transposes into Icelandic law EU directive 94/22/EC on the conditions for granting and using authorizations for the prospecting, exploration and production of hydrocarbons.
- Other relevant EU legislation, including issues of health, safety and environment (HSE), has been transposed into Icelandic law.
- Iceland has ratified the OSPAR convention on the protection of the marine environment of the North-East Atlantic as well as the international MARPOL protocol for the prevention of pollution from ships.

## Facts about Iceland

- Republic with 320,000 inhabitants.
- Member of the Schengen Area and cooperation by a special agreement with the EU.
- Member of NATO, strong ties with North-Atlantic neighbours and other Nordic countries.



Northern Dreki Area on the Icelandic Continental Shelf between Iceland and Jan Mayen. The boundary of the Agreement Area from 1981 between Iceland and Norway shown by green, dotted line.