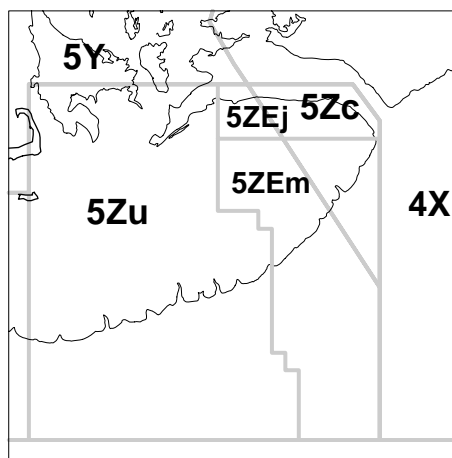


**GEORGES BANK  
SCALLOP**



### **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.	1991	1992	1993	1994	1995
TAC	-	-	5.8	6.2	6.2	5.0	2.0
Catch	5.9	5.1	5.8	6.2	6.2	5.0	2.0

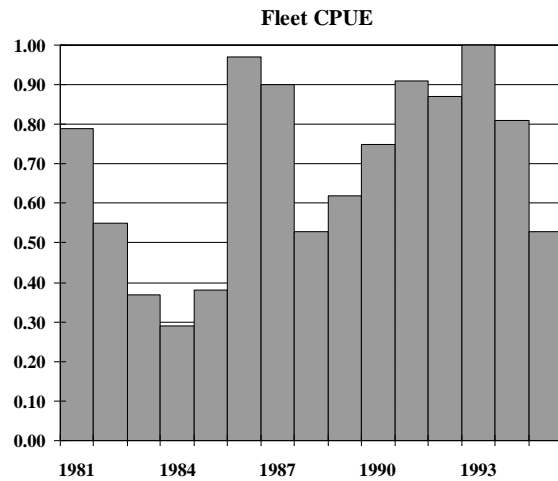
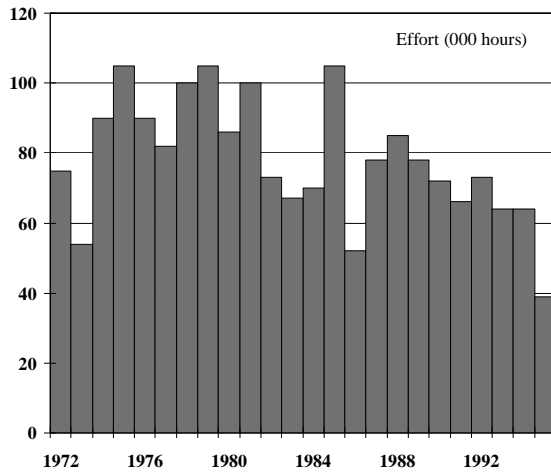
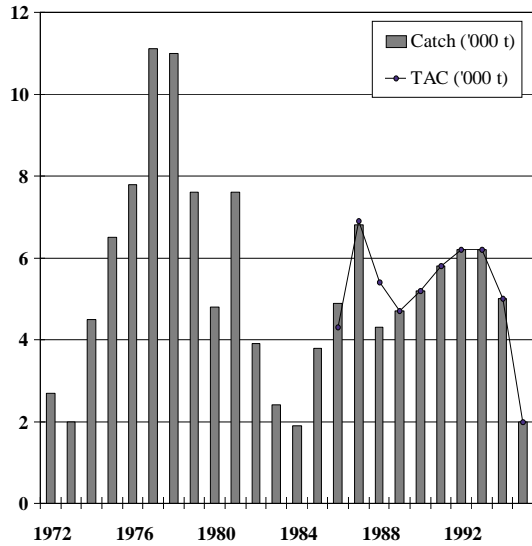
The offshore fishery was conducted on a competitive basis until the mid 1980's. Management measures were limited entry and meat count. The jurisdiction for fisheries on Georges Bank was settled by the World Court in October 1984. An Enterprise Allocation regime was implemented for Georges Bank in 1986.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

In 1995 a monitoring programme to discourage the presence of small meats in the catch (50+ meats per 500 g) was initiated during the first quarter. 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 500g).

**Available from:** Maritimes Regional Advisory Process, Department of Fisheries and Oceans, P.O. Box 1006, Stn B105, Dartmouth, N.S., Canada B2Y 4A2 Telephone: 902-426-8487. E-mail: d\_geddes@bionet.bio.dfo.ca.

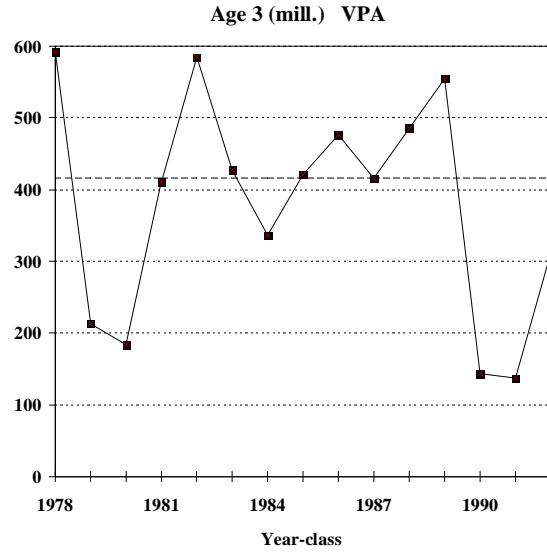
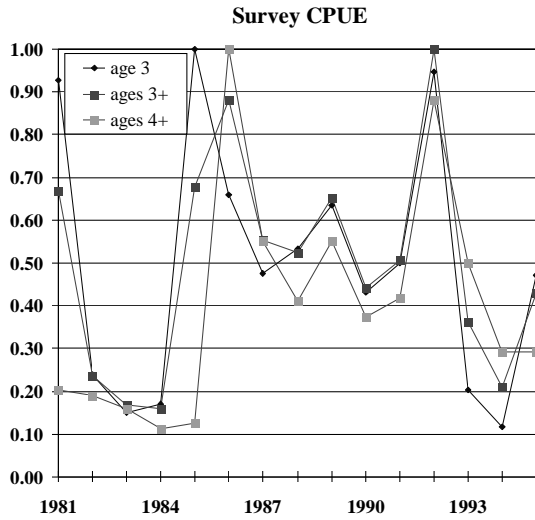
**Resource Status**

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.



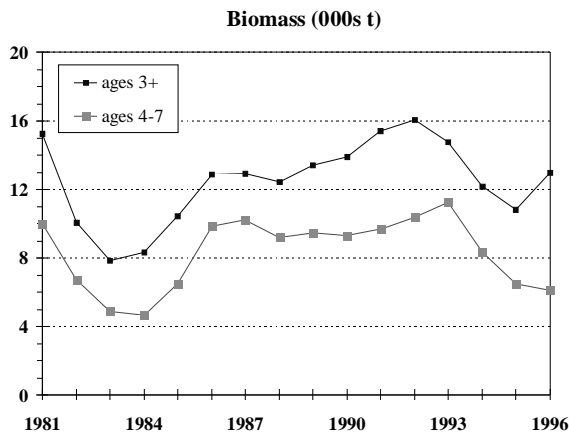
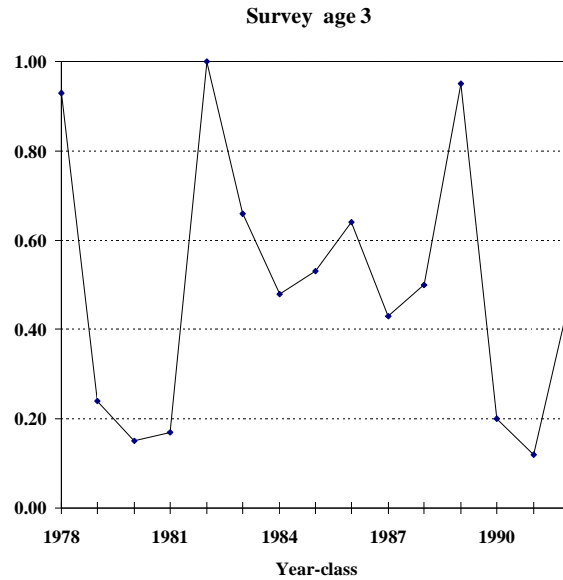
A TAC of 2,000 t had been advocated for 1995 given the weakness of the 1990 and 1991 year-classes which, at ages 4 and 5 were 2 of the main age groups directed for by the fleet. The 1995 catch level corresponded to 40% of the 1994 catch. The decline in catches follows the reduced abundance of 2 strong year-classes, 1988 and 1989, after 2 to 3 years of exploitation and weaker recruitment afterwards. Catches from the first quarter of the year had reached up to 30% of the total for the year over the last 6 years. For the first time since 1988, winter 1995 catches at 13%, are more in line with traditional levels of 10% for the first quarter. Fluctuations in the effort profile have been smaller after the implementation of allocations in 1986 similar to the catch profile. Effort also decreased by 40% from 1994 to 1995.

Commercial and survey catch-rate indices were following the same trends when the fishery was operating on a competitive basis. After that it would appear that the commercial fleet could, to some extent, maintain good CPUEs despite decreases in survey CPUEs. Annual catch-rates since 1990 are in the medium to high range, peaking in 1993. Catch-rates dropped 33% from 1994 to 1995. The 1995 research survey results indicate that the number of old scallops, ages 6+ (1989 and older year-classes), remains relatively low; the abundance of age 5 (weak 1990 year-class) has dropped 50% and the abundance of age 4 is also low (1991 year-class also poor). Abundance of pre-recruits offers some improvement. The 1992 year-class is a relatively strong year-class but on the northern Edge of the bank only. The 1993 year-class (age 2) appears to be good over a greater area of the bank.

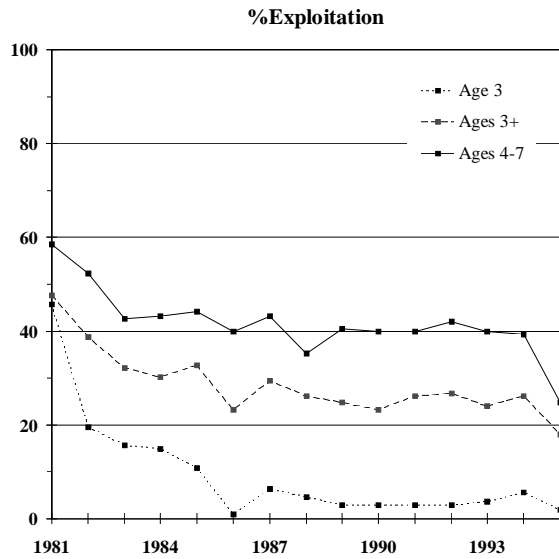


According to the population analysis, total biomass (ages 3+) had steadily increased to peak in 1992; good to excellent recruitment had been provided by the 1986, 1988, and 1989 year-classes. Biomass started to decline with incoming weaker recruitment. The 1995 biomass levels are 67% of the peak values while the biomass for ages 4 to 7 decreased to 58%.

In terms of recruitment the early 1990's had seen the passage of 2 good year-classes (1988 and 1989) with over 500 million scallops at age 3 each followed by the 2 poorest year-classes (1990 and 1991) since 1981. The latest recruitment estimate appear to be improving although it is still below the long term average (dashed line in graph). Numbers at age 3 in the research surveys coincide well with the strength of these same year-classes in the population estimates.



The overall exploitation rate (ages 3+) has varied little since 1988 and is considerably lower than before the implementation of TAC's in 1986. The overall rate decreased 30% from 1994 to 1995. Concurrently, exploitation on ages 4 to 7 was 39% in 1994 and dropped to 25% in 1995. The directed exploitation rate had averaged 40% over the last 6 years. The exploitation rate on age 3 has stayed low since 1986 when the 33 meat count forced the fishery to direct for older scallops. The monitoring programme to discourage the presence of small scallops in the catch further reduced exploitation of age 3 scallops in 1995.



**Outlook**

A fishing scenario keeping the same TAC (2,000 t) in 1996 as in 1995 would give a directed biomass estimate (ages 4-7) of 9,100 t at the end of 1996. A scenario keeping the effort at the 1995 level (2,300 t) would provide a slightly lower directed biomass estimate. Fishing at  $F_{0.1}$ , (2,900 t) in 1996 would produce a directed biomass at the end of 1996, 10% smaller than under the first scenario. The directed biomass, ages 4-7, makes up a sizeable component, 56 to 59%, of the total biomass. Exploitation rates on the directed ages range from 20 to 28% under these scenarios.

TAC(t)	Exploitation rate	Directed Biomass (t)
2,000	20%	9,100
2,300	23%	8,850
2,900	28%	8,200

The 1996 fishery will depend mainly on the 1989 and 1992 year-classes. The 1989 year-class at age 7 is represented by large scallops under 20-count. The strength of this once abundant year-class is declining. The 1992 year-class at age 4 (40-count on average) is a good year-class but on the northern Edge of the bank only. These young recruits in their first year of exploitation could contribute more yield to the fishery if fished at least a year later. Blending the small size 1992 year-class with the bigger meats 1989 year-class will take place on a large scale.

The stock needs rebuilding after the passage of the weak 1990 and 1991 year-classes into the fishery. From an historical perspective, the Georges Bank scallop stock had previously encountered a period of low stock biomass of 10,000 t or less in the early 1980's. The most recent occurrence (1995) of a drop in biomass, to about

10,500 t does not appear as prolonged. However, it would be prudent to give stock rebuilding due consideration. A larger biomass could better withstand poor recruitment or growth over the next few years.

There is a certain degree of uncertainty associated with estimating the strength of the 1992 year-class. This year-class has not been fished yet practically speaking; its presence has barely been detected in the catch data. Survey results have shown that the 1992 year-class was of moderate strength.

Given the stock composition the 1996 fishery depends on, and the recent stock history, a conservative exploitation strategy should be adopted for 1996.

**For More Information**

Contact:

Ginette Robert  
 Invertebrate Fisheries Division  
 1707 Lower Water Street  
 P.O. Box 550, Halifax  
 Nova Scotia, B3J 2S7

TEL: (902) 426-2616  
 FAX: (902) 426-1862  
 e-mail: G\_Robert@bionet.bio.dfo.ca