

Regional definition

This section describes the boundaries and the main physical and socio-economic characteristics of the region in order to define the area considered in the regional GIWA assessment and to provide sufficient background information to establish the context within which the assessment was conducted.

Boundaries of the region

Location and geography

The Faroe Islands are situated in the North Atlantic Ocean, between 61° 20' and 62° 24' northern latitude, and 6° 15' to 7° 41' western longitude. The islands are located approximately 430 kilometres to the south east of Iceland, and 300 kilometres to the north of Scotland.

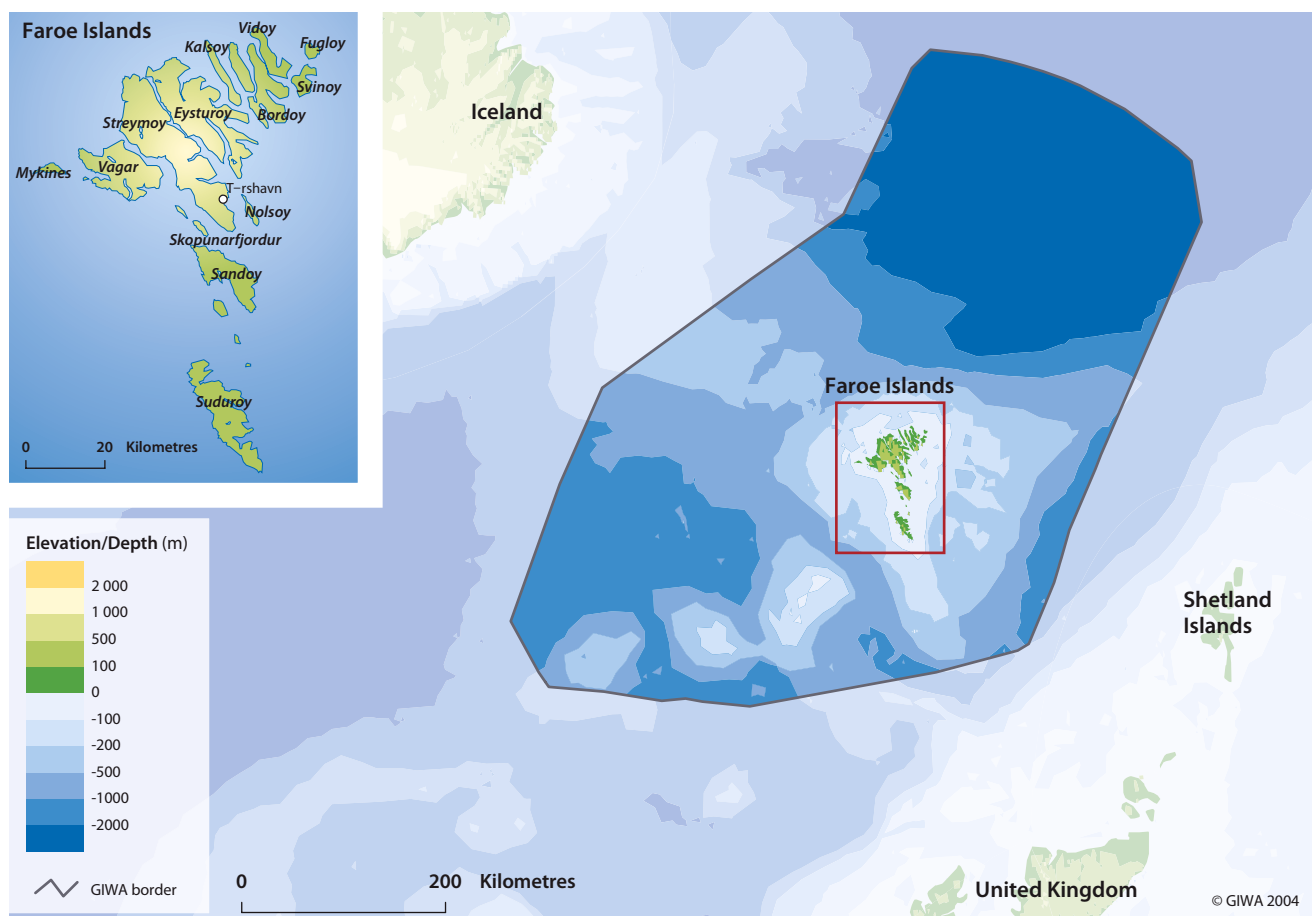


Figure 1 The Faroe Islands.

The Faroe Islands consist of 18 mountainous islands situated in the North Atlantic at about 62°N and 7°W. The islands extend over 113 km from north to south and 75 km from east to west, and the total land area is 1 399 km² (sea area is 274 000 km²) (Figure 1). The highest points, almost 890 metres above sea level, are on the northern islands. Seventeen of the islands are inhabited. The capital, Tórshavn, is situated on the largest island, Streymoy (376 km²), located in the south of the principal cluster of the northern islands.

The archipelago is volcanic in origin, forming part of the Wyville-Thompson ridge, which stretches in a north westerly direction from the British Isles to Greenland. The geological origins of the islands can be divided between the period of volcanic activity during which the basalt Plateau developed, and the subsequent period of erosion, including glacial formation during periods of ice age, which has given the islands their current distinctive features.

The Faroese fjords are oriented along a northwest to southeast trend, arising from the system of fissures through which the basalt Plateau was formed. The northern-most islands are characterised by very steep and high cliffs, with gently sloping terraces covered for the greater part by low-lying vegetation. Another distinctive feature of the Faroese coastline is the large number of gullies (gjógv), with steep walls that provide safe nesting areas for seabirds. The rapid coastal erosion on the west facing cliffs has led to the formation of stacks and skerries that are also safe nesting areas.

The majority of the Faroese shoreline is exposed to the direct action of the sea and there are few bays or sheltered lagoons. High cliffs are a dominant coastal feature and areas of sandy beach are rare, as are sand dunes, which are only present on the island of Sandoy. Safe anchorages are available in the narrow sounds between the islands and in fjords.

Physical characteristics

Climate

The climate in the Faroe Islands is strongly affected by the warm North Atlantic current and frequent passage of cyclones, which, depending on the location of the polar front, mainly come from southwest and west. The climate is characterised by mild winters and cool summers.

The high pressure over the Azores sometimes shifts towards the Faroe Islands. This can result in stable summer weather lasting several weeks, with quite high temperatures. In winter, on the other hand, the low

pressure systems can move further south around the islands than normal, bringing in cold air from the north and a lengthy period of sunny winter weather.

Despite their sub-arctic location, the Faroe Islands enjoy mild winters (lows averaging 4.1°C in February) and cool summers (with average highs of 11.1°C in August).

Average air temperatures remain above zero throughout the year in all parts of the islands, and temperatures seldom remain below zero for any length of time, though there is a high incidence of frost.

The sky is typically overcast (the overcast value averages 78%) and rainfall levels are high. Precipitation is recorded on an average of 280 days annually, and rainfall averages 1 461 mm annually.

Weather patterns are subject to abrupt and violent changes, and extreme wind forces are regularly recorded. Frequent sea fogs fill the valleys and low-lying coastal zones.

The offshore waters in the Faroe Islands region are modified by the surrounding oceanic water masses, which influence ambient water temperatures. Two major surface water currents transport water into the region. The Gulf Stream carries warm Atlantic water from the southwest and divides around the north and south of the islands. The second current (the East Icelandic Current) flows from the direction of Iceland in the northwest, bringing cold, plankton-rich water. The average surface water temperature is relatively stable, averaging between 10-11°C in the summer and 6-7.5°C in the winter.

The maritime climate is also a result of the cold East Icelandic Current (polar current), which splits into two currents from eastern Iceland towards the Faroe Islands. The mixing of the water masses from this and the warm Gulf Stream causes a relatively big difference in the sea temperatures around the islands, and this in turn causes local variations in the climate.

Freshwater

The Faroe Islands hold in most places plenty of unpolluted freshwater in several lakes and streams. According to Christoffersen (2002) the Faroe Islands are inhabited by the same groups of freshwater organisms as found elsewhere in the region, because of the similar (though not identical) pre-glacial history. However, overall diversity seems to be lower than in neighbouring areas, such as Shetland and Iceland, most likely due to the presence of dispersal barriers.

Today's most important anthropogenic effects are those of untreated wastewater and the agricultural practice of fertilisation of hay fields. The few studies so far conducted on lake chemistry indicate that eutrophication does occur (Christoffersen, 2002), but not at levels observed elsewhere (e.g. in Scandinavia).

During the 20th century the water level of a number of lakes was raised by damming of outlets to produce hydroelectric power and to ensure a sufficient drinking water supply. The effects of such regulations include flooding of wetlands and changes in the aquatic food webs due to the immediate disturbances as well as to changes in catchment size and the retention time of the lake water (Jensen et al., 1983). Some of these lakes are used for aquaculture smolt production which leads to eutrophication and difficulties in controlling fish-diseases. The present-day and early historic biodiversity and ecology of Faroese streams, ponds and lakes ought therefore to be investigated and described in detail before more marked and widespread changes occur, and the results obtained will be a useful tool in the hands of water management authorities when implementing water protective measures (Christoffersen, 2002).

On the five largest islands there are some 40 mountain lakes containing brown-trout (*Salmo trutta*). Sea trout is to be found in most of the water courses from mid June. Salmon (*Salmo salar*) and sea-trout can be caught in the bigger lakes on the islands. A natural population of Arctic char (*Salvelinus alpinus*) occurs in "Leynavatn" only. Salmons, trout's and Arctic char are exploited by sports fishing only, and there are no imminent threats to these fish stocks from overfishing or pollution (A. Reinert, Fiskaaling, Faroe Islands, pers. comm.)

Oceanography and the marine ecosystem

The following description of the physical oceanography and marine ecosystem of the Faroese Plateau is from a recent comprehensive description given in Dam et al. (2000) and Jákupsstovu et al. (2003). For detailed descriptions see e.g. Hansen et al. (1998), Olsen (1998, 2001), Hansen and Østerhus (2000), Bloch et al. (2001), Gaard et al. (2002), Hoydal and Dam (2003).

Faroese waters are divided into two parts by a series of ridges that are part of the Greenland-Scotland Ridge (Figure 2). On both sides of the ridge, bottom depths exceed 1500 m while the ridge itself has typical sill depths around 500 m. The Atlantic sector, southwest of the ridge, includes a number of banks. Northeast of the ridge, the Norwegian Sea extends to depths more than 3000 m in the Faroese area.

In the surface, most of the area is covered by warm, saline Atlantic

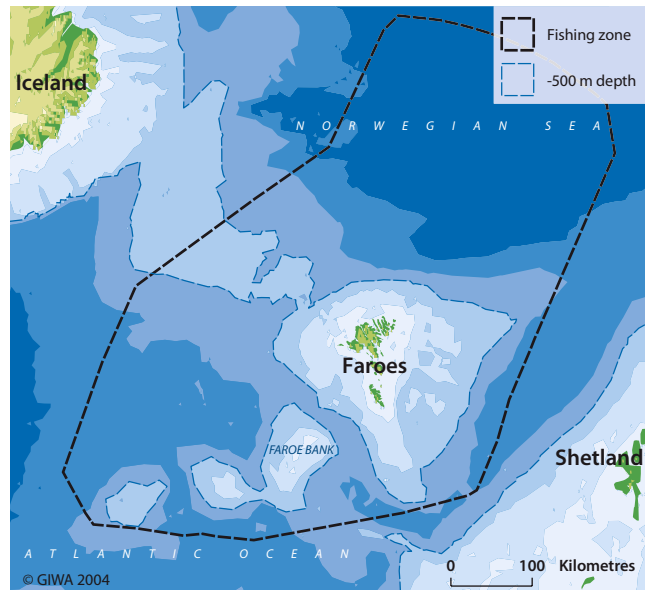


Figure 2 Faroese waters may be defined as the ocean area within the Faroese fishing zone.
(Source: Jákupsstovu et al., 2003)

waters that flow past the Faroes into the Norwegian Sea. Only in the northernmost part are Faroese surface waters affected by cold, less saline, Arctic water masses that are carried into the area by the East Icelandic Current.

The relatively homogeneous character of the surface waters disappears at greater depths. In the Atlantic sector, southwest of the ridge, warm (and saline) water extends to great depths while the northeastern sector is dominated by cold (<0°C) and less saline water from around sill level and down to the bottom. At depths below the sill, the two regions therefore exhibit quite different characteristics (Figure 3).

In mostly all directions out from the Faroes, we therefore find warm, saline Atlantic water in the upper layers and cold, less saline water at depth. In between, water from the East Icelandic Current may often be identified as a salinity minimum, especially on the eastern side of the Faroe Plateau.

This introduces an east-west asymmetry, especially at intermediate depths. The interface between the warm upper layers and the colder layers below is typically found at some 400-600 m depth, but may vary considerably which introduces large variations of the bottom temperature at these depths.

As a whole, Faroese waters exhibit a fairly diverse and fairly variable character. Both the characteristics and the flow patterns, in the surface,

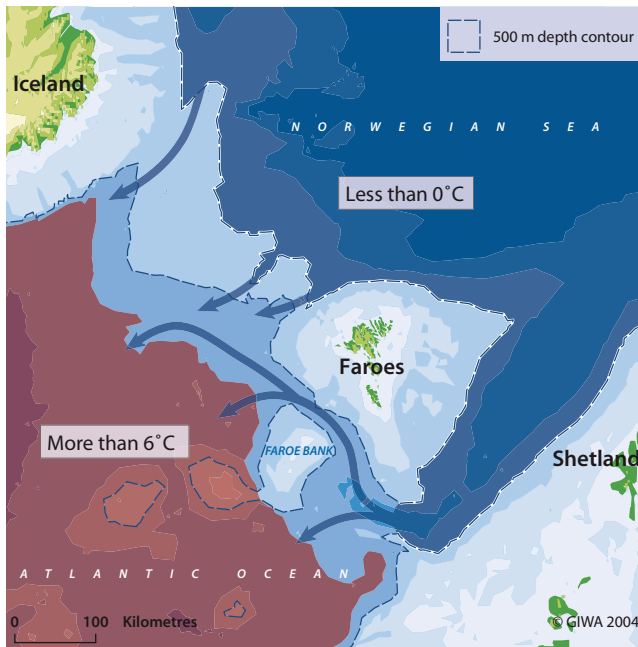


Figure 3 At depths about 600-800 m, there is a large difference in temperature (and salinity) between the two regimes on either side of the ridge. There is, however, an overflow of cold water across the ridge that influences conditions in the Atlantic sector.
(Source: Jákupsstovu et al., 2003)

as well as at depth, are determined by the thermohaline ventilation processes, occurring further north in the Arctic Mediterranean. These processes generate the cold waters that flow past the Faroes at depth and the compensating inflow of warm Atlantic water in the surface. How these processes will change with global climate change will determine the sea climate of Faroese waters in the future.

Productivity

The Faroe Islands are surrounded by a shelf, which is approximately described by its 200 m bottom contour. The 200 m bottom contour occupies about 21 000 km², and the width of the shelf varies greatly around the islands (Figure 2). It is only about 12 km wide east of the southernmost island and approximately 50 km wide in the northwest direction. In some areas the topography is smooth with a well-defined shelf break, and in others it is irregular or continuously sloping without a shelf break.

Because of strong tides, the on-shelf water is well mixed throughout the year, while the off-shelf water can be stratified in the summer season. In winter the cooling is on the other hand more efficient on the shelf. This creates a temperature front, not only in the summer season, but also throughout most of the year, except for the period October/November. The temperature front is most pronounced in the spring before the

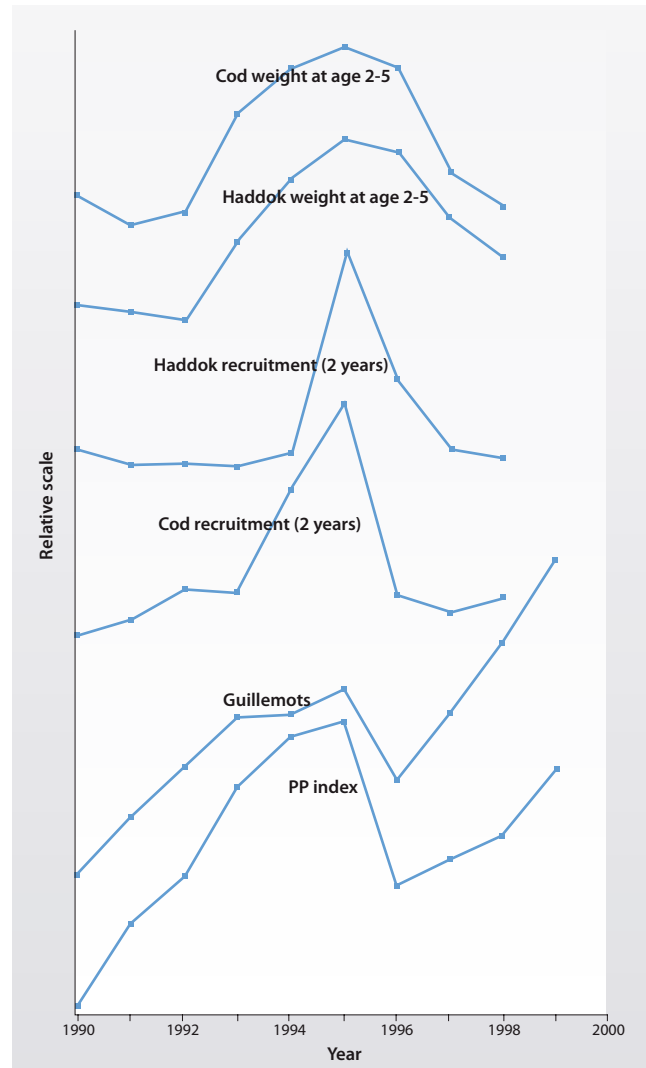


Figure 4 Relative variability in calculated new primary production, number of attending guillemots, recruitment of 2 year-old cod and haddock and mean weight of 2-5 year-old cod and haddock during 1990-1999.
(Source: Gaard et al., 2002)

onset of off-shelf stratification, and least pronounced or non-existing in the autumn, when the stratification is broken down.

The water inside the front occupies a special role in the Faroese marine ecosystem (Gaard et al., 2002) and is an important nursery area for larvae of many commercially important fish stocks. The productivity of the Faroese waters was very low in the late 1980s and early 1990s. This applies also to the recruitment of many fish stocks, and the growth of the fish was poor as well. From 1992 onwards the conditions have returned to more normal values, which is also reflected in the fish landings. A very clear relationship, from primary production to the

higher trophic levels (including fish and seabirds) has been observed in the Faroe shelf ecosystem, and all trophic levels seem to respond quickly to variability in primary production in the ecosystem (Figure 4; Gaard et al., 2002; Steingrund et al., 2003).

Benthos

Most recently, benthos investigations were performed in Faroese waters during the BIOFAR programme initiated in 1988 to cover the EEZ at depths from 100 – 1000 m depth (Nørrevang et al. 1994, Sørensen 2003, Tendal et al. (in press)). This was a joint inter-Nordic effort with cruise-participants from Denmark, Iceland, The Faroe Islands, Norway and Sweden. The material collected was worked up mainly by specialists from these and other countries bordering the NE-Atlantic, but also by some from USA. The two main objectives were to generate a list as complete as possible of benthic invertebrate species (macrofauna), and to obtain a survey of species distribution in relation to various physical parameters, especially current, temperature, salinity and depth. In 1995, the BIOFAR programme was extended to cover also shallow waters from 0-100 m.

Both earlier literature and the more than 100 scientific papers so far published in connection with BIOFAR confirm that the fauna is mainly boreal-arctic with many distribution patterns following water mass characteristics (bibliography in Bruntse and Tendal 2001). Biologically important results are the demonstration of hyperbenthos being rich and abundant all around the Faroes, and of big concentrations of biomass dominated by one or a few large-sized species of corals or sponges in many places on or near the shelf margin (articles in Bruntse and Tendal 2001; Tendal et al. (in press)).

Fish

The fish fauna in Faroese waters is diverse mainly due to the special bottom topography and the very different water masses in the area. The fish fauna is mainly boreal but occurrence of arctic as well as of Mediterranean species illustrate the composite nature of the area (Reinert, 2003). About 18 fish species have their north westerly boundary at the Faroes. In total, about 170 different fish species have been recorded for the area. The commercially most important fish species are: cod (*Gadus morhua*), haddock (*Melanogrammus aeglefinus*), saithe (*Pollachius virens*), tusk (*Brosme brosme*), ling (*Molva molva*), angler fish (monkfish) (*Lophius piscatorius*), Greenland halibut (*Reinhardtius hippoglossoides*), redfish (*Sebastes* spp.), blue whiting (*Micromesistius poutassou*), herring (*Clupea harengus*), mackerel (*Scomber scombrus*), halibut (*Hippoglossus hippoglossus*), silver smelt (*Argentina* spp.), blue ling (*Molva dypterygia*), and others.

There exist several local self-sustained fish stocks in the area (Faroe Plateau cod, Faroe Bank cod, Faroe haddock, Norway Pout, small redfish etc.); others perform limited migrations in and out of the area but are in assessments/management regarded as local stocks (saithe, halibut, ling, tusk etc.) while many others belong to stocks with a wider distribution area (golden redfish, deep-sea redfish, blue ling, Greenland halibut etc.) or are stocks migrating to and/or through Faroese waters (herring, blue whiting, mackerel, horse mackerel, salmon, blue-fin tuna etc.).

Seabirds

Nearly 2 million pairs of seabirds breed in the Faroe Islands (Olsen, 2003). As seabirds begin breeding only at 5-12 years of age there is also a very large number of sub-adult birds. In total there may be about 5 million Faroese seabirds with a total biomass around 3 000 tonnes, consuming about 300 000 tonnes/year. Four of the 21 species make up 95% of the total biomass. These are the fulmar (*Fulmarus glacialis*) (48%), puffin (*Fratercula arctica*) (21%), guillemot (*Uria lomvia*) (17%) and kittiwake (*Rissa tridactyla*) (9%). The fulmar is the most abundant and widespread species of seabird in the North Atlantic and numbers have increased dramatically over the last 250 years although the reason is unknown. It seems clear that the fulmar nested, really for the first time in the Faroes, some time between 1816 and 1839. Many of the seabirds migrate or disperse from the Faroese waters after the breeding season but the fulmar is in Faroese waters all year round (Olsen, 2003). The Fulmar in the Atlantic has shown one of the most remarkable range expansions and population explosions known in seabirds, yet the reason for the increase are still unclear. Explanations include the provision of extra food for fulmars, first in the form of offal from whaling fleets and later as discarded fish from trawlers.

Marine mammals

During the last two centuries 27 marine mammal species have been recorded in Faroese waters: seven pinniped and 20 cetacean species (Bloch, 1998; Bloch et al., 2001). Grey seal (*Halichoerus grypus*) and harbour porpoise (*Phocoena phocoena*) are the only species occurring permanently inshore in Faroese waters.

The Faroese grey seal population seems to be related to grey seals from the Scotland-Orkney area (Mikkelsen et al., 2002). The following species are observed offshore year round as well as migrating: Fin whale (*Balaenoptera physalus*), minke whale (*B. acutorostrata*), sperm whale (*Physeter macrocephalus*), bottlenose whale (*Hyperoodon ampullatus*), long-finned pilot whale (*Globicephala melas*), killer whale (*Orcinus orca*), and white-sided dolphin (*Lagenorhynchus acutus*). Of the remaining 18 species, some migrate into and stay only temporarily in Faroese waters: Harp seal (*Phoca groenlandica*), hooded seal (*Cystophora cristata*), blue

Cod, haddock, saithe and other demersal stocks form the economically most important component of the Faroese fishing industry. The landings of cod, haddock and saithe, were at a historically low level during the late 1980s and early 1990s that caused a severe economic crisis for the fish industry and the entire Faroese society. The landings recovered rapidly during the mid 1990s due to improved recruitment and growth (ICES, 2003). Changes in primary production in the marine ecosystem and in the food availability for cod was most probably the driving force behind the collapse of the cod stock in 1991 as well as its rapid recovery in 1995 (Steingrund et al., 2003).

The fisheries in the Faroe area can be characterised as multigear and multispecies, targeting demersal, deep-water and pelagic species using hand lines, long lines, gillnets, purse seine and various trawl gear types (Reinert, 2001a). Before 1960, all foreign vessels were allowed to fish around the Faroe Islands outside the 3-nm zone. Since the introduction of the 200 nm fisheries zone in 1977, the demersal fishery by foreign nations has decreased and Faroese vessels now take most of the demersal catches (Table 2).

Table 2 Total catch in Faroese waters by nation, ICES area Vb*, in 2001.

Species	Total catch in Faroese waters 2001 (tonnes live weight)						Faroese catch (%)
	Faroe Islands	UK/Germany	France	Norway	Other	Total	
Blue whiting	126 915	-	4 537	47 340	261 134	443 211	27
Other	153 791	309	2 841	137	8 831	165 980	93
Saithe	44 500	1 303	840	56	226	46 925	95
Cod	26 768	337	11	601	20	27 736	97
Haddock	14 246	135	6	347	0	14 733	97
Tusk (Ling, Blue ling)	5 552	130	398	4 051	7	10 138	55
Redfish	5 332	168	198	16	20	5 734	93
Total	377 104	2 381	8 831	52 546	270 237	714 385	53

Note: * ICES area Vb = *Føroya Banki and continental shelf.* (From Hagstova, 2003)

The main components of the pelagic fisheries (both foreign and domestic fleets) comprise blue whiting, Atlanto-Scandian herring and mackerel. Blue whiting is caught from the Barents Sea to the Strait of Gibraltar, and the stock was perceived to be relatively constant since the early 1980s, although estimates of abundance are imprecise. Since the end of the 1990s the spawning stock biomass has increased significantly to 4.3 million tonnes in 2003, a record high value (ICES, 2004a). In Faroe waters (ICES area Vb and IIa) blue whiting is caught primarily by Russian, Icelandic, Faroese and Norwegian vessels, and Faroese caught about 27% of the 2001 catch (Table 2). The Faroese catch of blue whiting in 2002 was around 500 thousand tonnes (or 31%) of a total 1.6 million tonnes taken in the North Atlantic (ICES, 2003a).

Sea bird hunting

Seabirds are caught for local consumption. Fulmars and puffins are the most important species and it is estimated that 50 000-100 000 birds are caught each year from each of these populations.

Whale hunting

In contrast to the fishery, which has enormous economic importance, whaling is a non-commercial hunt only intended for domestic use, however still of economic value. Whaling does, however, represent a valuable food source, which in the period 2000-2003 with an annual catch of between 539 and 917 pilot whales provided on average between 2.5 and 4.5 kg of whale meat per person, the actual consumption however, is assumed to be uneven, see also Table 4, p. 26 (Museum of Natural History's archive). The catch is organised according to laws and regulations adjusted from time to time, and the conservation of marine mammals in the Faroe Islands is managed through membership in the North Atlantic Marine Mammal Commission (NAMMCO).

The average annual catch over the last 400 years of the different species is 845 pilot whales, 2 bottlenose whales and 60 white-sided dolphins as the most common and regularly taken species (Bloch, 1996a, and Faroese Museum of Natural History archive).

The pilot whale is a small toothed whale found in large schools in the North Atlantic. The Faroese pilot whale catch is a traditional, communal, non-commercial hunt aimed at meeting the community's need for whale meat and blubber. The pilot whale catch proceeds as follows: A school of pilot whales, observed near the coast, is driven into a fjord and beached, preferably on a flat stretch. Only a limited number of beaches (23) are approved for whaling and authorised by law. The whales are killed by cutting the spinal cord and in the same cut, the arteries supplying the brain are cut (Bloch, 1996b). The authorities distribute the meat and blubber according to traditional rules, the main rule being equal shares for all the inhabitants of the district.

Mariculture

The production especially of Atlantic salmon (*Salmo salar*) and to a minor extent the rainbow trout (*Oncorhynchus mykiss*) has increased rapidly during the last two decades to more than 45 000 tonnes in 2002 (Hagstova, 2003). The demand for freshwater smolt production is secured by placing the tanks in artificial streams or, less desirable, directly into natural sections of rivers. The pharmaceuticals used in the industry are regulated and subject to controls. The smolt is vaccinated and its skin disinfected before being transferred into cages, to reduce the risk of disease. In the mid 1990s, epidemics of the BKD (kidney disease) were the most severe medical problem (Dam et al., 2000). The

other main indication treated with pharmaceuticals is the salmon lice (*Lepeophtherius salmonis* and *Caligus elongates*). The origin of the breed of Atlantic salmon now in production in the Faroes was roe imported from Norway in the period 1978-1984.

Socio-economic characteristics

Political structure

The Faroese descend from Norwegian and Celtic settlers, who arrived at least as early as the 9th Century A.D. Most of the legislative and executive governmental powers lie with the Faroese authorities, the Løgting (parliament) and the Landsstýri (executive branches of government) in Tórshavn, the capital. Environmental protection, including protection of the marine environment, is under Faroese jurisdiction, and is administered by the Ministry of Interior. The Faroese Maritime Authority, the Faroese coast guard and the Marine Rescue Coordination Centre (MRCC) lie with the Ministry of Fisheries and Maritime Affairs.

The Faroes as a political entity can be described as a miniature of a Nordic democracy. Being a self-governing territory under the state sovereignty of Denmark, there is a division of powers between the Faroes and Denmark within the framework of the home rule system. Some areas of relevance to the administration of marine affairs still are under Danish authority. Foreign affairs and defence are administered from Copenhagen, though the Faroese Government maintains its own Foreign Service as a department under the Faroese Prime Minister's Office. The Faroese Foreign Service maintains three missions abroad, in Brussels, Copenhagen and London. The missions in Brussels and London respectively are organised as part of the Danish embassies there. Denmark is represented by a High Commissioner in Tórshavn.

The Faroes are not a member of the European Union (EU), and decide themselves what international obligations entered by Denmark shall apply to them. In 2002 the Faroes obtained associated membership of the International Maritime Organization (IMO), and there are plans for further Faroese engagement in international relations.

Under the provisions of the Home Rule Act of 1948 Danish legislation on joint (Danish Realm) matters passed by the Danish parliament (the Folketing) must be ratified by the Faroese parliament to be applicable to the Faroes.

The fishery in the Faroese waters is regulated by the Faroese Ministry of Fisheries and Maritime Affairs which sets the quotas with reference

to advice issued by ICES. Denmark is, on behalf of the Faroes and Greenland, a member of ICES, NEAFC and NAFO. Denmark has ratified the agreement on protecting the North Atlantic salmon under NASCO on behalf of both the Faroe and Greenland.

The Environmental Department at the Food and Environmental Agency is the central body of administration of the Environmental Act and the new Marine Environmental Act. The coastguard, the Faroes Inspection and Rescue Service, oversees compliance with the Marine Environmental Act.

Population

In 2002 the Faroe Islands had a population of about 47 350 – an increase of 5 500 since 1977 (Hagstova, 2003). In 2002 the capital, Tórshavn, had a population of 18 420 corresponding to slightly less than 40% of the entire population.

Recent population change has been characterised by migratory movements. In the 1970s and 1980s there was a steady immigration, largely consisting of Faroese expatriates returning because of improved employment opportunities and rising real incomes. Net immigration was relatively small up to the beginning of the 1980s but increased relatively sharply in the years 1984-89 as a consequence of a high level of economic and employment activity. In 1993 the migratory flows reversed and the population fell by 1 956 (over 4%) in two years. Since 1996 the flow has changed again, and the population level at the end of 1999 was higher than the pre-crisis level.

The characteristics of population and demographic change lie at the heart of the social and economic development. There is agreement across the Faroese political spectrum on the goal of retaining viable populations on all of the currently inhabited islands (Anon., 2001). This is not an easy task, because employment opportunities are scarce on the remote islands and the delivery of key services such as education and special health care is expensive.

Although the buoyant economic conditions of the past four to five years have encouraged net inwards migration to the Islands, within the region itself the long-term trend shows a continual move from the peripheral islands towards the centres of economic activity in urban and peri-urban areas of Tórshavn, Runavík (Eysturoy) and Klaksvík (Borðoy).

Population projections prepared by Hagstova Føroyar (the Faroese Statistical Office) for the period 2000 to 2024 indicate a potential population increase of approximately 26% over that period due to birth rate and migration. The majority of that growth is projected to occur

in the urban and peri-urban areas around Tórshavn, south Esturoy and Klaksvík, and the projected growth rates for Sandoy and Suðuroy are significantly below average.

Economy and business

The Faroe Islands use the Danish currency and are part of the Danish currency area, although they have their own notes.

The Faroe Islands is an industrialised country with a standard of living comparable with the other Nordic countries. The economy is mainly founded on the fishing industry and sea farming. In addition there are subsidies from Denmark that tend to diminish in importance with the development of the Faroese economy.

Any economy based on only two industries is bound to be vulnerable to the cyclical change in those industries, especially when both are related to the fishing industry. Prices and catches are volatile and these have left their mark on the economic history of the islands. This vulnerability is partly encountered by a geographically spreading of the catches all over the North Atlantic area and in other seas as well, such as the Barents Sea, which is made possible by fishery agreements between the Faroes and Norway, the EU and the Russian Federation.

The Faroese economy can be characterised as a mono-economy that is very dependent on the fishing industry. This statement is supported in the export account, of which fish products on average account for more than 95% of the export value (Anon., 2003a). The figure may be somewhat exaggerated due to incomplete export statistics for non-fish products.

Efforts to diversify the economy have been made, but so far without any notable success. Since nearly all the fish products are exported, the Faroese economy is very sensitive to the market. Consequently, the export income can fluctuate significantly from one year to the next because of changes in catch and price, and these fluctuations spread quickly throughout the economy.

The current level of reliance upon fishing and fish processing leaves the Islands exposed to external economic conditions. A variety of indicators point to the vulnerability that such exposure imposes upon the Faroe Islands, arising from (Anon., 2001):

- The high level of dependence upon foreign trade;
- The degree of dependence upon the export earnings of a narrow range of products;
- The extent to which the principal export industry (fishing) is exposed to externally controlled regulation;

- The inability of the Faroese suppliers to influence the traded prices of their principal exports;
- The possibility of risks posed to fish stocks and to the image of Faroese products by overfishing, disease and pollution.

Since 1995 the Faroese economy has grown rapidly, due particularly to strong growth in fisheries and aquaculture. From 2000 to 2001 exports increased by 12% to 4.1 billion, while imports fell by 3.5%, resulting in a surplus of DKK 211 million on the balance of trade. About 80% of exports from the Faroe Islands go to EU countries. Of this, Denmark accounts for 25% and the UK for 18%. In the last few years, the Faroe Islands have turned a net foreign debt into a net credit balance, although with a big difference between the private and the public sector. At the end of 2001 the private sector had a net credit balance of more than DKK 5 billion, while the public sector's net foreign debt stood at almost DKK 3 billion. Unemployment has fallen sharply in the last few years and is now around 3%.

The subsidy from Denmark steadily grew over the years up to 2002. During the depression years of 1991 - 1994, the Danish state transfer in percentage terms increased to almost a quarter of the Gross Domestic Product (GDP), but by 2002 it had decreased to about 8% of GDP as a result of the Faroese Government's policy to reduce economic dependency upon Danish subsidies. Prior to the economic depression, the Faroese Gross National Income (GNI) per capita was above the Danish GNI per capita, due to the Danish Government subsidy. Now the GNI per capita is lower.

More than a quarter of GDP comes from the fishing and fish processing industries. The fishing industry is also the basis for other sectors, such as shipyards and industries equipping the fishing industry.

The Faroese fishing industry

Fishing is the most important industry in the Islands and contributes over one quarter of national income. Most of the output is exported, making the industry and the Faroese economy highly susceptible to fluctuations in catch and to the world price of fish. The industry is a major employer particularly in peripheral regions.

The shipyards in the Faroes do most of the repairing of the Faroese fishing vessels. In addition the shipyards also do some repairing of vessels from Iceland and occasionally from Greenland. From time to time the shipyards also engage in constructing of fishing and special vessels. There has been a longstanding desire to diversify the Faroese economy but until now with no major effect. For the time being a committee is investigating how to establish a research environment

covering biotechnology and IT with the intention to boost development in those two industrial areas.

Before the mid-1970s, the Faroese fishery was mainly based on fishing in foreign waters. The extension of national fishing boundaries, however, necessitated to a significant degree a re-organisation of the Faroese fishing industry towards exploiting the resources in Faroese territorial waters. Today, about 40% of the fish export value still comes from fishing in foreign and international waters, although most of the fishing in foreign waters is reimbursed by reciprocal rights in Faroese territorial waters.

The harvesting sector is the largest in terms of income and employment but the recent relatively high levels of profitability have been insufficient to encourage investment in modern vessels. The Faroese fishing fleet comprises around 670 vessels but the majority of the catch is taken by the 182 vessels larger than 20 GRT. The sector is considered to be overcapitalised but there is reluctance to encourage fleet reduction because this will lead to a concentration of fishing activity and a concomitant reduction of employment opportunities.

Before World War 2 subsidies to the Faroe fishing industry came from the Danish Government. After 1948 and the establishment of the Faroe Home Rule political competence and responsibility for subsidies to the fishing industry have been transferred from Danish political authorities to Faroese political authorities. From the 1950s subsidies have been given to shipbuilding and to a prize guarantee on fish for the fishing fleets. From 1998 fishing vessels do no longer receive direct support; however, they are supported indirectly by a guarantee from the "Ráfiskefonden" (a Fishing Foundation established in 1975) to the fishermen of a minimum salary and daily support as well as a secured salary during illness. Beginning in the early 1970s, the fishing industry also became increasingly subsidised and this twisted the market forces in unfortunate ways. Finally in 1992, the subsidies were replaced by a capital subsidy and later in 1998, removed altogether. Now the fishing industry relies very little on subsidies, although some indirect measures have been introduced instead.

In the late 1980s, a condemnation plan was initiated whereby the ship owners were paid to give up their fishing vessels. The intent of this plan was to increase the catch for each remaining vessel and in the end, increase the competitiveness and the total catch. During the crisis in the first half of the 1990s, many vessels were sold out of the Faroese fishing fleet. This resulted in a capacity reduction of around 30%.

Approaching the mid-1990s, the cod stock turned out to be in better shape than previously estimated and the catch of cod increased

gradually from 1993 to 1997. The export value, however, did not increase as much because a large portion of the export was unprocessed fish. Over a five-year period, this has changed partly because of more local processing, but more specifically because of a general increase in world market prices, especially for cod (Anon., 2003a).

Fisheries management

Quotas (TAC) were introduced by law in 1994, but by June 1996 the quotas were replaced by a new fisheries management system which regulates the fishery by "Fishing Days" and area closures (see chapter 2.4). The new system focuses on viability and takes into account the differences in fishing gear and relative size of the vessels. The number of Fishing Days in a fishing year (commencing on 1 September) is set by law on the recommendation of an advisory board, comprised of representatives from in and around the industry. The recommendation is based on estimates of the fish stocks and the level of fishing effort. Each ship within each group thus gets a certain number of fishing days in which it may fish. Fishing days are partly tradable.

The advantages of a fishing-days system compared to a quota system are mainly that vessels can take all their catch ashore rather than throwing fish overboard and furthermore curtails the fraudulent practice of landing fish under a false name. The disadvantages are mainly that the system may not be efficient in protecting specific species. Also, there is a need to take into account technological improvement over the years and reduce the number of days accordingly; this tends to be difficult to achieve due to heavy resistance from the industry and the political system.

Although there has been significant restructuring within the fishing industry, there still is an over capacity of vessels. Other means, such as limiting the number of fishing days and encouraging fishing of other species are being used to diversify and, hence, reduce the capacity indirectly. Restrictions are also enforced by limiting and banning fishing in specific areas for longer or shorter periods. This is especially useful for the protection of spawning and young fish.

Aquaculture

The fish farming industry is a relatively new industry in the Faroe Islands. It started in the early 1980s and has since emerged into the second most important contributor to the Faroese economy. Production has been volatile over the years. In 2002, the production was around 45 000 tonnes and the export value DKK 943 million, which corresponds to 23% of total export. The production was just below the record year of 2001, but prices have remained low and hence the value was about the same.

In the early 1990s, the industry was in distress and the number of licenses went from 60 to about 15 through a series of mergers and acquisitions. Vertical integration took place such that companies now, wholly or partly, own the production from smolt to processing factory. This also allowed for larger permits and a foundation for better planning in production, less strain on the environment and a better financial result. The boom in the industry has also attracted foreign investments, but foreign ownership has hitherto been restricted by law to 33% of equity. This may now change as the political system is now reviewing the rules of ownership in this sector.

The fish farming industry conducts research to improve the quality and efficiency of production. There is also ongoing research in the farming of other species of fish, mainly cod and halibut, but so far this has not proven to be commercially viable. The public owned company P/F "Fiskaaling" gets an annual support from the Faroe Government of 1.5 to 2 million USD mainly to carry out research to develop and improve aquaculture of fish and shellfish. Thereby the aquaculture industry gets an indirect economic support being able to use the research results and improvements developed by P/F "Fiskaaling", however, this is the only public economic support to the Faroese aquaculture industry. For the time being the Aquaculture industry experiences a crisis. Nevertheless, recently more than 20% of the value of exported fish products from the Faroe Islands came from the aquaculture industry.

The tourism industry

The Faroese tourist industry is the third largest export earning activity although its contribution to employment and regional economy is small. Increasing demand for holidays in remote areas and for niche tourism activities generally demonstrate that a potential exists if facilities are improved (Anon., 2001).

For many years, efforts have been made to develop the tourist industry in order to diversify the Faroese economy (Anon., 2003a). A few years ago, a goal of 50 000 tourists per year was set. In 2002 about 44 000 tourists visited the Faroe Islands. About 17 000 of these come to visit family and friends. The direct income effect of the tourism industry is estimated to be about DKK 150 million. Given the progress that has taken place to date and anticipated in the future, tourism will slowly become a more reliable source of income for people throughout the islands (Anon., 2003a).

Agriculture

Farming in the Faroe Islands is quite insignificant. Until the end of the 19th century, farming was the Faroe Islands' main industry, but with the economic and industrial development since then, particularly within

fisheries, farming today accounts for only about 1% of the Faroe Islands' gross national income at factor cost. With a view to increasing the self-sufficiency of the Faroe Islands, the government is providing grants for investments in farming.

Energy and oil expectations

The joint municipal company SEV is responsible for the production and sale of electricity on the Faroe Islands. In 2001, production amounted to about 230 million kWh. Of this, more than 30% was based on hydroelectricity, while the remainder was produced at diesel-driven plants. Recently a certain development is occurring in the field of wind generated power production. Of the electricity sold in 2001, 33% went to domestic users, 35% to industry, agriculture, and fisheries, 14% to the service sector, and the remainder to street lighting etc.

Since a number of oil finds in British territorial waters close to the Faroese border in the 1990s, there has been a reasonable presumption that there is oil in the Faroese offshore territory, and the first licensing round was held in the spring of 2000 (Anon., 2001). The first licences for exploration and production of hydrocarbons in the subsoil off the Faroe Islands were granted in August 2000.

The first three exploration wells were drilled in the summer and autumn of 2001. In one of these, oil was found. An evaluation programme is now being carried out to determine whether this find is commercially viable.

The possibility of developing an oil industry in Faroese waters has been steadily progressing since 1993. Uncertainty prevails about the type and scale of activity that will actually emerge if and when oil is found. This uncertainty breeds a variety of differing reactions, but overall there appears to be an expectation within the Islands that oil will be found, and found in sufficient quantity to exert a profound long-term impact upon Faroese society, the environment and the regional economy (Anon., 1997; 2001).

A comprehensive energy policy for the Faroe Islands, including how to increase the amount of energy produced from renewable resources such as wind and waves, is under way being formulated by a committee established by the Faroese Prime Minister. For example there has been established formal cooperation with bodies in Scotland (waves) and Iceland (hydrogen).

Transport and communications

The geography of the island group and the topography of the individual islands makes it an expensive challenge to provide good

and appropriate transport and communication services. In the past access between settlements frequently involved either travel by boat or traversing precipitous mountain and cliff paths.

In recent decades the islands have developed a modern and integrated transport infrastructure. The islands have approximately 450 kilometres of paved highway. The majority of settlements are directly linked to the road network, and a number of extensive road tunnels have been constructed. The three largest islands, Vágur, Streymoy and Eysturoy, are linked by a bridge and a sub-sea tunnel. Another sub-sea tunnel is currently under construction to link the islands of Eysturoy and Borðoy. Responsibility for road maintenance is divided between the municipalities and the Faroese Ministry of Trade and Industry, the latter having charge of maintaining the arterial routes.

Some of the more remote villages and inhabited islands are provided with helicopter services for both passengers and light cargo. There are 12 helipads situated in different parts of the islands.

Many of the Islands' municipalities operate small ports for inter and intra island passenger and cargo services, and larger ports are situated at Tórshavn, Klaksvík, Tvøroyri, Runavík and Fuglafjørður. Scheduled ferry services transport passengers and cargo between settlements along the shoreline and between the islands, and 'ro-ro' ferries operate on the major inter-island routes. Chilled and frozen cargo services operate across most parts of the archipelago.

There are regular, year-round sea transport links with a variety of European ports, mainly in Denmark, United Kingdom and the Netherlands, and the Faroese Islands are used as a transit port for goods and passengers travelling to and from Iceland.

The islands have one airport situated on the island of Vágur. The airfield is managed by the Civil Aviation Administration of the Danish Ministry of Transport. The majority of international passenger arrivals on the Faroese Islands travel by air, and Vágur Airport handles approximately 4 000 incoming flights annually, the majority originating from Denmark, but scheduled services also operate from Reykjavik, Oslo, Aberdeen and London Stansted.

Constructing roads, tunnels, and harbours is costly because of the difficult topographical conditions. Since an economic downturn at the beginning of the 1990s, the number of motor vehicles has increased by almost 1 000 and now stands at 21 000 motor vehicles, of which 16 000 are cars and 3 500 lorries and vans.

Conclusion

The Faroese economy is almost totally dependent of the sea and the production in the sea. This fact, naturally, has created a great interest in the variability in the surrounding sea, and how for example climate couple to variability in the productivity of marine resources and socio-economy.

As has been the case in the past, and is evident in many other small island economies, the demographics of the Faroese Islands are subject to significant migratory flows. The most recent economic crisis led to a period of sustained net emigration from 1989 to 1995. That position has reversed and the rate of net immigration is accelerating markedly. Between 1995 and 1999 the total population increased by 2019 persons (4.7%), approximately half of this increase being accounted for by net immigration.