The Birth of Fisheries Management

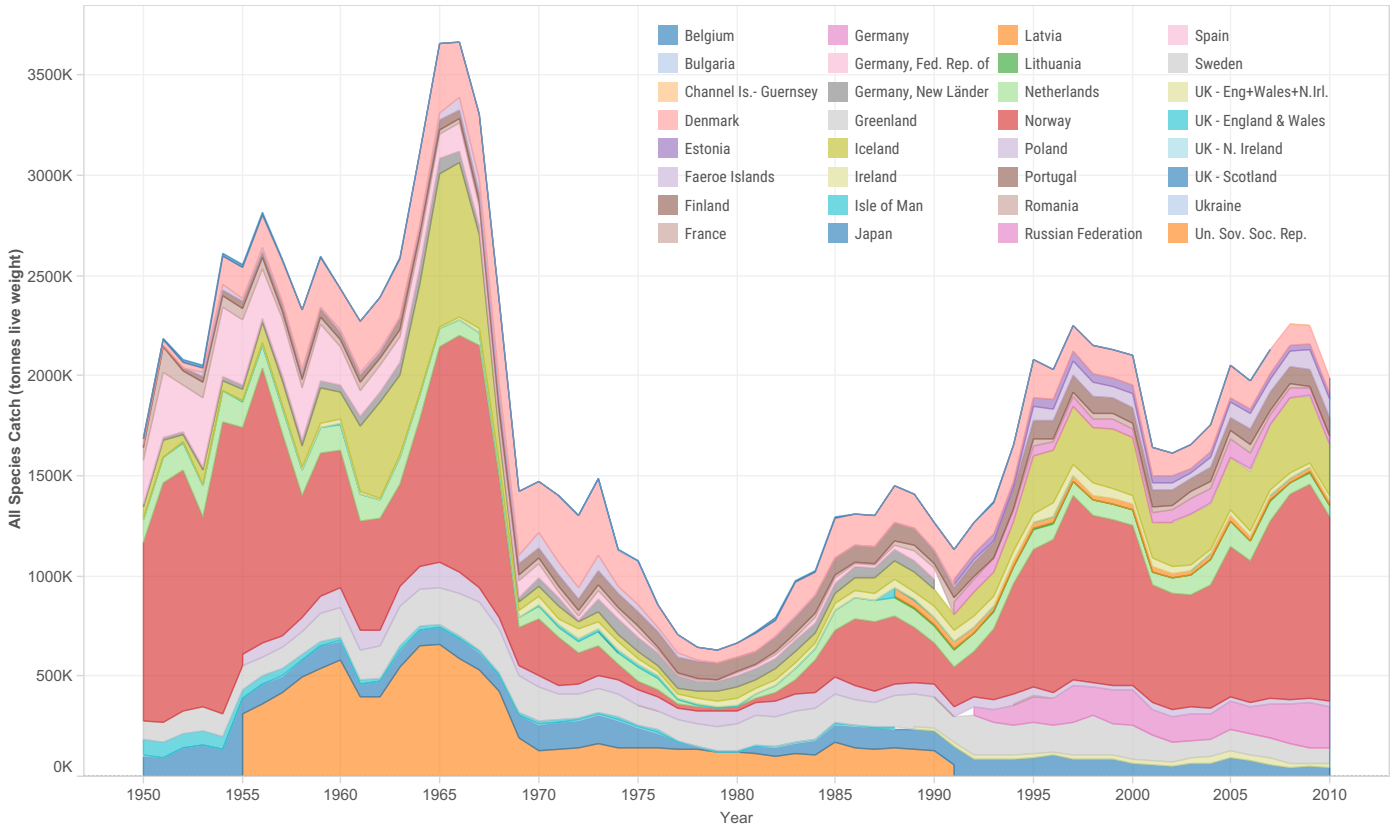
ICES has been recording fisheries statistics since 1904	New technologies lead to increased fishing pressure and catches	Under greater fishing pressure, North Sea herring stocks suffer	Political changes and the first voluntary regulations fail	The Cod Wars lead to the decline of the UK cod fishery

The International Council for the Exploration of the Sea

The dataset used in this visualization was published by The International Council for the Exploration of the Sea (ICES) · Conseil International pour l'Exploration de la Mer (CIEM), the world's oldest intergovernmental science organization. Established in Copenhagen, Denmark in 1902, they have been headquartered there ever since.

Denmark, Finland, Germany, the Netherlands, Norway, Sweden, Russia, and the United Kingdom were the first eight member nations. Belgium, Canada, Estonia, France, Iceland, Ireland, Latvia, Lithuania, Poland, Spain, and the United States have since joined.

This particular dataset covers the nominal catches for 1950-2010 for as many countries as ICES could find data.



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New Technology

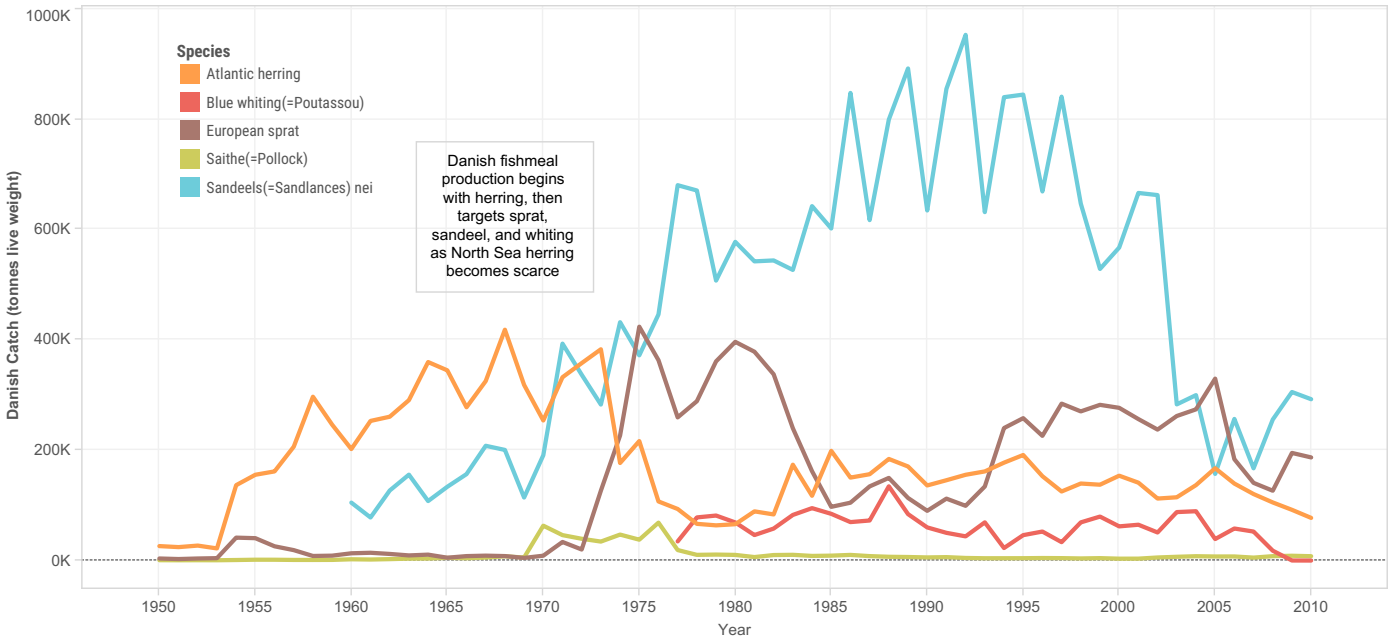
1950-2010 was a particularly interesting time for fishing in the North Atlantic due to technological advances. In the early 1950s, the first 'super trawler' was built, able to pull much larger loads (up to 60 tons) over its stern. Radio navigation, fish finding sonar, and radar also came into regular use.

Available since 1944, radio navigation allowed fishers to reach fruitful fishing grounds quickly and easily, though it only worked within 750 km of shore. In 1957, the first commercial echo sounders were developed. New materials such as plastics, synthetic rubber and lines also contributed to increases in fishing power.

Economic changes also affected fishers. Following the War, the German market collapsed. The Danish fishery survived the war with considerable wealth, and vessels that had defected to Britain quickly returned. However, Danish fishers returning from re-opened fishing grounds with plentiful catches found few buyers.

Lacking demand for fresh fish, most Danish skippers decided to invest in fishmeal production technology. Prior to the War, fishmeal production had primarily been used to dispose of unsold, decaying fish. This marked a major change in business strategy for a fishery that previously prided itself on using less efficient gear to catch higher quality fish.

While fishmeal (used mostly as animal fodder) sold for far less than fresh fish, Danish skippers were now able to haul and sell as much fish as they could land. Known as the reduction fishery, it was sustained by extremely high catches through the 1950s and 1960s. The fishery first targeted herring, then sprat, sandeel, and whiting. Concerns over the reduction fishery's ecological impact led to international fisheries negotiations that did not prevent the overfishing of whiting in the late 1950s and the collapse of herring stocks in the 1970s.



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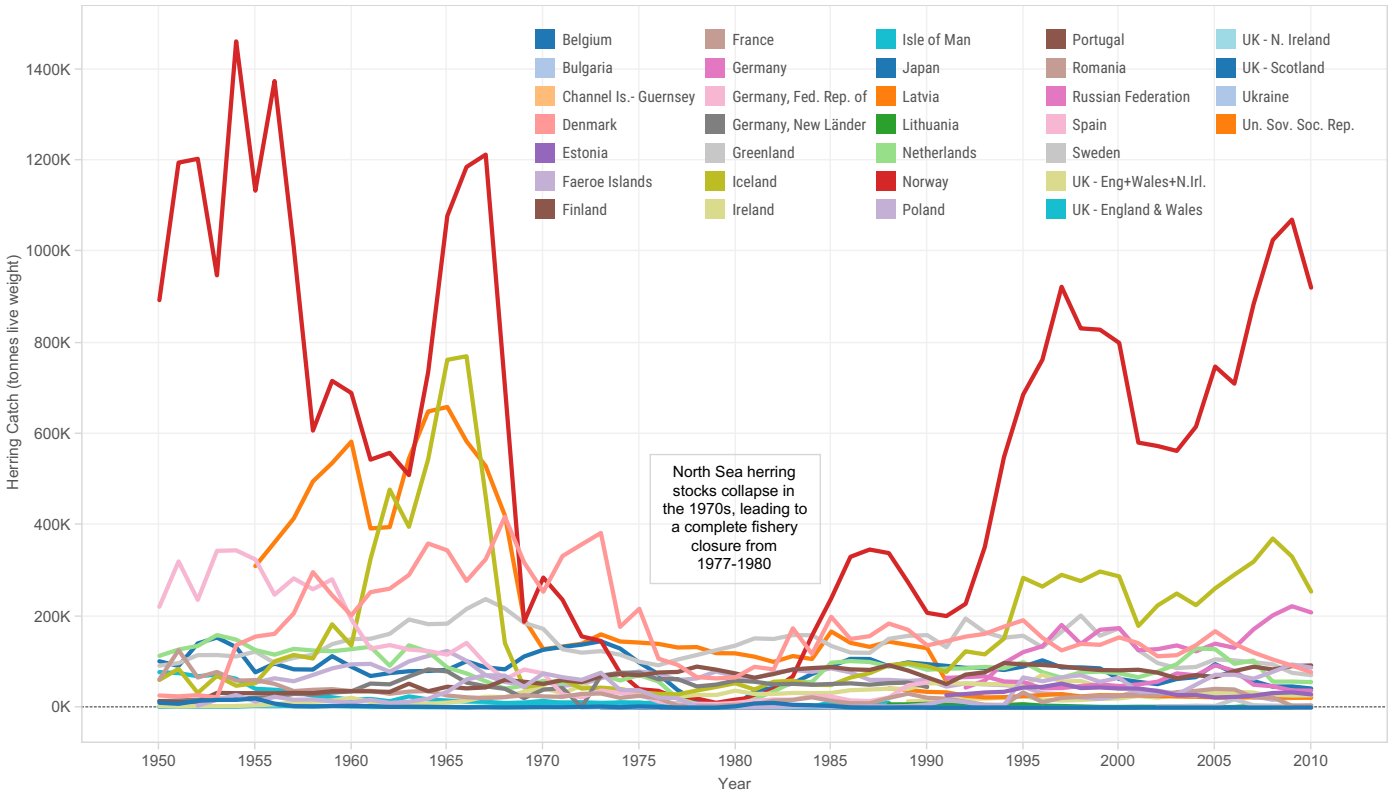
Decline of the Herring

Herring is an oily fish caught by ICES members in the North Atlantic and North Sea. They readily aggreate in shoals containing hundreds of thousands of fish. Schools can occupy as much as 4 cubic kilometers of water.

Herring can live up to 12 years, and reach 40 cm in length and almost 700g in weight. They reach sexually maturity at 3 or 4 years old (~25 cm in length). The length and weight of herring depends on the stock it belongs to, with Baltic herring having a smaller size at sexual maturity.

Fishers use purse seines to capture higher quality herring. Pelagic trawlers can haul in larger quantities at the cost of quality, as the trawling process is associated with rougher handling.
The North Sea herring stock suffered a major collapse in the early 1970s, due to overfishing, which led to the fishery being completely closed from 1977 to 1980. A further decline in the

1990s led to recovery measures being implemented which some consider to be successful.



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Political Changes Fail to Prevent Herring Collapse

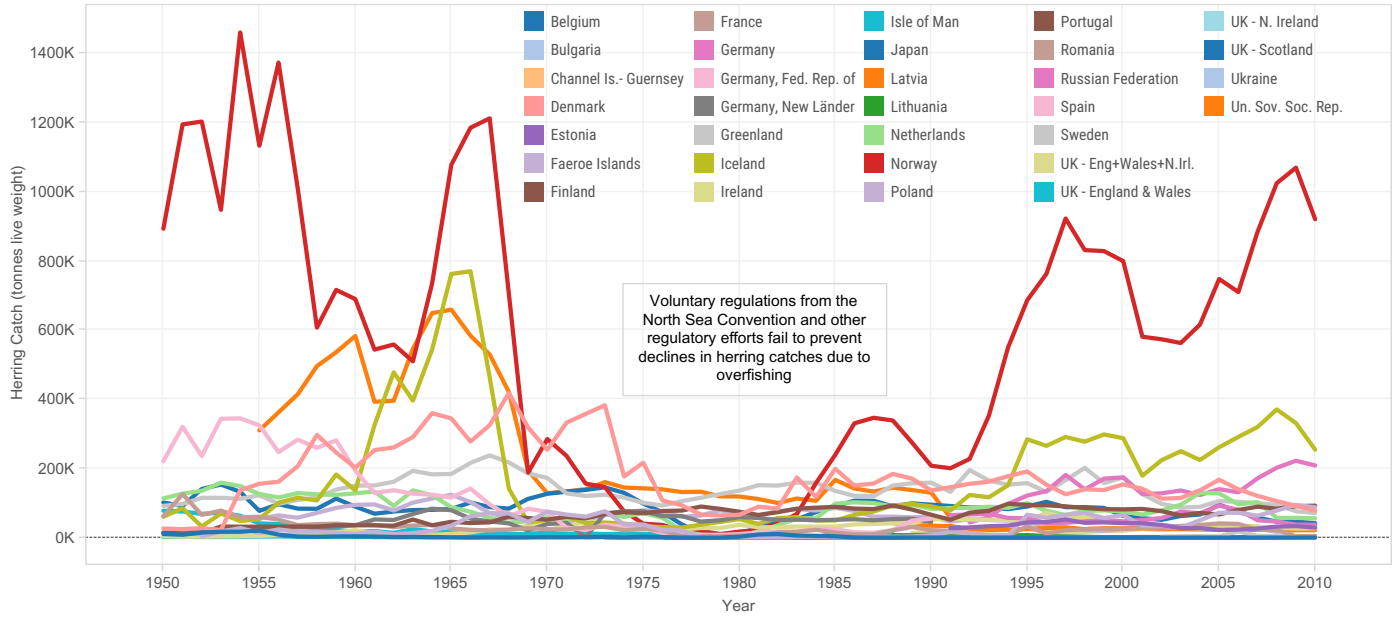
The 1950s marked the end of ineffective fisheries management practices implemented slowly since the century began. ICES was was founded in 1903 in response to overfishing in open waters. It was a significant step in starting a dialogue, but failed to reduce overfishing. Encouraged by greater catches of larger fish from areas previously off-limits during WWI, the 1925 International Conference of the North Sea Plaice Fisheries optimistically recommended a moratorium on fishing in parts of the North Sea. However, fishers did not agree to halt fishing in these zones.

In 1946, the North Sea Convention agreed on measures such as minimum fish and net mesh size, based on 1930s-era recommendations by biologists. Developed before the advent of the previously described changes in fishing gear and practices, they proved insufficient. Furthermore, enforcement of the Convention did not occur until 1954, and even then all countries had agreed to an opt-out clause--meaning any country could disregard the regulations.

In 1945, US President Harry Truman introduced one of the most impactful political concepts on fisheries by claiming wider rights over economic interests on the North American continental shelf. This was in part a response to the potential resumption of Japanese salmon fisheries off the Alaskan coast. Other countries swiftly followed suit, claiming exclusive fishing zones along their coastlines against other nations' fisheries.

These political changes led to the first International Conference on the Law of the Sea held in 1948 to establish a new consensus on maritime law. The conference extended territorial limits to 12 nautical miles offshore, but did not come to a longstanding agreement. Another ineffective conference was held in 1960.

In the 1960s and 1970s, countries dramatically changed their positions. As catch rates plummeted, more countries accepted that fish stocks were limited in abundance and full depletion was possible. The 3 year closure of the herring fishery was a result of this change in position.



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The Cod Wars

Disagreements between the United Kingdom, West Germany, and Iceland over fishing rights off the shores of Iceland led to a series of confrontations known as the 'Cod Wars'. These ultimately resulted in the decline of the UK cod fishery.

Following the International Law of the Sea conferences, Iceland passed national law expanding its exclusive fishing zones from 4 to 12 nautical miles offshore. Their post-war economy was almost exclusively dependent on fishing income, and Iceland immediately began confronting British fishers with armed Coast Guard patrols. In response, the British declared their trawlers would fish inside these zones..

In 1958, the first set of confrontations escalated to the point where Britain spent 500,000 pounds sterling worth of oil and deployed a total of 37 Royal Navy ships to counter Iceland's seven patrol vessels and single flying boat. Shots were fired and one collision occurred. They ended in a settlement requiring any future disagreements to be brought to the International Court of Justice in the Hague.

The Second Cod War, from 1972-1973, began in response to Iceland's expansion of their exclusive fishing zones to 50 nm. Icelandic Coast Guard vessels began cutting the nets of foreign fishing vessels, and the Royal Navy sent 30 frigates and 1 destroyer to escort British fishers. A collision resulted in the death of one engineer, who was performing welding repairs on the ship's hull as it was rammed; the compartment filled with seawater and he was electrocuted. It ended when the UK accepted Iceland's annexation and Iceland granted the UK permission to catch 150,000 tons of fish until 1975.

The Third Cod War, from 1975-1976, again occurred following another expansion of the exclusive fishing zone to 200 nmi off Icelandic shores. Iceland again began cutting fishing nets off foreign trawlers. Several ramming incidents occurred and one shot was fired. Iceland ended the confrontations by threatening to close a hosted NATO base; this would have impaired the British government's ability to fulfill their primary NATO responsibility of protecting the Greenland-Iceland-UK gap.