

USA and Canadian Catch, Effort and USA Value Associated
with the Disputed Portion of Georges Bank

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Introduction

This document presents USA catch, value and effort data from fisheries associated with the area of the Northwest Atlantic presently in dispute between the USA and Canada. These data primarily cover the period 1965-80, for the entire Georges Bank area and for the disputed zone, approximated by 10 minute latitude by 10 minute longitude squares. Catch data for the Canadian Georges Bank fisheries from 1965-79 are also presented with estimated disputed zone catches based on the assumption that 95% of Canadian catch and effort on Georges Bank occurred in the disputed zone.

Catch data for sea scallops, a species important to both countries, is also presented from 1950 to 1979. USA disputed zone catches are considered to be those from NACFI (North American Commission of Fishery Investigations) area (Figure 1), 523 and 524, while 95% of Canadian Georges Bank catches are again assumed to be from the disputed zone.

Data Base

The USA data presented here, for 1965-80, are based on the National Marine Fisheries Service, (NMFS), Northeast Fisheries Center, (NEFC), New England weighout and interview data bases. These data bases have been described in detail by Murawski et al. (1981). The weighout, or catch, value and effort data, have been summarized to areas by species groups and year, from New England Fisheries Management Council data tapes, which were created from the NEFC weighout files. These Council tapes, however, do not include all the data which is contained in the NEFC system. Under tonnage vessels, those of 5 GRT or less, are not included. Vessel trips landing Georges Bank catches in non-New England states, available from separate state files, are also not included in this data base. Individual species catches have been summarized to 12 species/species groups. However, these Council files do contain vessel characteristic data, necessary for economic analyses, which are not readily available from other sources.

The areas discussed here are: Georges Bank, defined as NACFI areas 521-526 (Figure 1) and two approximations of the disputed zone. These approximations are: NACFI areas 523 and 524; and the area northeast of a 10 minute latitude by 10 minute longitude approximation of the Canadian boundary claim (Figure 1). USA catches are reported by the NACFI statistical areas, so while these areas provide only a rough approximation of the disputed zone, catch, effort and value data from these areas are as reported. Data is only available by 10 minute squares for interviewed trips, which represent a subset of the entire catch. Trip records from the statistical areas around the disputed boundary line (522-525) were therefore prorated based on the interviewed trips from those areas, to 10 minute square locations which had been assigned to either the disputed or the non-disputed zones.

Appendix I contains a description of the method used to prorate the effort and each individual species catch on trips made by uninter-viewed vessels based on the activity of interviewed vessels having similar characteristics (year, month, NACFI area, port, ton class (1 of 7), and ton group (1 of 20)).

The general approach used was to categorize individual vessels into successively broader groups or fleets of vessels having the same value for the common characteristics. The relative activity in each fishing location (10 minute square) of the interviewed vessels was determined for each of these characteristic fleets.

The catch and effort of all the trips taken by a vessel in a month from a port to a statistical area were prorated into 10-minute squares by using the trips of the vessel when it was interviewed to provide a typical profile.

When a vessel was not interviewed for the port - month - area combination, the vessel was matched to a characteristic fleet as closely as possible, and the activity of the characteristic fleet used as the proration profile.

The species groups presented in this document for USA catch and value are those used by the New England Council, and include: cod, haddock, silver hake, pollock, redfish, yellowtail flounder, all other flounders, red and white hake, Atlantic herring, lobster, sea scallops, and total all species.

Appendix II provides a table of total USA, Georges Bank catches of these species groups for all vessel classes and states of landing, from Northwest Atlantic Fisheries Organization (NAFO) Statistical Bulletins.

Canadian catch data presented for 1965-79 are from ICNAF Statistical Bulletins. Species reported are the same as those presented for the USA.

Scallop catches from Georges Bank for each country from 1950-79 are presented separately to provide a more historical perspective of this major fishery (1950-63, Serchuk, et al 1979; and 1964-79 ICNAF data).

RESULTS

Total USA catch from Georges Bank averaged 84,632 MT between 1965-80. Declines which began in the early 1960's with the shift of many scallop vessels to the Mid-Atlantic and with the great influx of foreign vessels and subsequent declines in groundfish stocks in the area, continued through 1976. However, total USA catches have increased substantially (Table 1) since 1977, associated with rebuilding stocks and limited foreign fishing.

The major USA fisheries on Georges Bank are the mixed trawl or groundfish fisheries (primarily cod, haddock and flounder) and the scallop fishery. These four species/species groups accounted for 73.4% of the catch and 81.8% of the value of the entire USA Georges Bank fishery between 1965 and 1980.

Comparisons of estimates of catch in the disputed zone based on 10 minute square proration (Table 2) versus statistical area 523 and 524 catches (Table 3) indicate that the use of the two statistical areas may overestimate the catch from the disputed zone by about 21% (1965-80 average difference in the two estimation procedures). Therefore, the 10 minute square prorated estimates will be used here.

Total estimated USA catch from the disputed zone, based on 10 minute square proration (Table 2), accounted for 18.9% of the entire Georges Bank catch and 21.6% of the value between 1965 and 1980. The major species, in terms of weight, from the disputed zone between 1965-80 were: yellowtail flounder (33.6% of total), haddock (29.0%), cod (18.8%), and sea scallops (2.3%). However, since 1978, scallops (meat weight) have accounted for between 6.7% and 9.6% of the catch and from 30% to 50% of the value of the fishery in the disputed zone. This reflects the movement of the scallop fleet, which had shifted to the Mid-Atlantic in the mid-1960's, back to the Northeast Peak of Georges Bank.

USA effort on Georges Bank (Table 4) decreased through the late 1960's and into the mid-1970's, but has been increasing in terms of number of trips and days fished, since 1974. Effort in the disputed zone has shown the same general trends as seen throughout Georges Bank, especially since 1978 when significant numbers of scallop vessels began to return to the area.

Table 5 presents a more historical view of both the USA and Canadian scallop fisheries on Georges Bank and in the disputed zone, with catches in metric tons, meat weight for 1950-79. The USA commercial scallop fishery originated in 1884, near Mt. Desert Island, Maine; the first Canadian sea scallop fishery developed in 1886 in Mahone Bay, Nova Scotia (Serchuk, et al. 1979). However, USA sea scallop catches remained at a low level until the early 1930's when the offshore Georges Bank scallop beds became more fully exploited. The New Bedford scallop industry developed rapidly and by 1939 total annual landings reached 4,502 MT (meat weight). Although USA landings dropped dramatically during World War II, they increased markedly afterward, reaching 5,442 MT from Georges Bank, by 1950.

Canadian vessels made occasional scallop trips to Georges Bank during the late 1940's (Bourne, 1964), but their fishery did not begin until 1951, and prior to 1956 the Canadian fishery on Georges Bank was sporadic (Serchuk, et al. 1979).

USA sea scallop catches reflect the shift of effort, in 1965, from the Northeastern part of Georges Bank to the mid-Atlantic area, as noted previously. Catches in the disputed zone declined dramatically between 1964 and 1971, remaining at low levels until 1977. Catches have increased since that time as the fleet has returned to Northeastern Georges Bank. Canadian sea scallop catches increased precipitously from the late 1950's to the mid-1960's. Their catch in the disputed zone leveled off and remained relatively constant through the mid-1970's, then increased dramatically between 1974 and 1977 (to 12,427 MT, meat weight).

Total Canadian catches from Georges Bank (Table 6) averaged 22, from the disputed zone) from 1965-79. This is equivalent to 7.3% of Canadian 4VWX (Figure 2) total of 313,452 MT for the same period (Table 6). As previously described, scallops are the primary species taken by Canada on Georges Bank averaging 6,510 MT (meat weight), or 6,185 MT from the disputed zone, and representing 28.6% of their total catch between 1965 and 1979. Canada also harvested an average of 502 MT (meat weight) of scallops from 4VWX, during the same time period (Table 7).

Cod and haddock are also important components of the Canadian catch on Georges Bank, accounting for 25.7% and 25.3% of the total catch, respectively, from 1965-79. Catches of both these species declined between the mid and late 1960's and remained low until 1976. Catches of both species increased in 1977 and 1978 and declined again in 1979. Canadian catches of cod and haddock on Georges Bank, however, were only 10.7% of those taken from 4VWX during 1965-80 (817,641 MT), while haddock catches from Georges Bank were only 10.2% of the 4VWX total (397,406 MT). With disputed zone catches estimated at 95% of the total Georges Bank catches for each species, catches of cod and haddock during 1965-79 from this area were equivalent to 10.2% and 10.7%, respectively, of the Canadian cod and haddock catches from 4VWX.

Canadian catches of cod and haddock from the disputed zone have exceeded USA catches (Table 2) from that area (based on the estimates for each country) since 1965, averaging 1.7 times and 1.2 times the USA catch annually. Lobster is also a commercially important species from the disputed portion of Georges Bank, though estimated annual catches from the USA have averaged only 123 MT and have not exceeded 374 MT, since 1965 (Table 2). Canadian lobster catches (Table 6) from the disputed

only been reported since 1971, averaging 193 MT per year.

Other species, which have been of less importance to the USA and Canadian fisheries in the disputed portion of Georges Bank, are also presented in Tables 1 through 3 and in Tables 6 and 7. Table 7 provides Canadian catches from ICNAF Divisions 4VWX, for the same species presented for the USA and Canada in previous Tables. This is to provide a means of comparison of the relative importance of the Georges Bank fishery to the Canadian's fishery on the Scotian Shelf (4WX) and Banquereau Bank (4V).

LITERATURE CITED

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Table 1. USA Catch¹ and value, by species group, from Georges Bank, 1965-1980.

| | Cod | Haddock | Silver Hake | Yellow-tail | Flounder (NS) | Red and White Hake | Pollock | Redfish | Herring | Loe st er | Scallop | Total |
|------------------------|-------|---------|-------------|-------------|---------------|--------------------|---------|---------|---------|----------------------|---------|--------|
| Metric Tons | | | | | | | | | | | | |
| 1965 | 10326 | 52300 | 11064 | 33119 | 12614 | 1572 | 3086 | 1926 | 161 | 1700 | 1482 | 166475 |
| 1966 | 10406 | 52085 | 16223 | 26943 | 15376 | 664 | 2165 | 2522 | 218 | 1225 | 891 | 159515 |
| 1967 | 10990 | 34134 | 12680 | 19938 | 12596 | 362 | 1511 | 3693 | 194 | 1371 | 1229 | 138204 |
| 1968 | 12115 | 24820 | 6195 | 21436 | 7564 | 382 | 1539 | 2505 | 8 | 1005 | 933 | 81431 |
| 1969 | 13311 | 15747 | 1632 | 22473 | 9381 | 444 | 2163 | 2375 | 792 | 1074 | 1324 | 71410 |
| 1970 | 11303 | 8044 | 4220 | 24037 | 10191 | 539 | 2170 | 1983 | 273 | 1267 | 1414 | 66622 |
| 1971 | 12458 | 7017 | 3063 | 17990 | 10478 | 942 | 2966 | 3717 | 1208 | 1055 | 1320 | 62998 |
| 1972 | 10195 | 3684 | 879 | 18837 | 8145 | 876 | 2037 | 6007 | 11 | 1039 | 820 | 53191 |
| 1973 | 12485 | 2681 | 5704 | 21398 | 6560 | 695 | 2086 | 4943 | 161 | 672 | 1079 | 59431 |
| 1974 | 14104 | 2308 | 2285 | 19442 | 6651 | 699 | 2536 | 3223 | 171 | 1165 | 925 | 55350 |
| 1975 | 12102 | 3826 | 4584 | 15961 | 8494 | 505 | 2904 | 3113 | 2 | 1424 | 875 | 56055 |
| 1976 | 12331 | 2844 | 3793 | 14064 | 7117 | 397 | 3770 | 2142 | 507 | 1348 | 1711 | 52496 |
| 1977 | 18565 | 7842 | 3747 | 12067 | 9317 | 613 | 4547 | 3153 | 0 | 1172 | 4442 | 69476 |
| 1978 | 20959 | 11981 | 6390 | 7629 | 10573 | 718 | 5276 | 2279 | 1 | 1621 | 5441 | 78472 |
| 1979 | 26655 | 14149 | 884 | 9602 | 10607 | 889 | 5401 | 5110 | 5 | 1460 | 6181 | 85492 |
| 1980 | 33120 | 17311 | 1159 | 12529 | 13471 | 924 | 6146 | 2279 | 165 | 1068 | 5364 | 97494 |
| Dollars (x1000) | | | | | | | | | | | | |
| 1965 | 1830 | 11615 | 665 | 6853 | 2966 | 130 | 455 | 174 | 11 | 2186 | 2482 | 31112 |
| 1966 | 2001 | 12088 | 1638 | 7379 | 4092 | 87 | 307 | 217 | 16 | 1882 | 1101 | 32723 |
| 1967 | 2026 | 8527 | 805 | 4567 | 3322 | 59 | 205 | 293 | 17 | 2348 | 2283 | 26504 |
| 1968 | 1924 | 7306 | 430 | 4862 | 2454 | 63 | 229 | 190 | 0 | 1882 | 2520 | 22155 |
| 1969 | 2547 | 5879 | 191 | 6874 | 3101 | 63 | 278 | 210 | 32 | 2031 | 3287 | 24643 |
| 1970 | 2816 | 4083 | 832 | 8147 | 3712 | 86 | 401 | 230 | 12 | 2623 | 4249 | 27429 |
| 1971 | 3486 | 4072 | 404 | 6687 | 4072 | 136 | 529 | 438 | 53 | 2412 | 4294 | 26832 |
| 1972 | 4201 | 2980 | 239 | 8594 | 4490 | 188 | 514 | 852 | 0 | 3082 | 3675 | 29142 |
| 1973 | 5029 | 2193 | 820 | 10397 | 3674 | 179 | 568 | 971 | 11 | 2357 | 4249 | 31057 |
| 1974 | 6258 | 1798 | 389 | 10911 | 3967 | 166 | 679 | 659 | 11 | 4312 | 3400 | 34157 |
| 1975 | 6687 | 2771 | 706 | 12373 | 6269 | 138 | 824 | 842 | 0 | 5625 | 3692 | 43602 |
| 1976 | 7395 | 2673 | 552 | 12658 | 5833 | 188 | 1229 | 804 | 36 | 5522 | 7594 | 48049 |
| 1977 | 8992 | 5251 | 580 | 12546 | 7907 | 257 | 1518 | 1146 | 0 | 5147 | 16900 | 62717 |
| 1978 | 11590 | 8102 | 1521 | 10565 | 10956 | 344 | 2113 | 1070 | 0 | 7500 | 31368 | 93495 |
| 1979 | 17561 | 12954 | 232 | 10926 | 10513 | 463 | 2437 | 2561 | 1 | 6998 | 46458 | 117442 |
| 1980 | 20233 | 14432 | 362 | 13166 | 11475 | 477 | 2717 | 1228 | 21 | 5935 | 47852 | 122681 |

¹Methods: Live weight except scallops are to meat weight

Table 2. USA catch¹ and value, by species group, from the disputed portion of Georges Bank, based on proration of trips by 10 minute square interview data, 1965-1980.

| | Cod | Haddock | Silver Hake | Yellow-tail | Flounder (NS) | Red and White Hake | Pollock | Redfish | Herring | Lobster | Scallop | Total |
|------------------------|------|---------|-------------|-------------|---------------|--------------------|---------|---------|---------|---------|---------|-------|
| Metric Tons | | | | | | | | | | | | |
| 1965 | 3688 | 13862 | 1 | 5172 | 785 | 73 | 868 | 35 | 0 | 42 | 321 | 25067 |
| 1966 | 3524 | 14535 | 3 | 3309 | 821 | 60 | 566 | 48 | 0 | 44 | 95 | 23306 |
| 1967 | 2604 | 9876 | 0 | 3659 | 968 | 55 | 468 | 43 | 0 | 48 | 218 | 18083 |
| 1968 | 2835 | 6405 | 0 | 8514 | 875 | 64 | 286 | 51 | 0 | 24 | 137 | 19319 |
| 1969 | 2714 | 4781 | 0 | 10135 | 1487 | 37 | 493 | 25 | 0 | 31 | 457 | 20243 |
| 1970 | 2590 | 2496 | 185 | 8073 | 1061 | 41 | 278 | 78 | 0 | 56 | 156 | 15060 |
| 1971 | 3177 | 2532 | 224 | 5611 | 1431 | 38 | 638 | 56 | 0 | 151 | 10 | 13853 |
| 1972 | 2252 | 1274 | 20 | 5115 | 1431 | 73 | 664 | 52 | 0 | 108 | 103 | 11190 |
| 1973 | 2524 | 1204 | 0 | 6413 | 1120 | 25 | 540 | 25 | 0 | 58 | 12 | 11956 |
| 1974 | 2988 | 700 | 0 | 7094 | 1169 | 29 | 605 | 67 | 0 | 374 | 10 | 13311 |
| 1975 | 2513 | 1333 | 28 | 6098 | 1312 | 32 | 515 | 49 | 0 | 278 | 43 | 12744 |
| 1976 | 1496 | 738 | 2 | 4248 | 1037 | 18 | 527 | 65 | 0 | 294 | 13 | 8962 |
| 1977 | 3621 | 2003 | 0 | 5297 | 1747 | 37 | 402 | 112 | 0 | 140 | 320 | 14035 |
| 1978 | 4309 | 3862 | 0 | 2644 | 2005 | 59 | 607 | 267 | 0 | 170 | 1037 | 15589 |
| 1979 | 5080 | 4186 | 102 | 2633 | 1781 | 60 | 574 | 339 | 0 | 115 | 1305 | 17102 |
| 1980 | 5164 | 4461 | 6 | 1943 | 1459 | 74 | 653 | 138 | 0 | 100 | 1550 | 16177 |
| Dollars (x1000) | | | | | | | | | | | | |
| 1965 | 611 | 3072 | 0 | 1000 | 244 | 13 | 128 | 3 | 0 | 46 | 551 | 5685 |
| 1966 | 668 | 3323 | 0 | 901 | 264 | 12 | 85 | 4 | 0 | 61 | 107 | 5490 |
| 1967 | 503 | 2488 | 0 | 830 | 321 | 11 | 68 | 3 | 0 | 78 | 422 | 4762 |
| 1968 | 453 | 1859 | 0 | 1887 | 360 | 11 | 50 | 4 | 0 | 42 | 337 | 5039 |
| 1969 | 459 | 1624 | 0 | 3244 | 597 | 5 | 67 | 2 | 0 | 59 | 1071 | 7152 |
| 1970 | 621 | 1256 | 36 | 2748 | 501 | 7 | 71 | 10 | 0 | 115 | 469 | 5848 |
| 1971 | 810 | 1338 | 27 | 2210 | 660 | 6 | 130 | 6 | 0 | 348 | 35 | 5566 |
| 1972 | 953 | 982 | 4 | 2375 | 898 | 18 | 163 | 8 | 0 | 291 | 441 | 6254 |
| 1973 | 977 | 864 | 0 | 2963 | 753 | 6 | 138 | 6 | 0 | 186 | 42 | 6074 |
| 1974 | 1383 | 468 | 0 | 3731 | 749 | 9 | 172 | 16 | 0 | 1384 | 40 | 8563 |
| 1975 | 1381 | 850 | 4 | 4482 | 1108 | 10 | 141 | 12 | 0 | 1047 | 186 | 10536 |
| 1976 | 923 | 613 | 0 | 3422 | 919 | 11 | 212 | 27 | 0 | 1208 | 57 | 8752 |
| 1977 | 1833 | 1216 | 0 | 5516 | 1727 | 22 | 167 | 40 | 0 | 648 | 1415 | 13280 |
| 1978 | 2304 | 2489 | 0 | 3633 | 2368 | 35 | 247 | 107 | 0 | 776 | 5622 | 19013 |
| 1979 | 3419 | 3599 | 18 | 2954 | 1997 | 32 | 240 | 167 | 0 | 514 | 10078 | 25584 |
| 1980 | 3484 | 4226 | 2 | 1972 | 1397 | 65 | 340 | 86 | 0 | 481 | 13824 | 27666 |

1) Metric tons, live weight, except Scallops are in meat weight

Table 3. USA catch by species group, from the disputed portion of Georges Bank, (Statistical Areas 523 and 524), 1965-80.

| | Cod | Haddock | Silver Hake | Yellowtail | Flounder (NS) | Red and White Hake | Pollock | Redfish | Herring | Lobster | Scallops | Total |
|-------------|------|---------|----------------|------------|------------------|-----------------------|---------|---------|---------|---------|----------|-------|
| Metric Tons | | | | | | | | | | | | |
| 1965 | 4276 | 17676 | 1 | 9145 | 1187 | 75 | 978 | 38 | 0 | 51 | 413 | 34079 |
| 1966 | 3861 | 17701 | 3 | 4583 | 1158 | 64 | 609 | 50 | 0 | 72 | 143 | 28573 |
| 1967 | 3116 | 12013 | 0 | 5107 | 1353 | 62 | 521 | 49 | 0 | 103 | 268 | 22812 |
| 1968 | 3231 | 7621 | 0 | 9955 | 1146 | 69 | 314 | 53 | 0 | 64 | 163 | 22766 |
| 1969 | 3673 | 6609 | 0 | 12516 | 1996 | 52 | 564 | 39 | 0 | 136 | 522 | 26231 |
| 1970 | 3218 | 3158 | 293 | 10181 | 1580 | 51 | 306 | 88 | 0 | 151 | 191 | 19295 |
| 1971 | 4388 | 3536 | 727 | 6494 | 1996 | 57 | 719 | 77 | 0 | 175 | 23 | 18280 |
| 1972 | 2709 | 1554 | 50 | 6066 | 1786 | 94 | 695 | 60 | 0 | 115 | 133 | 13415 |
| 1973 | 3063 | 1394 | 0 | 7877 | 1598 | 30 | 549 | 37 | 0 | 94 | 17 | 14869 |
| 1974 | 3791 | 954 | 43 | 7945 | 1537 | 38 | 648 | 74 | 0 | 463 | 19 | 15966 |
| 1975 | 3131 | 1704 | 28 | 7177 | 1986 | 40 | 587 | 76 | 0 | 409 | 115 | 16200 |
| 1976 | 2036 | 972 | 1 | 5718 | 1802 | 18 | 600 | 65 | 0 | 318 | 45 | 12279 |
| 1977 | 4254 | 2427 | 2 | 5914 | 2603 | 42 | 525 | 116 | 0 | 168 | 407 | 16846 |
| 1978 | 5464 | 4730 | 269 | 3092 | 2786 | 67 | 748 | 275 | 0 | 217 | 1291 | 20365 |
| 1979 | 6406 | 5207 | 102 | 3210 | 2557 | 66 | 650 | 377 | 0 | 206 | 1623 | 21563 |
| 1980 | 6420 | 5614 | 10 | 2522 | 2066 | 82 | 741 | 146 | 0 | 137 | 1851 | 20320 |

Table 4. USA EFFORT ON GEORGES BANK AND IN THE DISPUTED ZONE, 1965-1980.

| Year | Georges Bank | | | Disputed Zone ¹ | | | Disputed Zone ² |
|------|--------------|-------------|-------------|----------------------------|-------------|-------------|----------------------------|
| | No. of Trips | Days Fished | Days Absent | No. of Trips | Days Fished | Days Absent | No. of Trips |
| 1965 | 6643 | - | - | 773 | 6376 | 4483 | 1158 |
| 1966 | 6673 | - | - | 711 | 5755 | 4071 | 917 |
| 1967 | 6120 | - | - | 726 | 6022 | 4001 | 956 |
| 1968 | 5168 | 29505 | 19158 | 874 | 6763 | 4452 | 1040 |
| 1969 | 4739 | 28551 | 18419 | 1043 | 7964 | 5265 | 1354 |
| 1970 | 4847 | 29058 | 18345 | 806 | 6231 | 3995 | 1062 |
| 1971 | 4895 | 27842 | 18145 | 755 | 5773 | 3744 | 983 |
| 1972 | 4667 | 27808 | 16453 | 717 | 5824 | 3563 | 871 |
| 1973 | 4385 | 25990 | 15368 | 626 | 4769 | 2879 | 801 |
| 1974 | 5149 | 29310 | 17358 | 903 | 7206 | 4546 | 1099 |
| 1975 | 5601 | 32009 | 19064 | 908 | 7722 | 4669 | 1267 |
| 1976 | 5262 | 29122 | 20202 | 635 | 5621 | 3463 | 880 |
| 1977 | 6632 | 31886 | 23418 | 780 | 6769 | 4149 | 939 |
| 1978 | 7379 | 37502 | 26832 | 839 | 7131 | 4346 | 1125 |
| 1979 | 8235 | 45568 | 30316 | 1102 | 9661 | 5474 | 1395 |
| 1980 | 9402 | 51415 | 31999 | 1139 | 9623 | 5731 | 1440 |

- Not available

1) Estimated based on proration to 10 minute square areas

2) Estimated based on statistical areas 523-524 trips

Table 5. USA and Canadian sea scallop catches (meat weight in metric tons) from Georges Bank¹ and estimated from the disputed zone, 1950-80.

| Year | <u>Georges Bank</u> | | <u>Disputed Zone</u> | |
|------|---------------------|------------|------------------------|--------------------------|
| | USA/8.33 | CANADA/8.3 | USA ² /8.33 | CANADA ³ /8.3 |
| 1950 | 5442 | | 1906 | |
| 1951 | 5714 | 91 | 2088 | 86 |
| 1952 | 5508 | 91 | 3708 | 86 |
| 1953 | 7419 | 136 | 4762 | 129 |
| 1954 | 7054 | 91 | 3824 | 86 |
| 1955 | 8329 | 136 | 4686 | 129 |
| 1956 | 7966 | 317 | 5255 | 301 |
| 1957 | 7874 | 771 | 5840 | 735 |
| 1958 | 6555 | 1470 | 4829 | 1397 |
| 1959 | 8512 | 2721 | 3675 | 2585 |
| 1960 | 9968 | 3390 | 3755 | 3220 |
| 1961 | 10660 | 4565 | 7033 | 4337 |
| 1962 | 9725 | 5715 | 6185 | 5429 |
| 1963 | 7938 | 5898 | 3742 | 5603 |
| 1964 | 6265 | 5922 | 1770 | 5626 |
| 1965 | 1483 | 4434 | 413 | 4212 |
| 1966 | 891 | 4878 | 143 | 4634 |
| 1967 | 1225 | 5019 | 267 | 4768 |
| 1968 | 1025 | 4820 | 162 | 4579 |
| 1969 | 1325 | 4318 | 520 | 4102 |
| 1970 | 1415 | 4097 | 190 | 3892 |
| 1971 | 1329 | 3908 | 23 | 3712 |
| 1972 | 821 | 4161 | 133 | 3953 |
| 1973 | 1080 | 4223 | 17 | 4012 |
| 1974 | 929 | 6137 | 19 | 5830 |
| 1975 | 857 | 7414 | 115 | 7043 |
| 1976 | 1770 | 9761 | 45 | 9273 |
| 1977 | 4823 | 13089 | 406 | 12427 |
| 1978 | 5589 | 12189 | 1286 | 11580 |
| 1979 | 6202 | 9208 | 1617 | 9208 |
| 1980 | 5620 | 5221 | 1851 | 4960 |

¹1950-1963 from Serchuk et al. 1979
1964-1979 from ICNAF Statistics

²Statistical Area 523 + 524 landings

³Estimated as 95% of 5Ze catches

Table 6a. Canadian catch¹ of major species, from Georges Bank, ICNAF Division 5Ze, 1965-79.

| Year | Cod | Haddock | Silver Hake | Pollock | Redfish | Yellowtail Flounder | Other Flounders | Red and White Hake | Herring | Lobster | Scallop | Total All Species |
|------|-------|---------|----------------|---------|---------|------------------------|--------------------|-----------------------|---------|---------|---------|----------------------|
| 1965 | 10958 | 14889 | - | 1885 | 17 | 207 | 554 | 26 | - | - | 4434 | 35123 |
| 1966 | 15601 | 18159 | - | 3940 | 128 | 104 | 568 | 11 | - | - | 4878 | 9161 |
| 1967 | 8232 | 13040 | - | 4754 | 119 | 134 | 731 | 23 | 1306 | - | 5019 | 37189 |
| 1968 | 9122 | 9292 | - | 1666 | 169 | 116 | 476 | 80 | 13674 | - | 4820 | 42596 |
| 1969 | 5997 | 3990 | - | 2403 | 235 | 329 | 334 | 30 | 945 | - | 4318 | 21154 |
| 1970 | 2583 | 1978 | - | 825 | 251 | 71 | 236 | 34 | 7 | - | 4097 | 12191 |
| 1971 | 2979 | 1630 | - | 1556 | 149 | 105 | 162 | 82 | 12863 | 101 | 3908 | 24787 |
| 1972 | 2540 | 609 | - | 1199 | 110 | 8 | 79 | 32 | 53 | 204 | 4161 | 9848 |
| 1973 | 3220 | 1563 | - | 1466 | 26 | 12 | 99 | 100 | 5083 | 228 | 4223 | 16750 |
| 1974 | 1374 | 462 | 1 | 2859 | 20 | 4 | 74 | 196 | 217 | 178 | 6137 | 12123 |
| 1975 | 1847 | 1358 | 2 | 4329 | 49 | 8 | 79 | 129 | - | 220 | 7414 | 15959 |
| 1976 | 2320 | 1354 | - | 2056 | 184 | 5 | 81 | 195 | - | 133 | 9761 | 16560 |
| 1977 | 6173 | 2909 | - | 3176 | 204 | 38 | 147 | 169 | 2 | 242 | 13089 | 27046 |
| 1978 | 8904 | 10179 | - | 4413 | 82 | 57 | 261 | 135 | - | 285 | 12189 | 37287 |
| 1979 | 6011 | 5182 | - | 2459 | 21 | 17 | 94 | 149 | - | 240 | 9208 | 24082 |

¹From ICNAF Statistical Bulletins: 5Z for 1965-67; 5Ze for 1968-1979.

Table 6b. Estimated Canadian catch of major species from the disputed zone¹, 1965-79.

| Year | Cod | Haddock | Silver hake | Pollock | Redfish | Yellow-tail Flounder | Other Flounder | Red & White Hake | Herring | Lobster | Scallops | Total all Species |
|------|-------|---------|-------------|---------|---------|----------------------|----------------|------------------|---------|---------|----------|-------------------|
| 1965 | 10410 | 14145 | - | 1791 | 16 | 197 | 526 | 25 | - | - | 4212 | 33367 |
| 1966 | 14821 | 17251 | - | 3743 | 122 | 99 | 540 | 11 | - | - | 4634 | 8703 |
| 1967 | 7820 | 12388 | - | 4513 | 113 | 127 | 694 | 22 | 1241 | - | 4768 | 35330 |
| 1968 | 8666 | 8827 | - | 1583 | 161 | 110 | 452 | 76 | 12990 | - | 4579 | 40466 |
| 1969 | 5697 | 3791 | - | 2283 | 223 | 313 | 317 | 29 | 898 | - | 4102 | 20096 |
| 1970 | 2454 | 1879 | - | 784 | 238 | 67 | 224 | 32 | 7 | - | 3892 | 11581 |
| 1971 | 2830 | 1549 | - | 1478 | 142 | 100 | 154 | 78 | 12220 | 96 | 3713 | 23548 |
| 1972 | 2413 | 579 | - | 1139 | 105 | 8 | 75 | 30 | 50 | 194 | 3953 | 9356 |
| 1973 | 3059 | 1485 | - | 1393 | 25 | 11 | 95 | 95 | 4829 | 217 | 4012 | 15913 |
| 1974 | 1305 | 439 | 1 | 2716 | 19 | 4 | 70 | 186 | 206 | 169 | 5830 | 11519 |
| 1975 | 1755 | 1290 | 2 | 4113 | 47 | 8 | 75 | 123 | - | 209 | 7043 | 15161 |
| 1976 | 2204 | 1286 | - | 1953 | 175 | 5 | 76 | 185 | - | 126 | 9273 | 15732 |
| 1977 | 5864 | 2764 | - | 3017 | 194 | 36 | 140 | 161 | 2 | 230 | 12435 | 26594 |
| 1978 | 8459 | 9670 | - | 4192 | 78 | 54 | 248 | 128 | - | 271 | 1580 | 35423 |
| 1979 | 5710 | 4923 | - | 2336 | 20 | 16 | 89 | 142 | - | 228 | 8748 | 22878 |

¹Estimated as 95% of Georges Bank catches for each species.

Table 7. Canadian catches¹ of major species from ICNAF Divisions 4VWX, 1965-79.

| Year | Cod | Haddock | Silver Hake | Pollock | Redfish | Yellowtail Flounder | Other Flounders | Red and White Hake | Herring | Lobster | Sea Scallop | Total All Species |
|------|-------|---------|----------------|---------|---------|------------------------|--------------------|-----------------------|---------|---------|----------------|----------------------|
| 1965 | 67340 | 31782 | - | 25272 | 4717 | 5373 | 16068 | 2048 | 125328 | - | 603 | 302773 |
| 1966 | 61367 | 39607 | - | 14259 | 10010 | 3744 | 18213 | 1895 | 180620 | - | 310 | 362957 |
| 1967 | 56436 | 40293 | - | 12280 | 9856 | 5061 | 20319 | 1234 | 191307 | - | 333 | 362963 |
| 1968 | 68214 | 38484 | 1 | 16322 | 7852 | 5259 | 21031 | 1457 | 228186 | - | 667 | 411671 |
| 1969 | 52042 | 37315 | - | 13525 | 10750 | 2693 | 18492 | 2378 | 170865 | - | 631 | 336874 |
| 1970 | 43251 | 21781 | - | 9900 | 15293 | 886 | 13599 | 2925 | 156628 | - | 413 | 292364 |
| 1971 | 52630 | 25943 | - | 20249 | 29308 | 983 | 16780 | 4904 | 131888 | 7597 | 274 | 310118 |
| 1972 | 54325 | 15449 | - | 16656 | 21869 | 1007 | 15145 | 5382 | 165757 | 5960 | 290 | 325105 |
| 1973 | 49966 | 16029 | - | 25263 | 16488 | 424 | 13486 | 5662 | 130254 | 6511 | 181 | 290410 |
| 1974 | 44423 | 13649 | 11 | 21436 | 15739 | 593 | 15514 | 5659 | 160455 | 6251 | 78 | 307816 |
| 1975 | 39673 | 17626 | 101 | 21812 | 17025 | 1083 | 12339 | 4531 | 166323 | 6683 | 142 | 296563 |
| 1976 | 43195 | 17628 | 3114 | 21452 | 12625 | 610 | 11635 | 3339 | 143607 | 4968 | 1106 | 280220 |
| 1977 | 41988 | 22771 | 10 | 21240 | 14712 | 1424 | 13063 | 3241 | 140971 | 5065 | 727 | 290461 |
| 1978 | 62472 | 31018 | 26 | 22047 | 13596 | 1610 | 12673 | 3716 | 148528 | 4006 | 614 | 329729 |
| 1979 | 80319 | 28031 | 13 | 26935 | 12240 | 2088 | 3611 | 3033 | 88993 | 5919 | 1163 | 291755 |

¹From ICNAF Statistical Bulletins

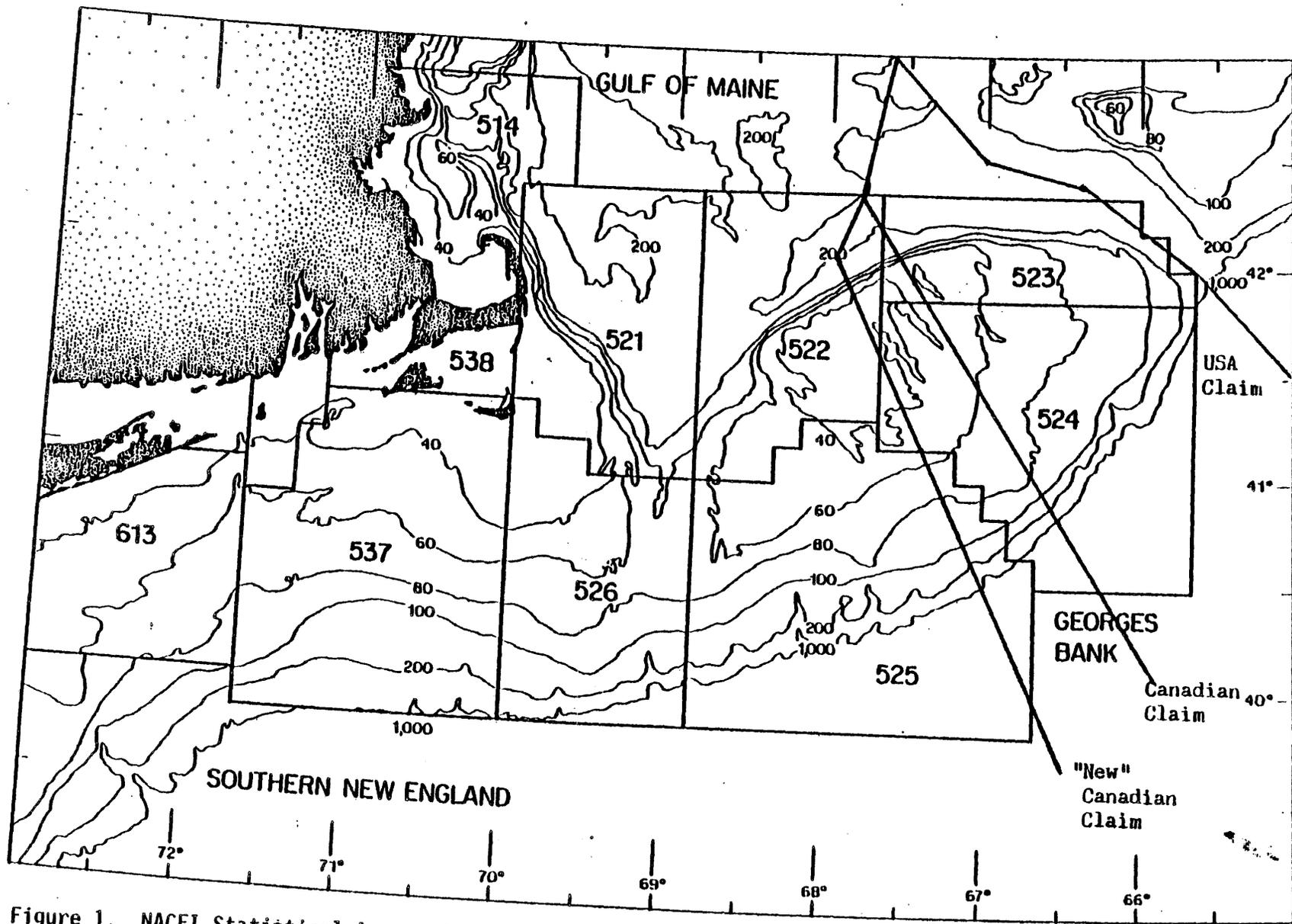


Figure 1. NACFI Statistical Areas of Georges Bank showing USA and Canadian boundary claims in relation to Statistical Areas 523 and 524.

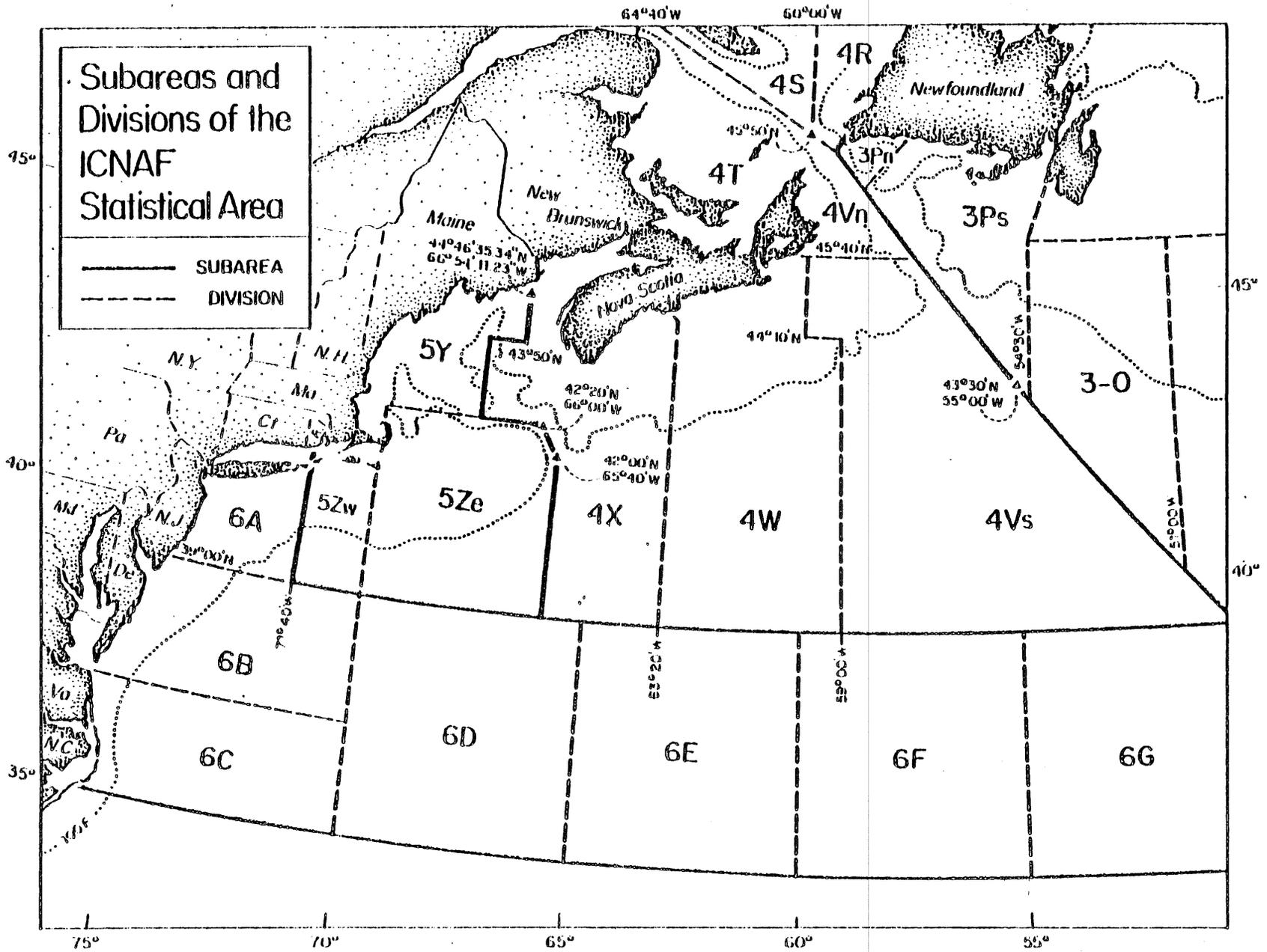


Figure 2. International Commission for the Northwest Atlantic Fisheries, Subareas and Divisions

APPENDIX I.

Rules used to prorate landings data when developing the Economic Data Base in Canadian - U.S. Maritime Dispute, spring of 1982.

1. Select all interview records for statistical areas to be prorated (for a single year at a time)
2. Four tables of ratios are calculated for the set of statistical areas.

For the parameter x, where x can be days fished, total species catch for all species combined, or one of the 11 species of the economic data file,

calculate $r(x)$ = value of x in each 10 minute square in a summary level divided by the total value of x in the summary level cell.

The four summary levels are the basis of The four Tables of ratios:

Level 1 = area, port, year, month, and vessel.

level 2 = area, port, year, month, and 2-digit ton group. (the 1st 2 digits of the 5-digit vessel code).

level 3 = area, port, year, month, and 1-digit ton class. (the first digit of 5-digit vessel code).

level 4 = area, port, and year, and month.

Within a summary level, for each parameter, the ratios for the 10-minute squares will add to 1.0.

Most of the time for the first level (vessel within port, area, month) there is only 1 unique 10-minute square fished and the ratio is therefore 1.0.

3. Apply the tables of ratios to the landed catch according to the following rules, for each vessel fishing in an area and landing in a port during a month, regardless of gear type:
 - 3.1. If the landings vessel has an entry in the level 1 table for that port, month, area combination, use that set of ratios.
 - 3.1.1 If for a species in the landings record there is a corresponding set of ratios, use them.
 - 3.1.2 If there are no ratios for a particular species, use the ratios of the total catch.

3.1.3 Use the days fished ratio to prorate days fished, days absent, and number of trips.

3.1.4 $C10 = C * r10$

where C = the vessel catch (or effort) for parameter x, in a trip(s), r10 is the ratio for parameter x in a 10-minute square, and c10 is the prorated catch (or effort) in the 10-minute square.

3.2. If the landings vessel has no matching set of ratios in that summary cell, move up to the level 2 table. If there is a matching 2-digit ton group, use those ratios in the same manner as described above. If there is no match on 2-digit ton group, try the 1-digit ton class, and use as above if there is a match.

3.3. If there is no match in the first 3 tables, then there were no interviews for this class of vessel during this port-month-area combination. The ratios of all vessel types combined (level 4) for the area, month, and port are used.

If there is an entry for the month, that set of ratios is used.

If there is not an entry for the month, an average of the ratios for the 2 months closest to the landings month is used. If landings month is earlier than the first interview month, the first interview month ratios are used. If the landings month is later than the last interview, the last interview month ratios are used.

3.4. Two alternatives were considered for the case in which there is no interview data at all for a port.

3.4.1 If there is no interview data at all for a port, an arbitrary assignment of a 10' square is made, based on the statistical area and its relation to the disputed zone.

If the landings was in 522 or 525, a 10' square in the area but out of the disputed zone is selected. If the landing was in 523 or 524, a 10' square in the area and in the disputed zone is selected.

This option was not used.

3.4.2. If there is no interview data at all in a port, that trip(s) is written to a file, to be handled later using some other criteria for proration.

This option was used, however the data was not prorated later as anticipated, and the net effect was to treat this data as though it were not in the disputed zone.

Addendum 1. Total USA catch by species group, from Georges Bank, 1965-80, metric tons.

| Year | Cod | Haddock | Silver Hake | Yellow-tail | Flounder (NS) | Red and White Hake | Pollock | Redfish | Herring | Lobster | Scallops | Misc. | Total All Species |
|------|-------|---------|-------------|-------------|---------------|--------------------|---------|---------|---------|---------|----------|-------|-------------------|
| 1965 | 10326 | 52300 | 11064 | 33119 | 12614 | 1572 | 3086 | 1926 | 161 | 1700 | 1482 | 37125 | 166475 |
| 1966 | 10406 | 52085 | 16223 | 26949 | 15376 | 664 | 2165 | 2522 | 218 | 1225 | 891 | 30797 | 159515 |
| 1967 | 10990 | 34134 | 12680 | 19938 | 12396 | 362 | 1511 | 3693 | 194 | 1971 | 1229 | 39506 | 138204 |
| 1968 | 13541 | 25197 | 6451 | 21859 | 7670 | 563 | 1586 | 2516 | 9 | 1003 | 994 | 1956 | 83345 |
| 1969 | 14954 | 16449 | 1654 | 22497 | 9446 | 515 | 2219 | 2401 | 832 | 1038 | 1925 | 867 | 74191 |
| 1970 | 13353 | 8400 | 4238 | 24058 | 10263 | 642 | 2221 | 1983 | 272 | 1266 | 1415 | 1298 | 69409 |
| 1971 | 14999 | 7301 | 3069 | 17981 | 17604 | 964 | 3037 | 3726 | 1194 | 1062 | 1929 | 1096 | 73362 |
| 1972 | 12478 | 3866 | 879 | 37654 | 15080 | 888 | 2067 | 6007 | 11 | 1046 | 821 | 861 | 81658 |
| 1973 | 14838 | 2776 | 3698 | 21373 | 6620 | 732 | 2161 | 4950 | 161 | 672 | 1080 | 1214 | 62275 |
| 1974 | 16642 | 2396 | 2283 | 19454 | 6930 | 820 | 2620 | 3220 | 172 | 1166 | 925 | 1633 | 58261 |
| 1975 | 14595 | 3969 | 4588 | 16264 | 8813 | 460 | 2976 | 3114 | 9 | 1432 | 857 | 2224 | 59295 |
| 1976 | 13941 | 2895 | 3793 | 14158 | 7789 | 496 | 3842 | 2142 | 507 | 1388 | 1770 | 2012 | 54673 |
| 1977 | 19576 | 7904 | 3749 | 12089 | 10181 | 634 | 4628 | 3158 | 1 | 1224 | 4802 | 3247 | 71193 |
| 1978 | 23787 | 12102 | 6393 | 7658 | 11417 | 759 | 5530 | 2692 | 2 | 1691 | 3569 | 5656 | 83196 |
| 1979 | 30918 | 14219 | 893 | 9763 | 11561 | 908 | 3897 | 3109 | 5 | 1508 | 6569 | 5625 | 92975 |
| 1980 | 38393 | 17401 | 1166 | 12915 | 13993 | 956 | 6779 | 2277 | 166 | 1073 | 5620 | 5459 | 106158 |
| 1981 | 32587 | 18890 | 1087 | 9666 | 13419 | 1514 | 5894 | 2948 | 22 | 998 | 8413 | 5742 | 101120 |

1) All vessels.