

21. Figures

Figure 8.

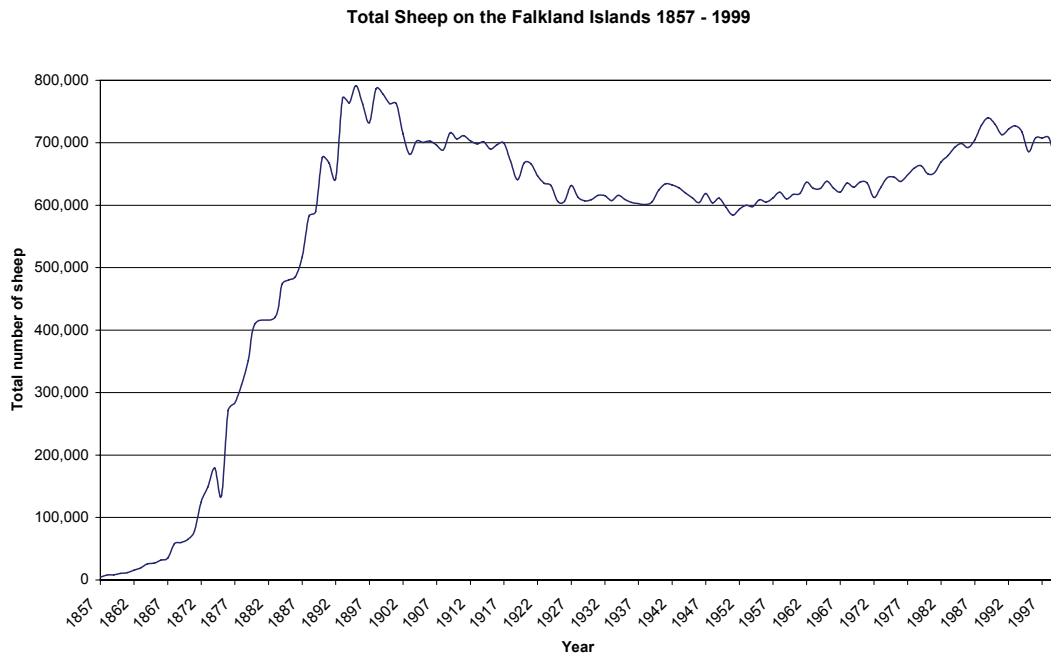


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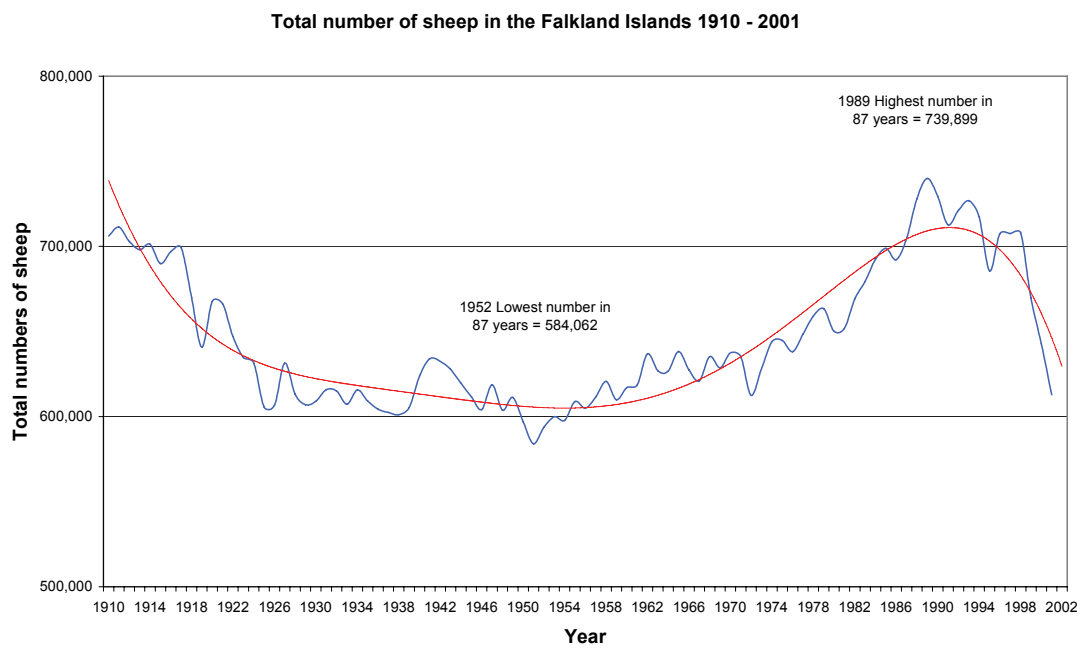


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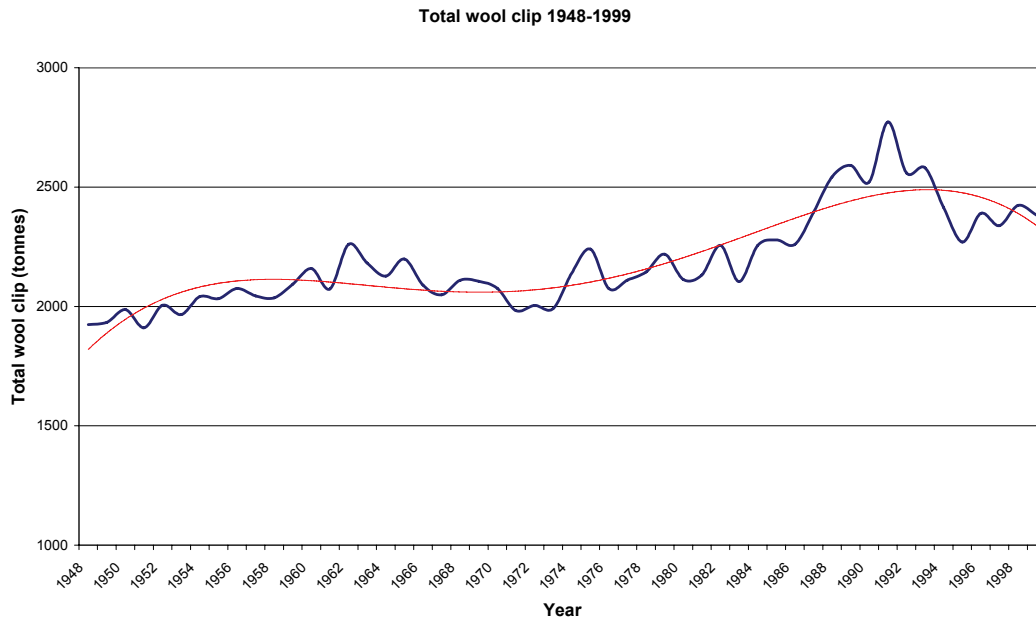


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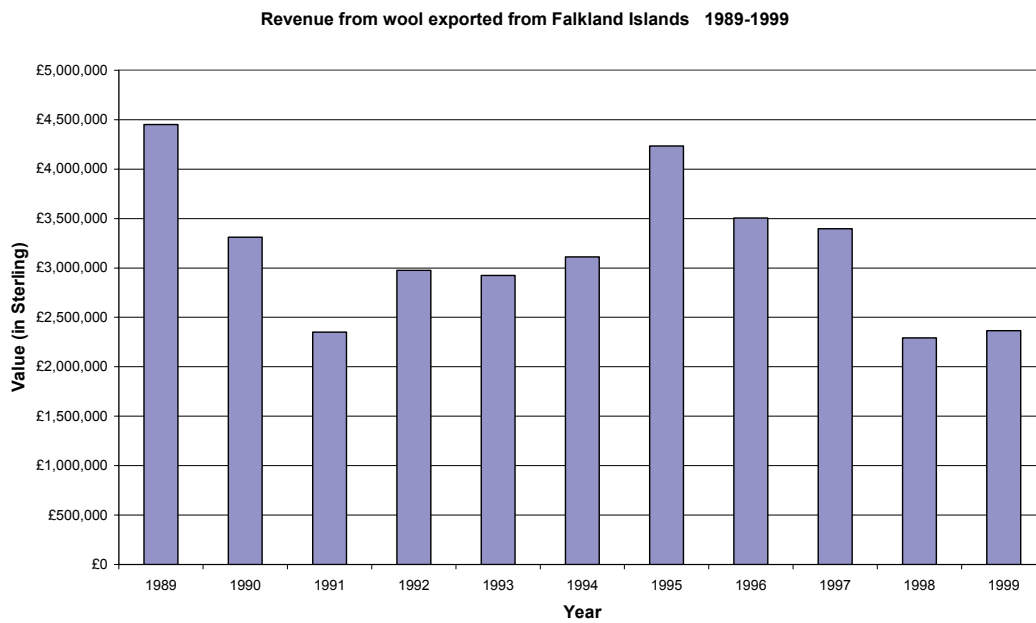


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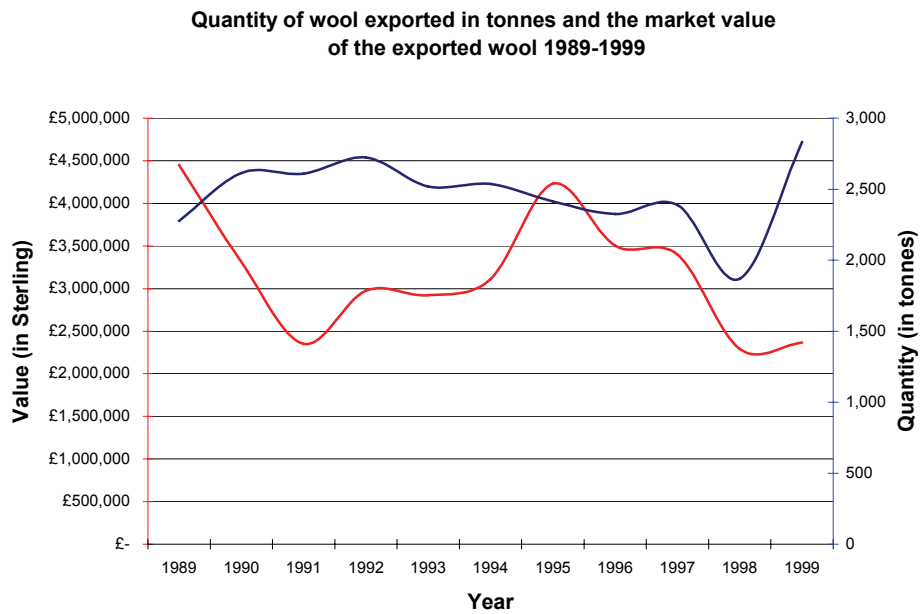


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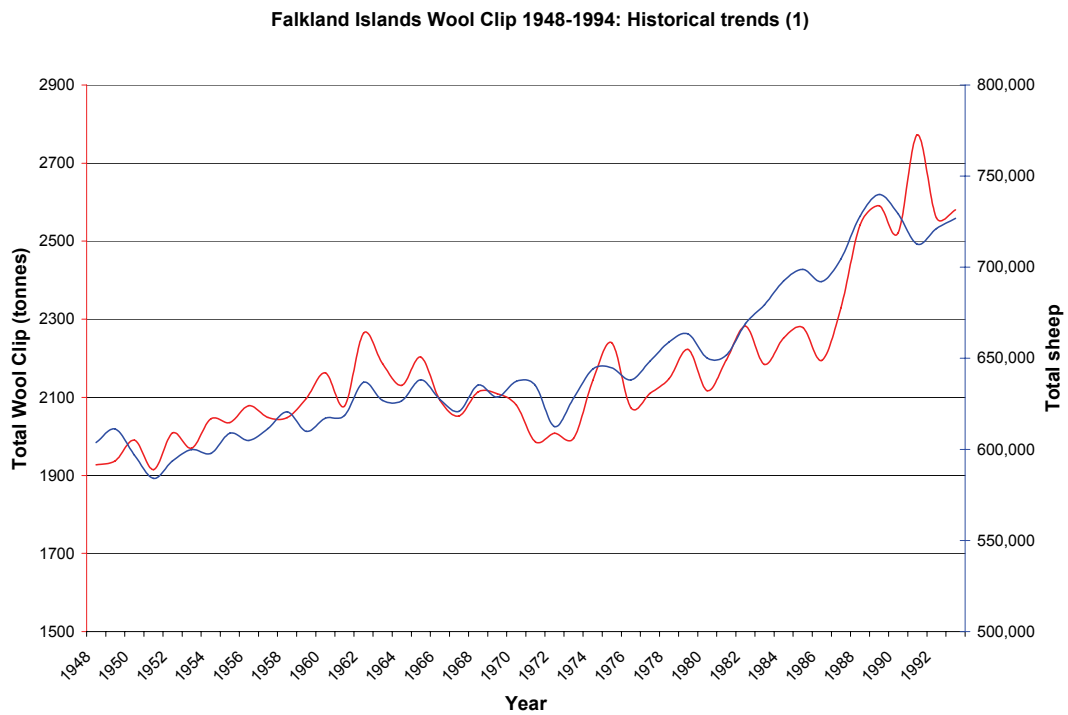


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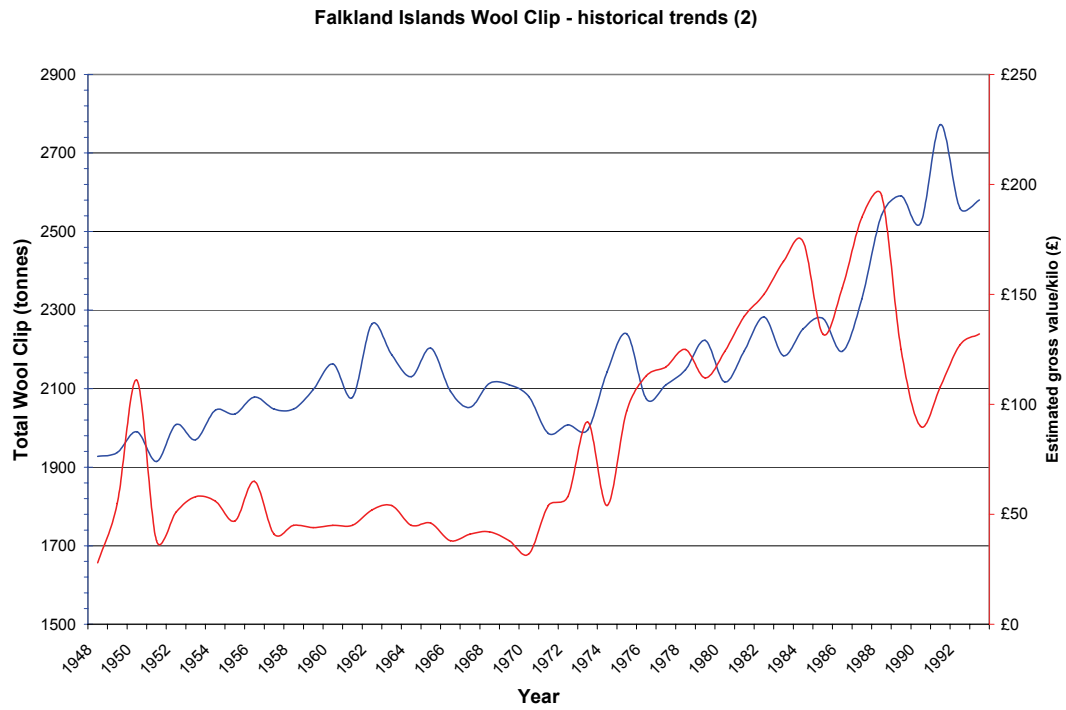


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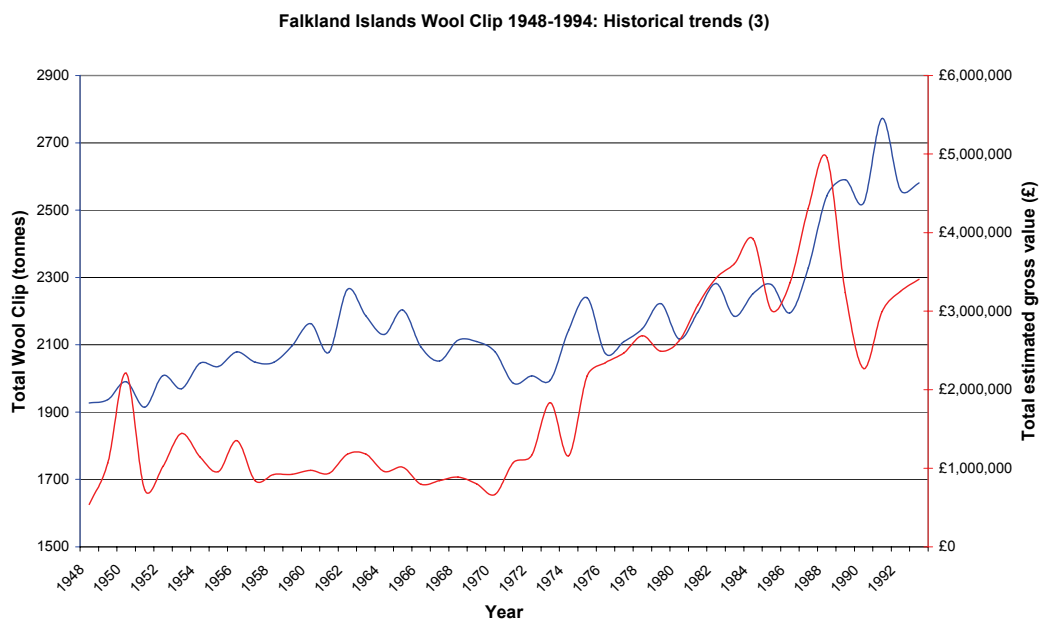


Figure 16.

Sealing Expeditions in the Southern Oceans 1786-1921

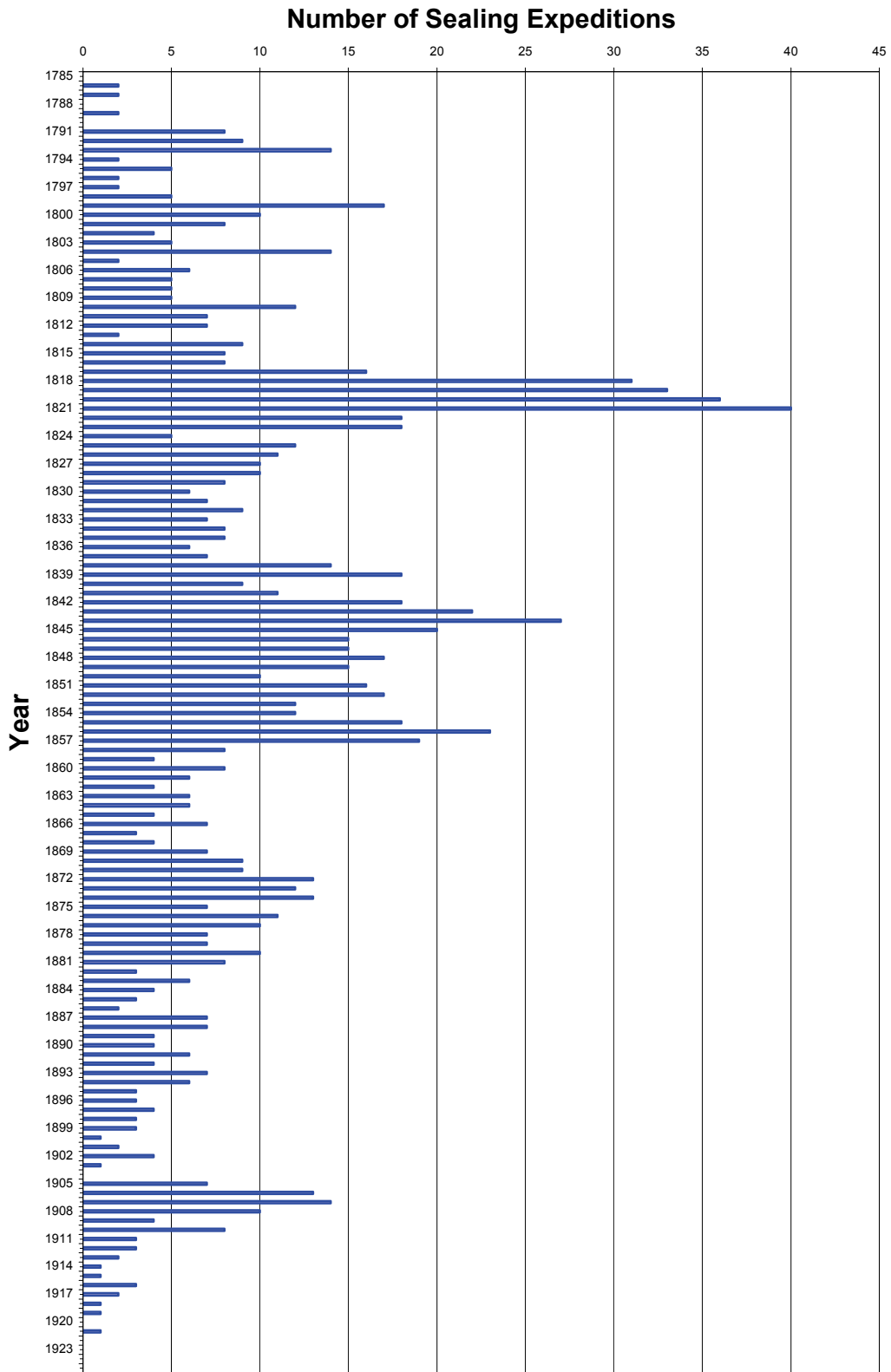


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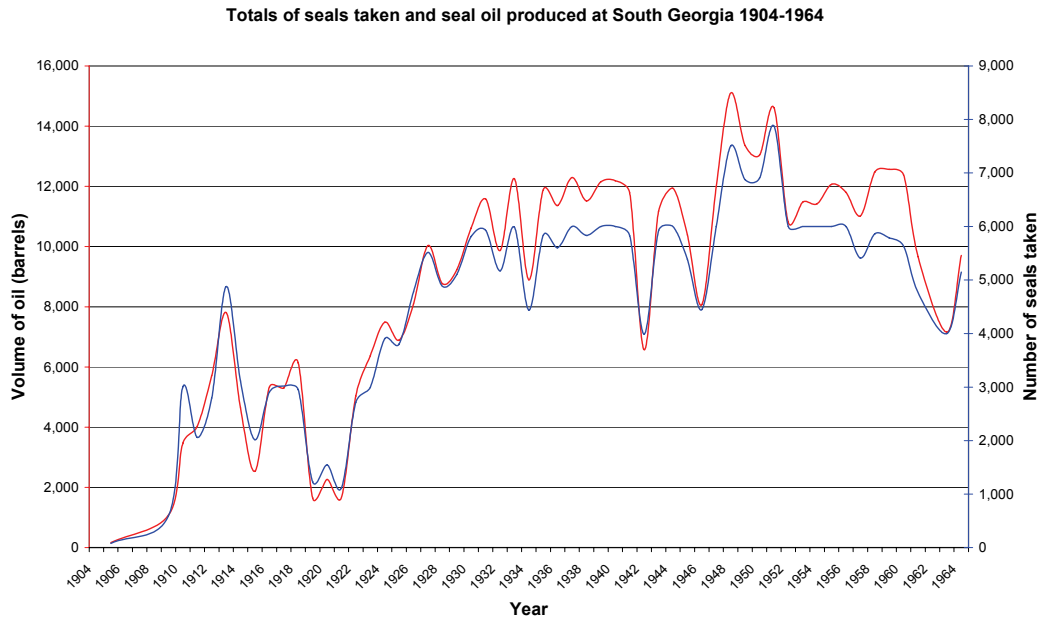


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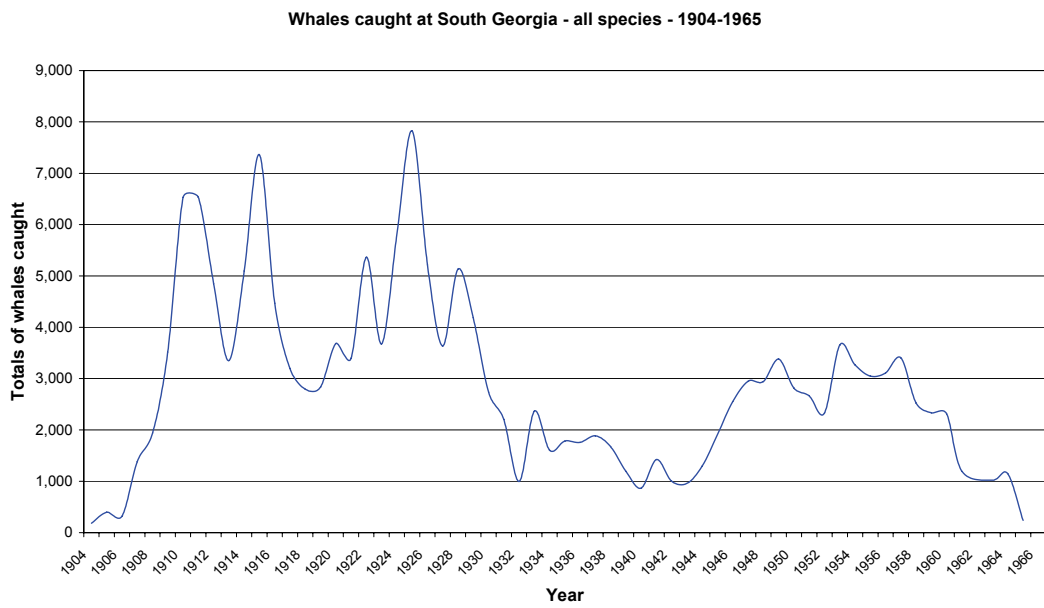


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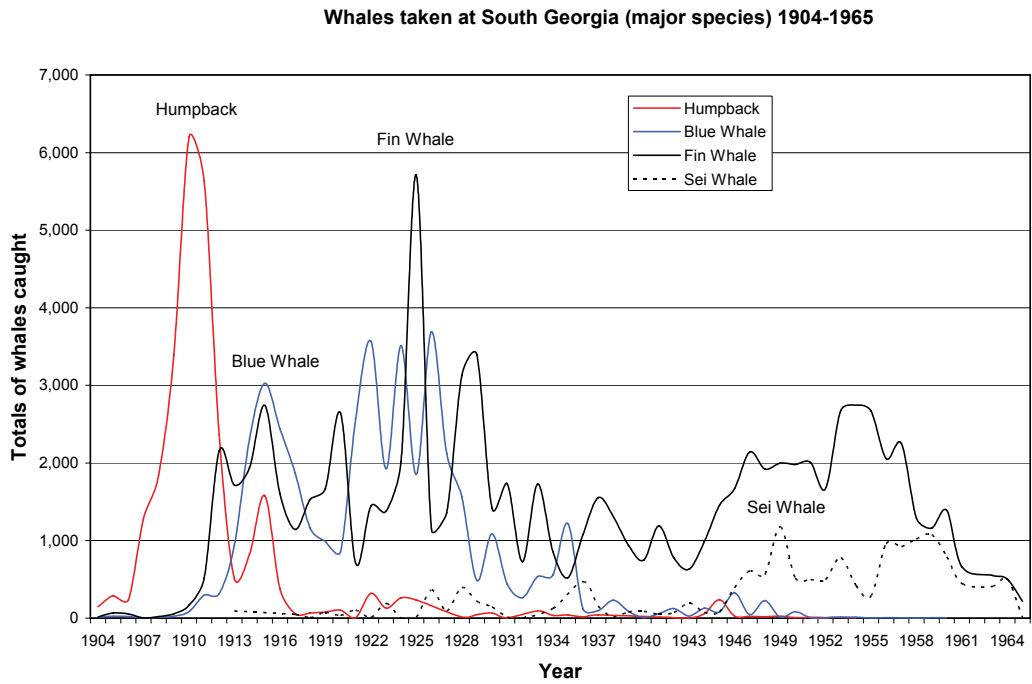


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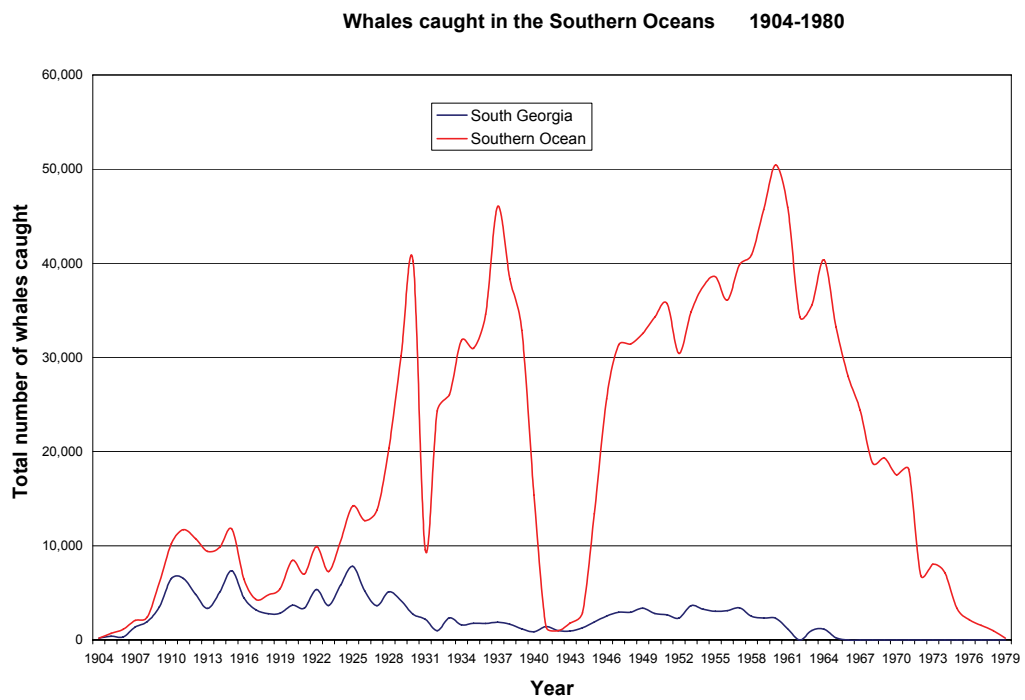


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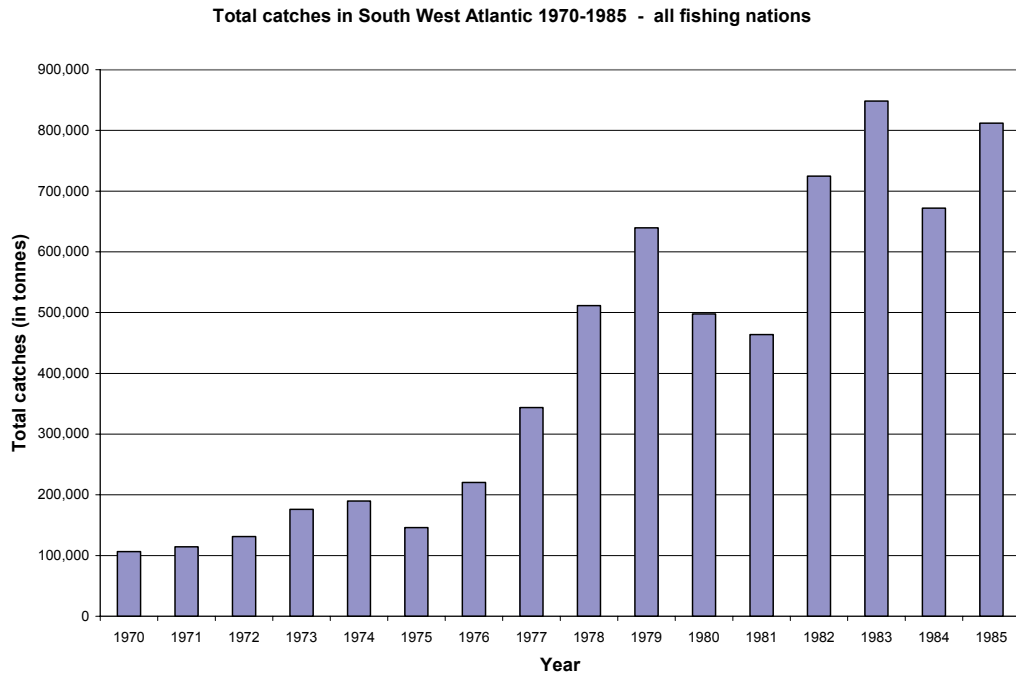


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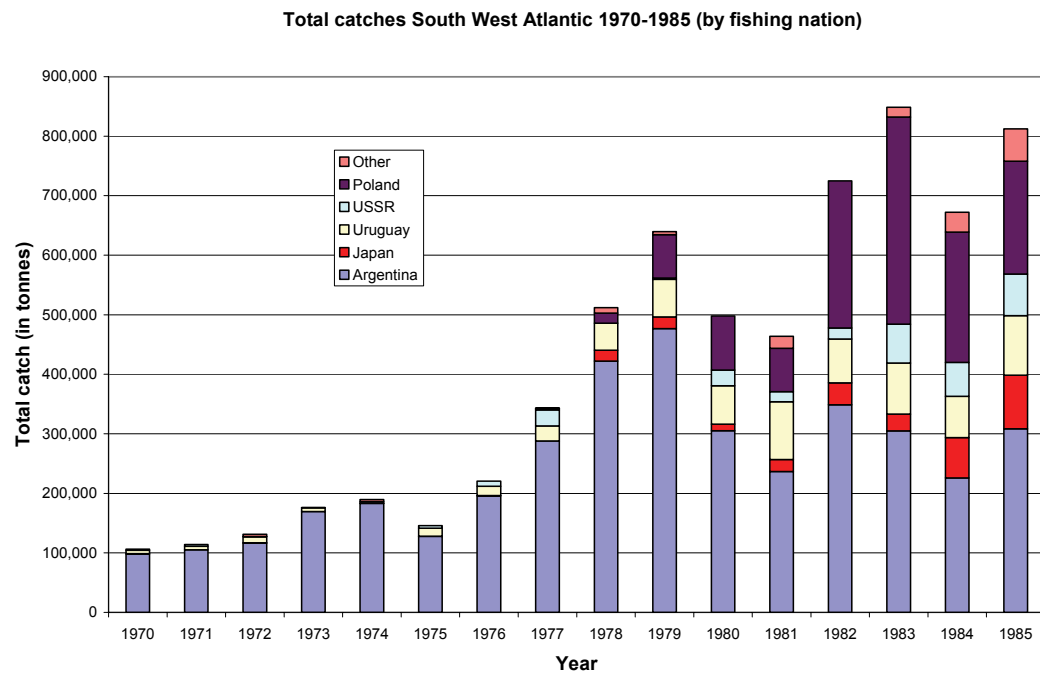


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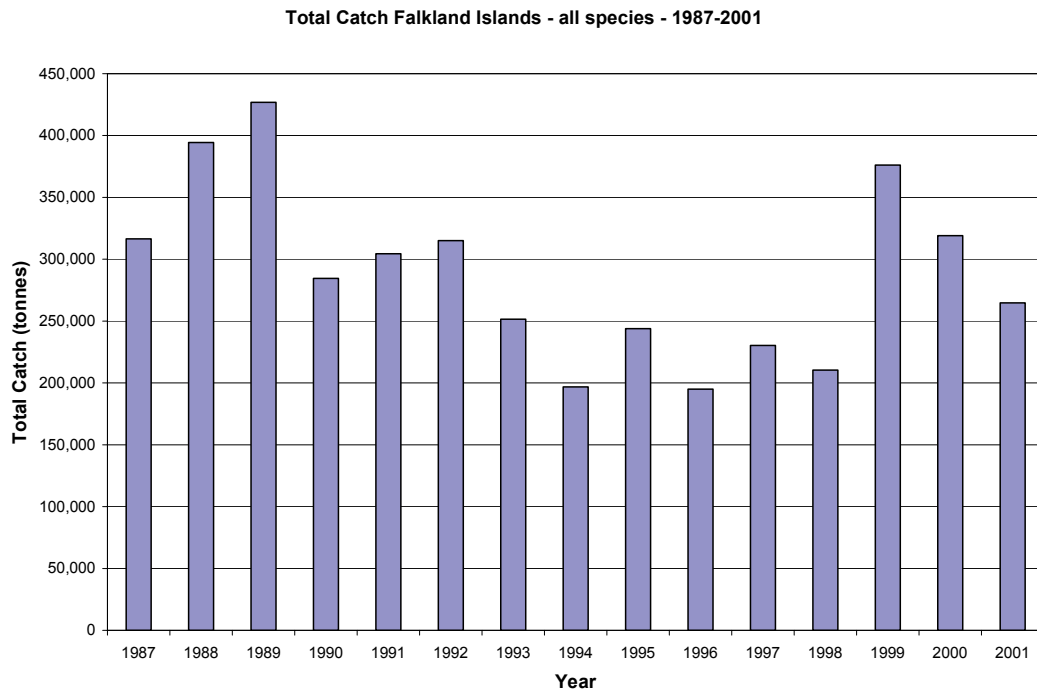


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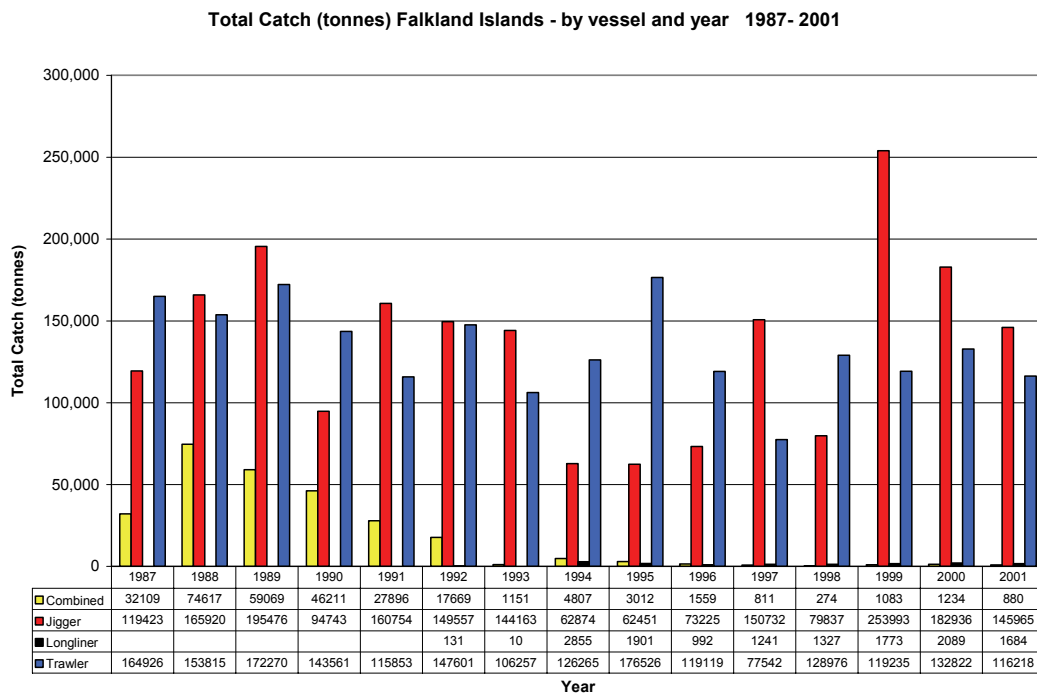


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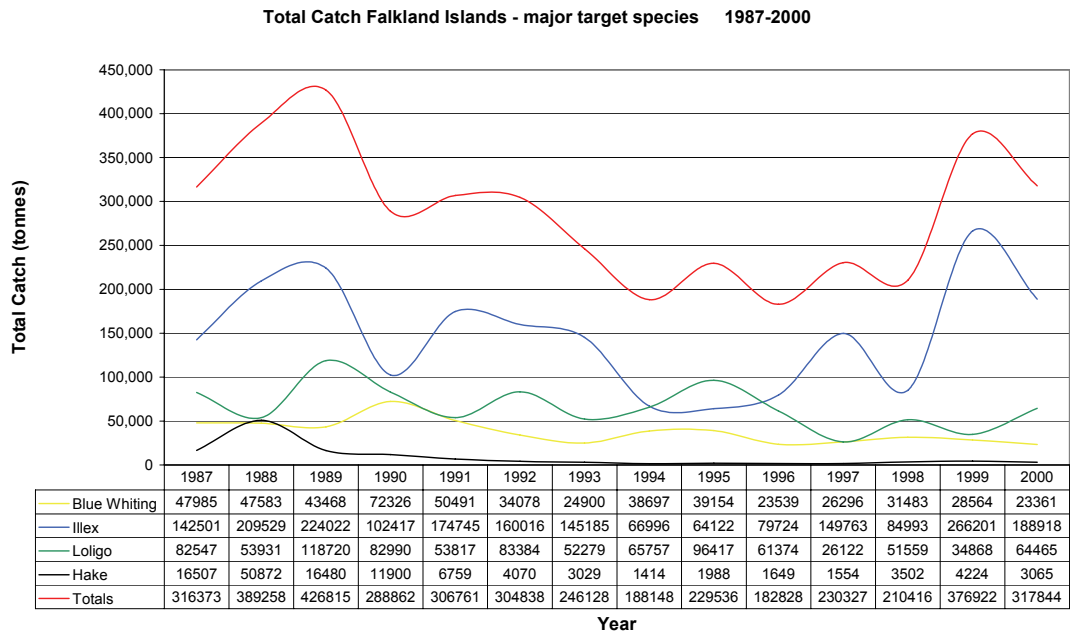


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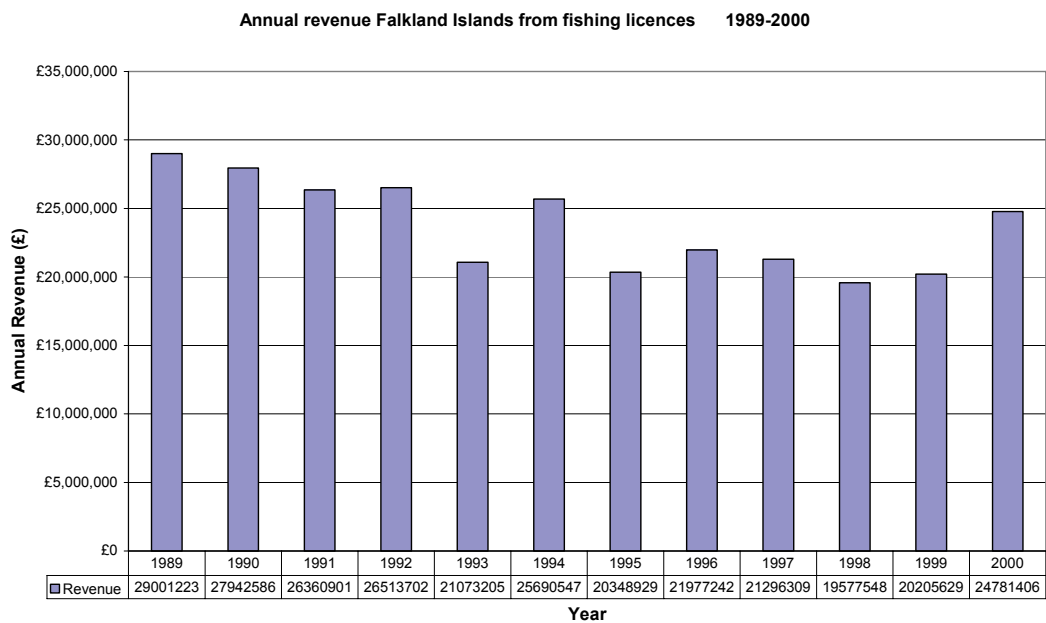


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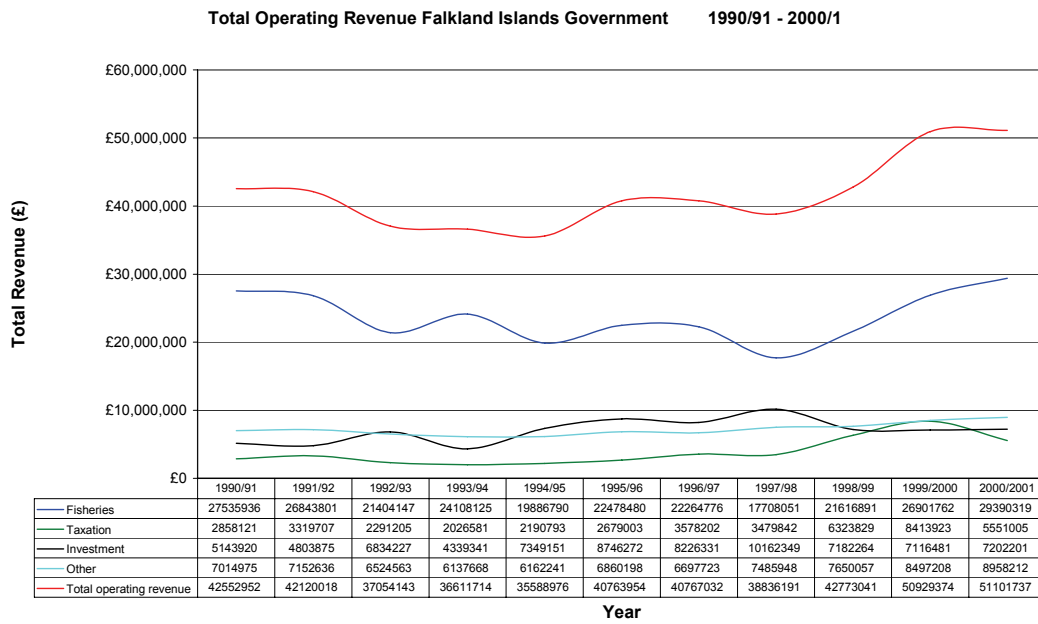


Figure 28.

Total Operating Revenue Falkland Islands Government 2000/2001

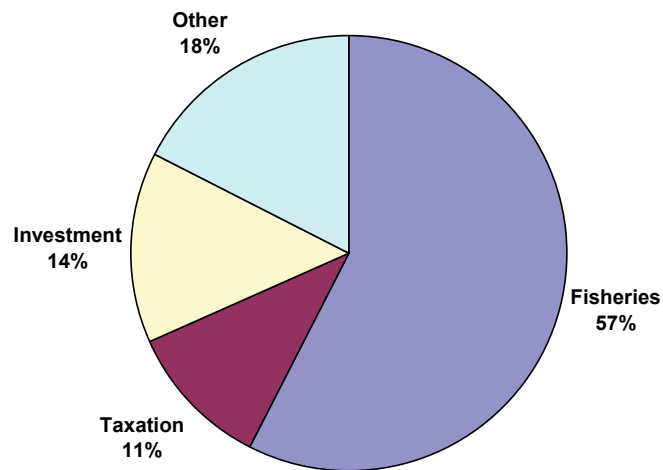


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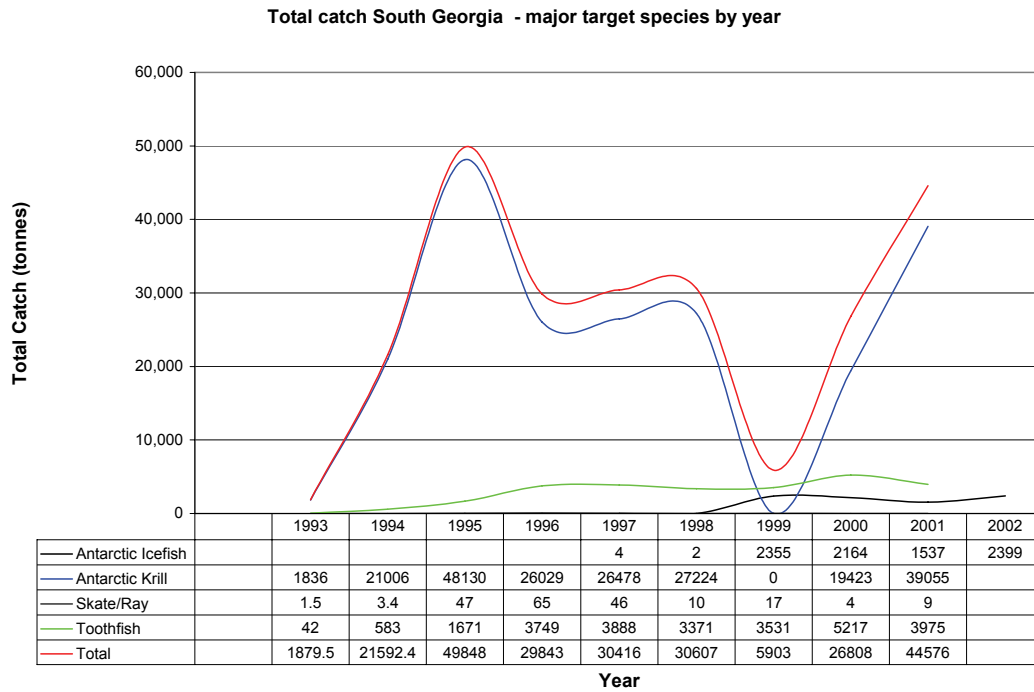
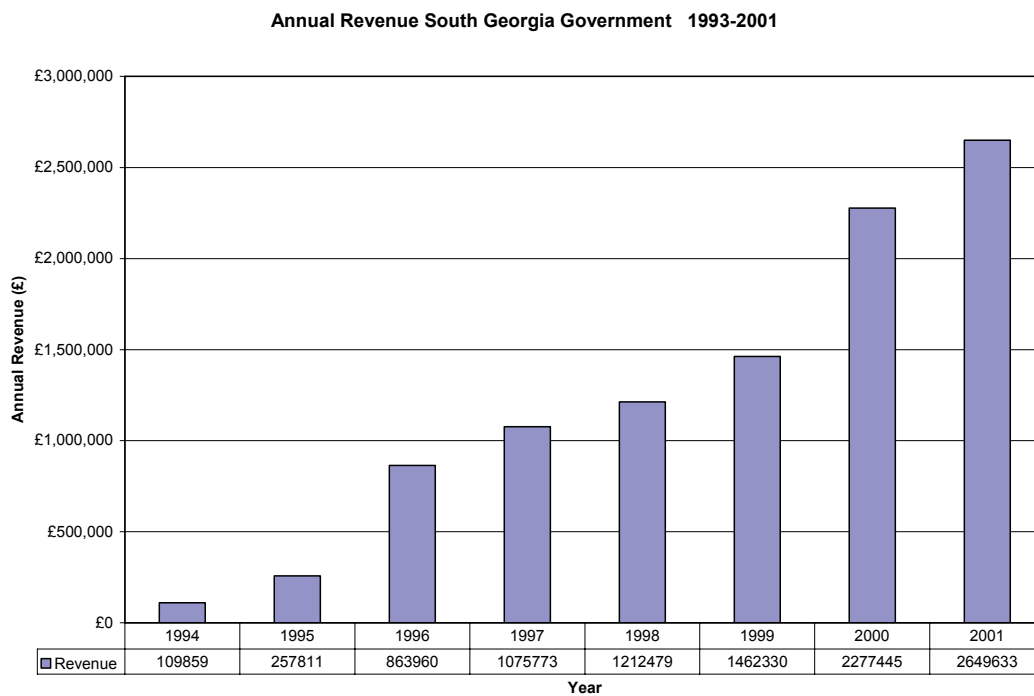


Figure 30:



Explanatory notes for Figures 1-30

Figure 1:

Note that the Islands are north of the Antarctic Convergence and that South Georgia is south of the Convergence. The Convergence has a considerable effect on the climate of the region. South Georgia is classified as a peri-Antarctic island and has permanent ice above 200m, whereas the Islands are cool and temperate.

Figure 2:

Note that Beauchêne Island is not indicated on this map; it is located 110km. South of the southern-most point of East Falkland Island. It is a National Nature Reserve; it is now one of only a few islands in the Falklands group that are in a relatively pristine condition.

Figure 3:

Note that all the whaling stations are located on the northern side of South Georgia (*i.e.* on the lee side from the prevailing winds). Suitable land for shore stations is very limited; West and East Cumberland Bay contain some of the most suitable sites. Salvesen located their operations at Leith Harbour partly because Compañia Argentina de Pesca had already begun operations (in 1904) at Grytviken, and partly because they wished to keep their operation distinctively different from an Argentine company. Leith Harbour eventually became the world centre of whaling, and the headquarters of Salvesen's pelagic whaling fleet.

Possession Bay is where Captain James Cook landed on 17 January 1775 and took possession of the island in the name of King George III.

Figure 4:

The EEZ and FICZ/FIO CZ zones are for the most part a continuation of the Exclusion Zones imposed during the 1982 Conflict.

Figure 5:

Illex squid is a straddling stock; *i.e.* it is shared between the Islands FICZ and the Exclusive Economic Zone of Argentina. Illex squid spawns in Argentine waters; it migrates south into Islands waters - to feed - as maturing squid.

Southern Blue Whiting stocks are straddling stocks, and were heavily over-fished by the Argentine fishing fleet in the 1980s.

Loligo squid are found exclusively in Islands waters; current (2004) evidence suggests that the squid spawns inshore in the coves and bays of East Falkland Island; after hatching the young squid migrate eastwards into deeper waters to feed and mature.

Figure 6:

Although the Maritime Zone includes both South Georgia and the South Sandwich Islands, fishery patrols are only conducted around South Georgia because of the location of the fish and fishing fleets.

Figure 7:

This figure show the various descriptive terms used in this dissertation.

Figure 8:

Note the very rapid build-up of sheep stocks between 1877 and 1897; the gradual decline in sheep numbers after 1900, the gradual increase after World War II and the decline again since 1990.

Figure 9:

At the point that sheep numbers were at their lowest level for many years (in 1952) this also coincided with the period of the Korean War when wool prices rose to unprecedented heights.

After the large farms were broken up (from the late 1970s onwards) sheep numbers initially increased. This was the result of retaining older sheep that would otherwise have been culled. Total wool production also increased during the same period, but the quality of wool, *i.e.* fineness, declined overall.

Since mid-1990s sheep farming has again been in decline.

Figure 10:

The total wool clip steadily increased after World War II because of the increase in sheep numbers, and because of some improvements in sheep farming methods.

The wool produced by the Islands is less than 0.4% of the world total wool clip.

Figure 11:

Income from the sheep industry has been in decline since the 1960s; the income derived from the fishing industry during the period 1989-1999 is approximately ten times that derived from the sheep industry.

Figure 12:

During 1989-1999 total wool clip increased considerably, but that during the same period the income for the wool fell from £4.5M to £2.4M.

Figures 13, 14 and 15:

Note that after the dramatic rise in income derived from wool during the Korean War period, income has not increased relative to inflation, and that there has been an overall marked decrease in farm income after 1988.

Figure 16:

Note that within five years of Captain James Cook reporting the sighting of vast numbers of seals on the islands of the Southern Ocean, sealing operations began in earnest. The Islands and South Georgia were exploited first; expeditions returned to South Georgia every ten years until by 1900 the Fur Seal was regarded as extinct on the island.

South Shetland was exploited in the years following 1816; stocks were rapidly exhausted. The pattern became quickly established that the sealers cleared out one group of islands and then moved on to another group of islands until all the stocks were significantly depleted.

Note that 'Expeditions' could consist of a number of ships *i.e.* as many as ten ships per Expedition.

Figure 17:

The elephant seal oil industry on South Georgia was undertaken by Compañia Argentina De Pesca as an additional activity to whaling. The island was divided into four divisions by John Innes Wilson in 1910, which enabled it to be carried out in a sustainable manner. Dr Richard Laws encouraged the government to rescind the decision to increase (made in 1948) the total number of Elephant Seals taken from 6,000 p.a. to

9,000 p.a. The limit of 6,000 was reinstated and this was maintained until whaling ceased on South Georgia. The end of the Elephant Seal oil industry coincided with the end of whaling at Grytviken.

Figure 18:

Land-based whaling on South Georgia was begun by Compañía Argentina De Pesca in 1904; the total number of whales taken during the next sixty years was only 10% of the total number caught in the Southern Ocean. Pelagic whaling began in the late 1920s, and it soon became the principal part of the industry.

Figure 19:

Land-based whaling began with hunting Humpback Whales, followed by Blue Whales; the Fin Whales became the mainstay of the industry from 1930s onwards. (Humpback Whales almost completely disappeared and Blue Whales became very scarce). Sei Whales - which hitherto had been ignored as being too small - were hunted in the period at the end of the industry.

Pelagic whaling followed a similar pattern of species exploitation.

Figure 20:

The massive increase followed by a dramatic decline in whales caught in the period directly after the introduction of pelagic whaling in 1928. There was substantial overproduction; the world price of oil crashed, and many ships were laid up. A number of land-based whaling stations (including those on Deception Island) closed. Fewer, but much more efficient, companies subsequently increased their operations following the recovery in the price paid for high grade whale oil.

Pelagic whaling ceased during World War II.

After World War II many more countries began whaling operations and that

there was a huge increase in the numbers of whales taken. This ‘dash for the line’ was undertaken in full knowledge that such activity was unsustainable and that this occurred despite the gradual restrictions imposed by the International Whaling Commission. It was during this period that significant and long-term damage was done to whale stocks.

Not all the whales caught by USSR whaling ships after 1970 are included in these figures. Large numbers of whales (including the protected Blue Whale) were caught, and the account rendered to the International Whaling Commission was considerably falsified.

Figure 21:

These figures originate from F.A.O. and are the reported catch levels only. They only give an indication of the scale of the fishing effort in the South West Atlantic; it is likely that the actual tonnage of fish caught was considerably higher.

Figure 22:

The reported figures of Argentine fishing companies are probably approximately accurate. The Polish and Soviet Union reported catch levels are considerably lower than the actual catch.

Note the emergence of Japan as a major Southern Ocean deep-water fishing nation from 1980 onwards.

Figure 23:

These figures relate to ships licensed to fish in FICZ by the Falkland Islands Government.

Following the declaration of the FICZ and FIOCZ in 1984-85 it has become possible, for the first time, to control the total volume of catch. Note however that the Argentine fishing fleets have caught more than twice the tonnage in their own EEZ during the same period.

Figure 24:

The jigging and trawling methods of fishing dominate in the FICZ. Jigging is the method used in the *Illex* squid fishery; its use has declined since 1999 as catches of *Illex* squid have declined.

Long-lining is used exclusively for the highly lucrative, but heavily controlled, Patagonian Tooth Fish fishery.

Figure 25:

The fishery for both species of squid constitutes approximately 70% of the fishing operations conducted in the FICZ.

Figures 26 and 27:

Although the yearly revenue from licence fees has declined from the heights reached during the initial years of the fishing industry, it nevertheless is a significant amount of money which has radically improved the Islands financial position.

Figure 28:

Note the high fiscal dependency of the Islands Government on the fishing industry. Most of the taxation income comes from the taxation of fishing companies; investment income is mainly derived from funds invested as the result of budget

surpluses caused by high level of fishing licence revenue.

Figure 29:

Although the income of the Government of SGSSI is small in comparison with that of the Islands, it is at its highest level since the demise of the whaling industry.

Antarctic Cod and the various species of Ice Fish were heavily overfished before the current regulatory system was introduced.

Krill is currently (2004) the major target species; the Tooth Fish fishery is small in total tonnage caught, but the value of the catch is very high.

Figure 30:

The Government of South Georgia and the South Sandwich Islands has income from tourist landing fees, the sale of stamps, entrance fees to Whaling Museum, but the majority of this income comes from the fishing industry.

The current (2004) income produced by the sale of fishing licences by the Government of SGSSI is approximately £2.2M.