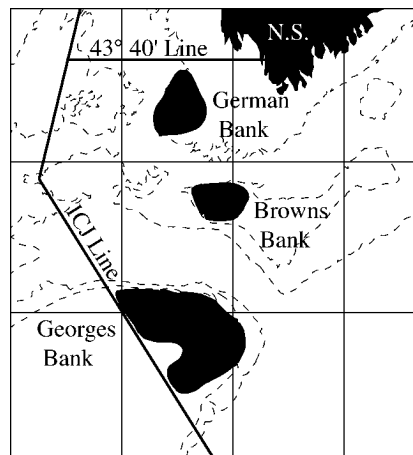


Georges Bank Scallop



Background

The Sea Scallop, *Placopecten magellanicus*, is found in the Northwest Atlantic, from Cape Hatteras to Labrador. Scallops are aggregated in patches and harvestable concentrations are called bed. Major areas of offshore fishing activity are Georges Bank, the Scotian Shelf (Middle Grounds, Sable Island Bank, Western Bank, Browns Bank, and German Bank), and St. Pierre Bank. Scallops prefer a sandy, gravel bottom and occur in depths of 35 to 120 m.

Scallops have separate sexes. They mature at age 2. The female gonad is red in colour and the male gonad colour is creamy white. The major spawning period is August to October. The fertilized eggs develop through several stages in the water column until settlement on the bottom within 30 to 60 days.

Growth is estimated from the position of annual rings on the shell. The growth rate varies from one area to another and is influenced by season, depth, and temperature.

Offshore scallop vessels range from 27 to 46 m length overall. The offshore fleet uses a New Bedford offshore scallop rake or drag, 4 to 4.9 m in width. Two drags are fished simultaneously, one on each side of the vessel.

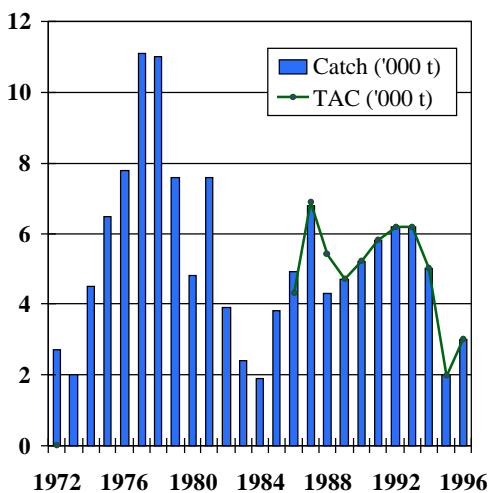
The Fishery

Landings (thousands of tonnes)

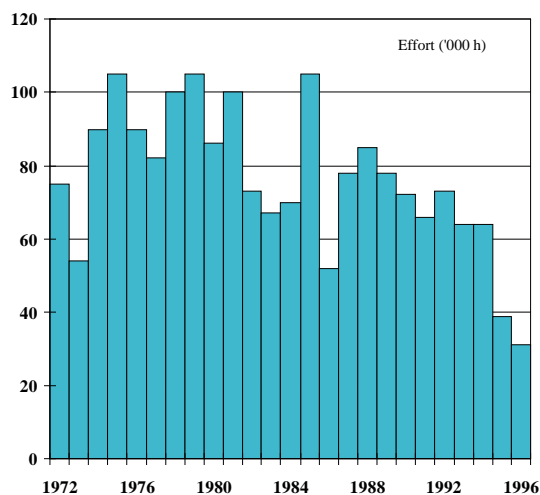
Year	79-79 Avg.	80-89 Avg.	1992	1993	1994	1995	1996
TAC	-	-	6.2	6.2	5.0	2.0	3.0
Catch	5.9	5.1	6.2	6.2	5.0	2.0	3.0

The offshore fishery was conducted on a competitive basis until the mid 1980's. Management measures were limited entry and meat count. The jurisdiction for fisheries on Georges Bank was settled by the World Court in October 1984. An Enterprise Allocation regime was implemented for Georges Bank in 1986 and the meat count was reduced to 33 per 500 g. There were 77 active vessels in 1984. Today, less than half the initial number of vessels are involved in the Georges Bank fishery. The fishery directs primarily for ages 4 to 7 scallops.

In 1995 a monitoring program to discourage the presence of small meats in the catch (50+ meats per 500 g) was implemented. A low tolerance level (10% by number of meats 10 g or less) adds more restriction to the regulatory 33 meat count (33 meats per 500 g).



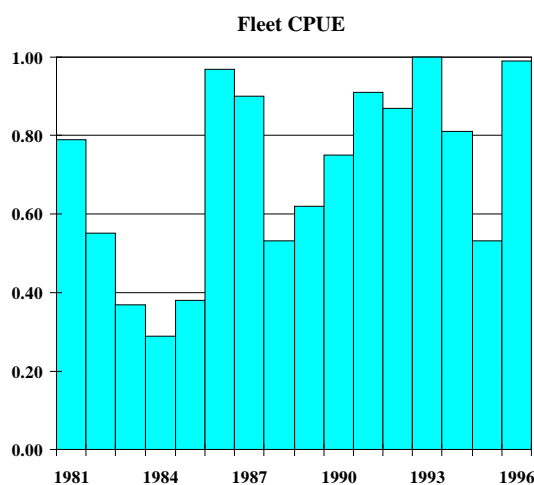
The 1996 TAC was set at 3,000 t. This is a 50% increase over the 1995 level. The TAC had been set upward with the advent of a stronger year class in the fishery, the 1992 year class at age 4. The 1996 fishery was highly dependent on that incoming year class.



Effort has dropped about 20% from 1995 to 1996. It was highly concentrated on the Northern Edge of Georges Bank. A minimum of fishing activities took place on the southeast side.

Resource Status

Logbooks provide catch and effort data from which catch-rate (CPUE) is estimated. Landings are monitored at dockside. Catch in numbers at age are derived from port samples. Relative biomass indices are derived from research surveys. Estimates of population abundance are based on commercial CPUE, research survey biomass indices, and age composition in the stock.



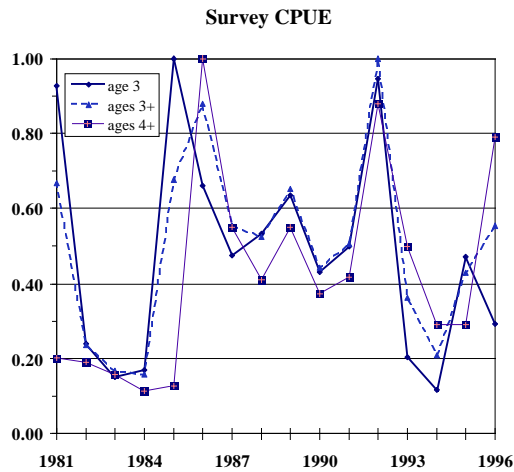
Standardised **commercial catch-rates** have been highly variable so far in the 1990's. Going up to peak in 1993, they took a dip in 1995 to rise again in 1996. The rise was sharp, 77% from 1995 to 1996. The 1996 catch-rates are almost identical to 1993 which are among the highest recorded since 1981.

The **average meat weight** in the catch increased from 1993 to 1995. The average meat weight decreased in 1996 because the fishery directed for the strong 1992 year class.

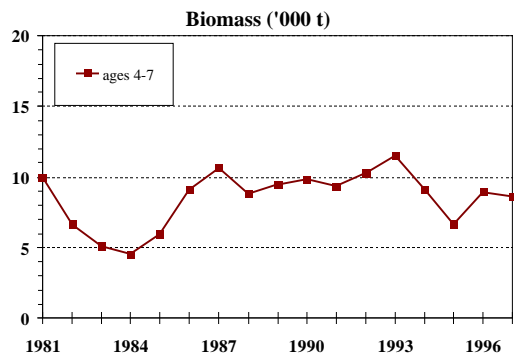
Survey catch-rates for older age groups, age 6+, remain relatively stable in 1996. Survey catch-rates for age 5 appear high. However, this is due to imprecision in attributing ages and does not reflect a strong year class. The 1992

Maritimes Region

year class, age 4, is mainly responsible for the increase in recruited densities. Abundance of age 5+ is still at very low levels on the south side of the Bank. Abundance of prerecruits continues to show improvement in 1996. However, the 1993 year class (age 3) is likely smaller than the 1992 year class. According to the latest survey results, the 1994 year class is more widely distributed than previous year classes.

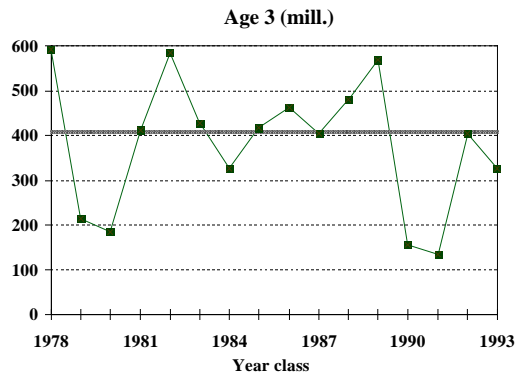
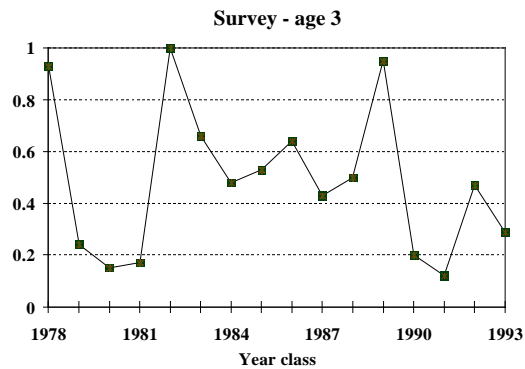


It would appear that the total biomass (ages 3+) has increased from 1995. It is concentrated mainly in young recruits (ages 3 and 4). The biomass for the directed age group 4 - 7 has also improved in 1996 due to the 1992 year class. The **directed biomass** (ages 4 - 7) will stay relatively unchanged because the new recruits will offset anticipated removals while the total biomass (ages 3+) is projected to reach high levels in 1997,.



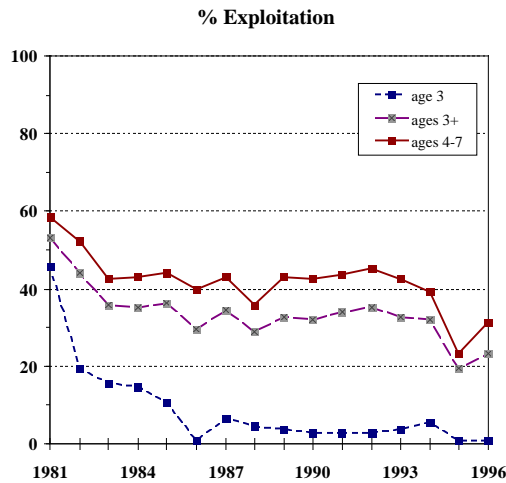
Georges Bank Scallop

In terms of recruitment the early 1990's had seen the passage of the 1988 and 1989 year classes each with 500 million scallops at age 3, followed by the 2 poorest year classes (1990 and 1991) since 1981. Recruitment has improved with the 1992 year class strength close to the long term average (thick line in graph below). Numbers at age 3 in the research surveys (Survey - age 3 graph) coincide well with the strength of these same year classes in the population estimates (Age 3 mill. graph).



The overall **exploitation rate** (ages 3+) varied little from 1988 to 1994 and was considerably lower than before the implementation of TAC's in 1986. After a sharp decrease from 1994 to 1995, it was up slightly in 1996. Exploitation on the directed ages (4 to 7) was 23% in 1995 and 31% in 1996. The exploitation rate on age 3 has stayed low since 1986 when the 33 meat count forced the fishery to direct for older scallops. Exploitation of age 3 scallops has been reduced

to almost nil with the monitoring of small meats in the catch starting in 1995.



Outlook

Keeping the TAC in 1997 at the 1996 level (3,000 t) would produce a 19% exploitation rate on the directed age group (ages 4-7) and a biomass estimate of 11,850 t at the end of 1997. A TAC of 3,700 t exploiting 24% of the directed age group leaves 11,300 t of that biomass. Directed fishing of 5,000 t increases the exploitation rate to 33% and 10,000 t of biomass remains at the end of the year.

TAC(t)	Exploitation rate	Directed Biomass (t)
3,000	19%	11,850
3,700	24%	11,300
5,000	33%	10,000

Catch levels in 1996 were up 50% from 1995. The fishery was highly dependent on the incoming 1992 year class though. Most of the effort was expended on the Northern Edge; it decreased and was minimal on the Southeast side. Catch-rates rose sharply in 1996. The average meat weight in the catch has decreased from 1995 to 1996. The weakness of the 1991 year class has resulted in the

fishery directing for the 1992 year class earlier. Research survey work has established that the strength of year classes replacing the 1990 and 1991 year classes is improving, especially on the Northern Edge. Abundance of recruited age groups is still at very low levels on the Southeast side of the Bank. Stock biomass has also increased 25% over 1995.

The fishery usually directs for age 5 scallops. The 1991 year class should have been the mainstay of the fishery in 1996. It contributed 25% by numbers to the catch. In comparison, the 1992 year class, at age 4, contributed 60% by numbers to the catch. The 1997 fishery will rely on the 1992 year class at age 5 as its main constituent. Given that the 1992 year class was fished relatively hard in 1996, it is possible that the 1993 year class, at age 4, will be a major constituent of the 1997 fishery. However, age 4 young recruits from the 1993 year class would provide more yield if fished at age 5 in 1998.

Given this information, fishing scenarios considered for 1997 should be conservative and possibly consider only a modest increase to avoid a reversal to a fishery highly dependent on the incoming year class.

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References

Robert, G. and M.A.E. Butler, 1997. Georges Bank scallop stock assessment - 1996. DFO Canadian Stock Assessment Secretariat Res. Doc. 97 / 47.

This report is available from the:

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