SKATE FIGURES

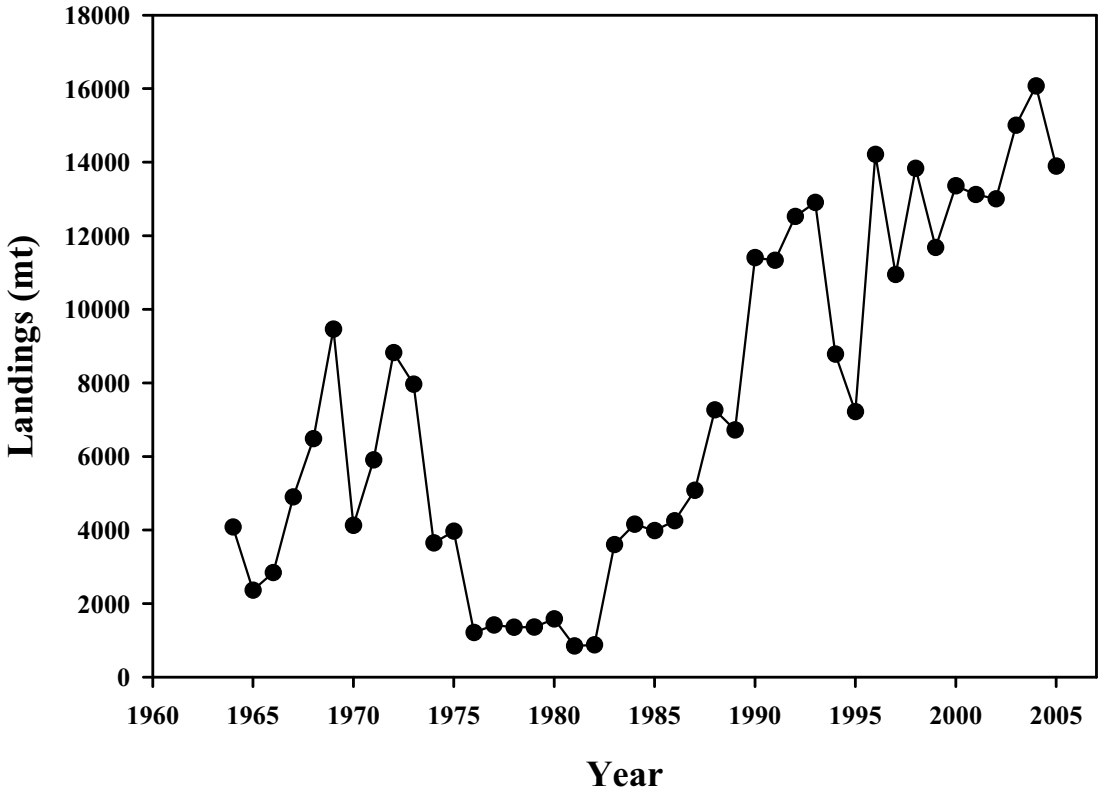


Figure B1.1. Total landings of skates in NAFO subareas 5 and 6.

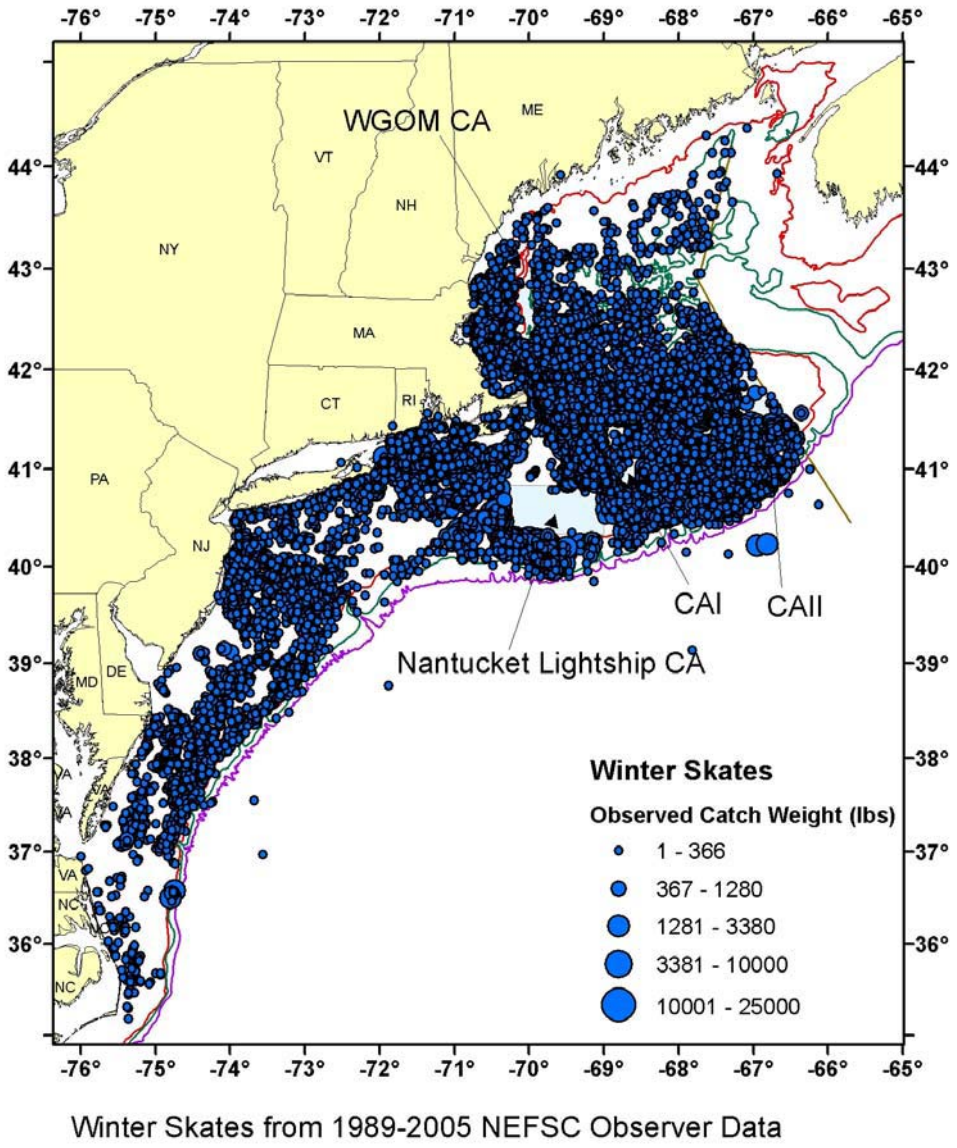
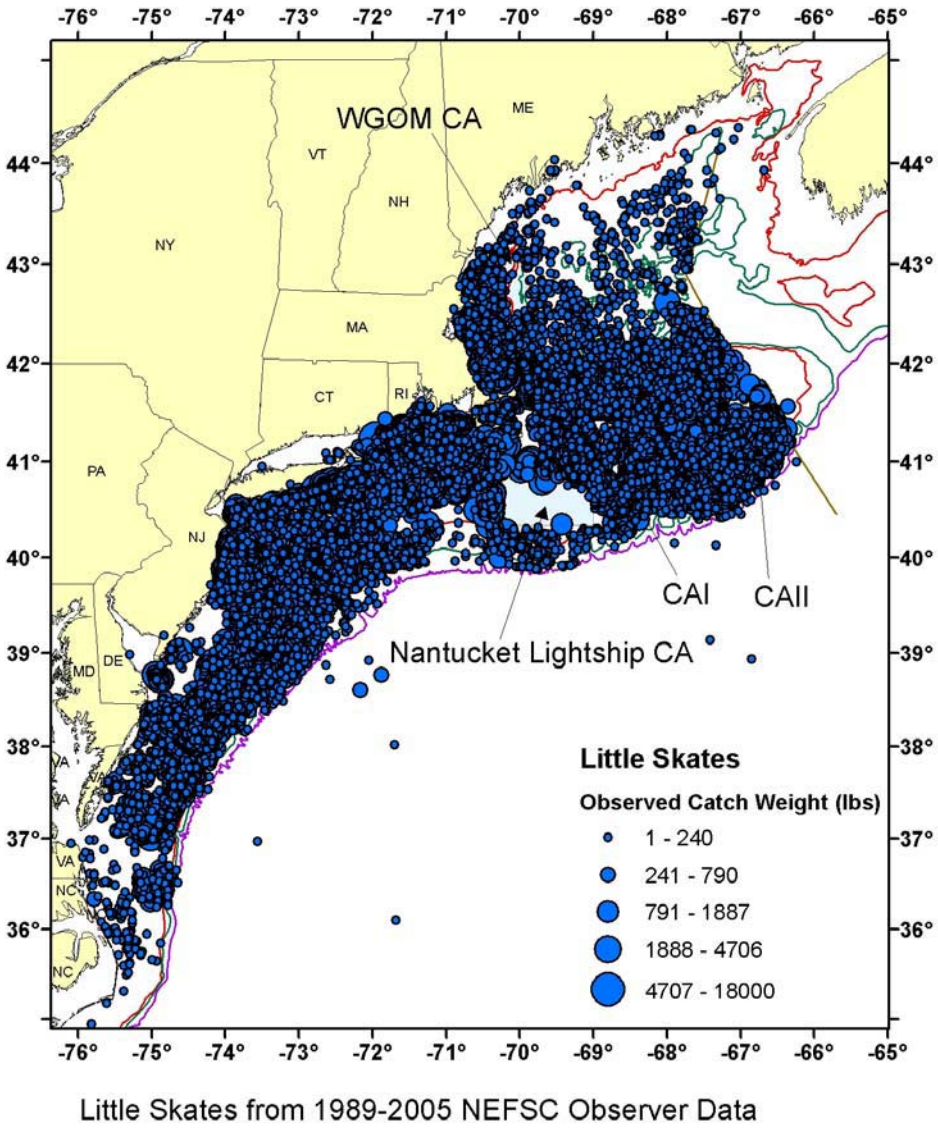


Figure B1.2. Distribution of winter skates from the Observer Program, 1989-2005.



Little Skates from 1989-2005 NEFSC Observer Data

Figure B1.3. Distribution of little skates from the Observer Program, 1989-2005.

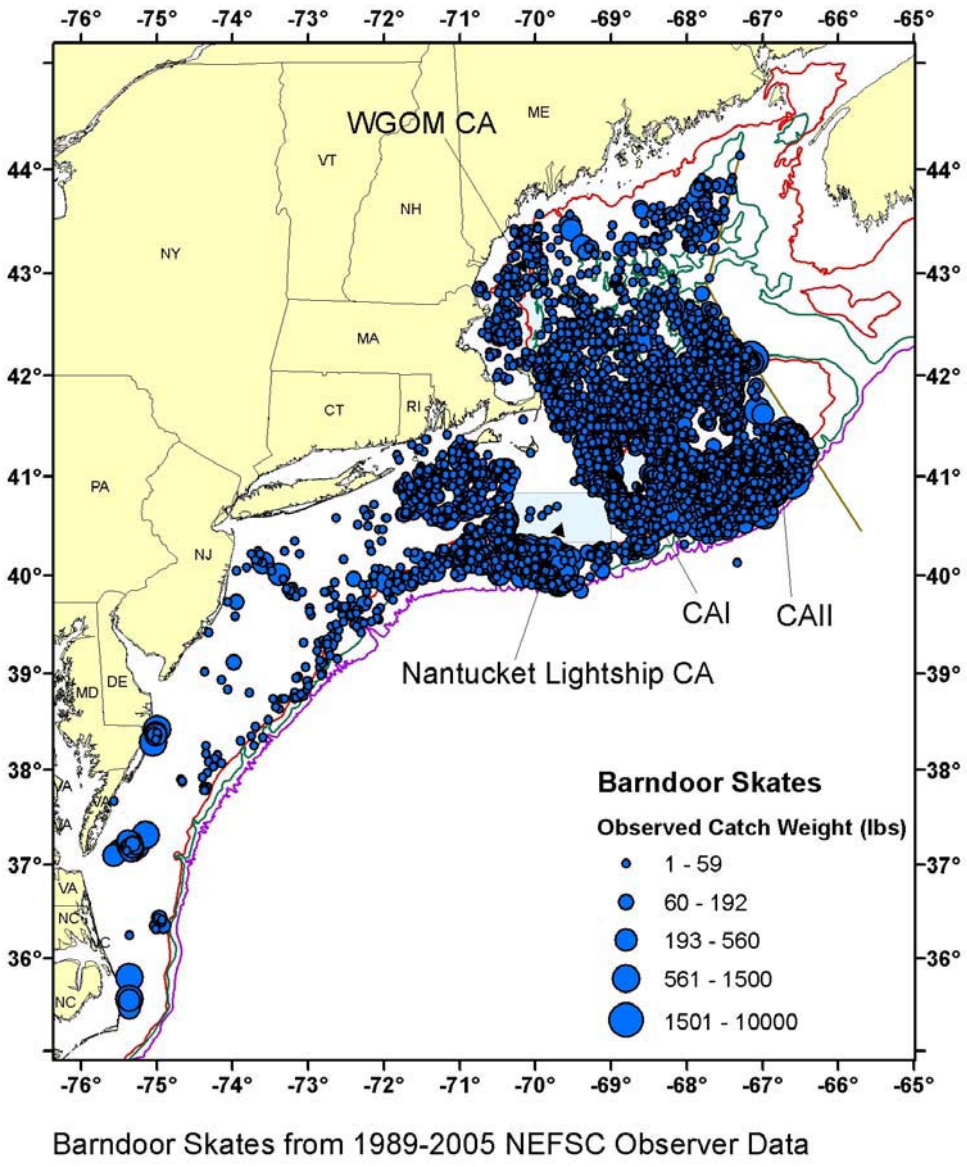
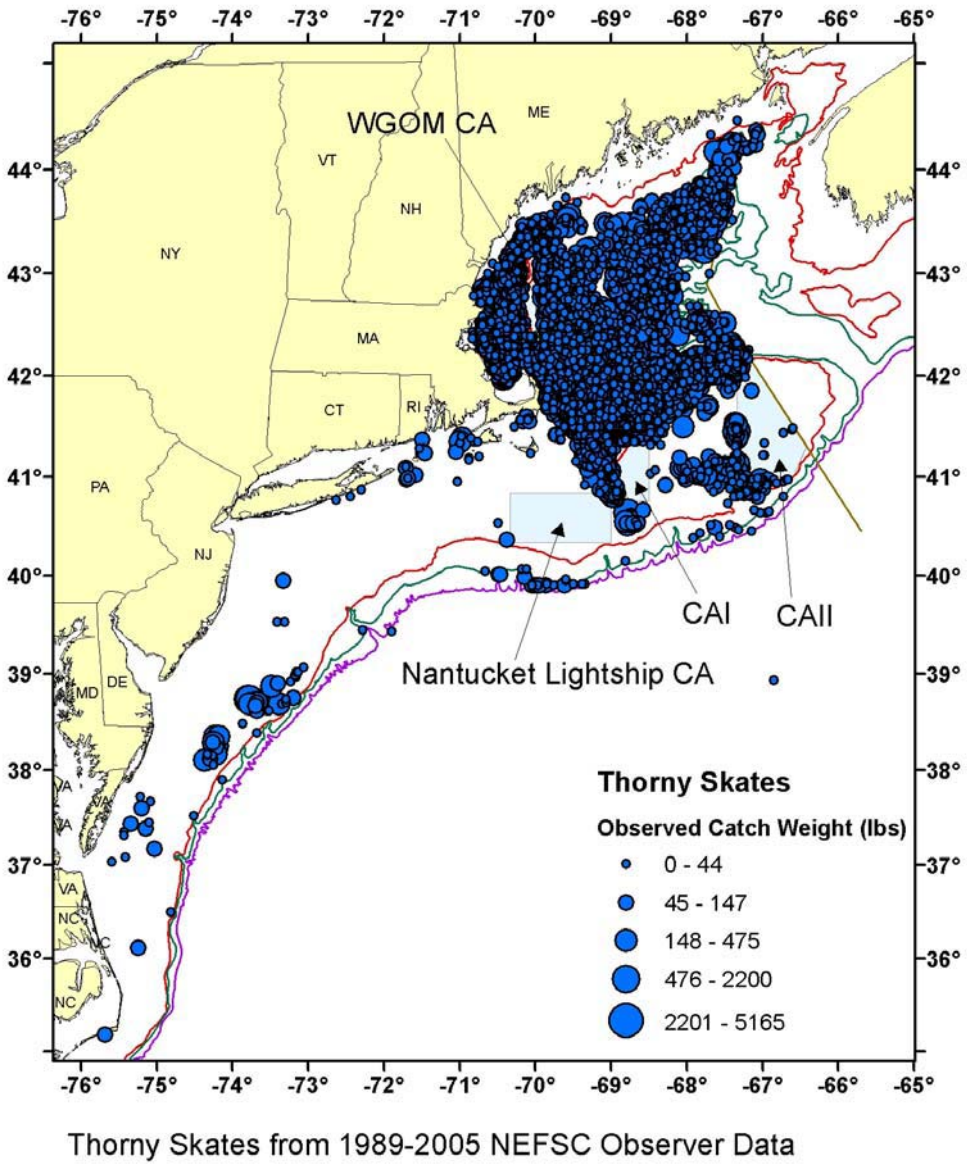
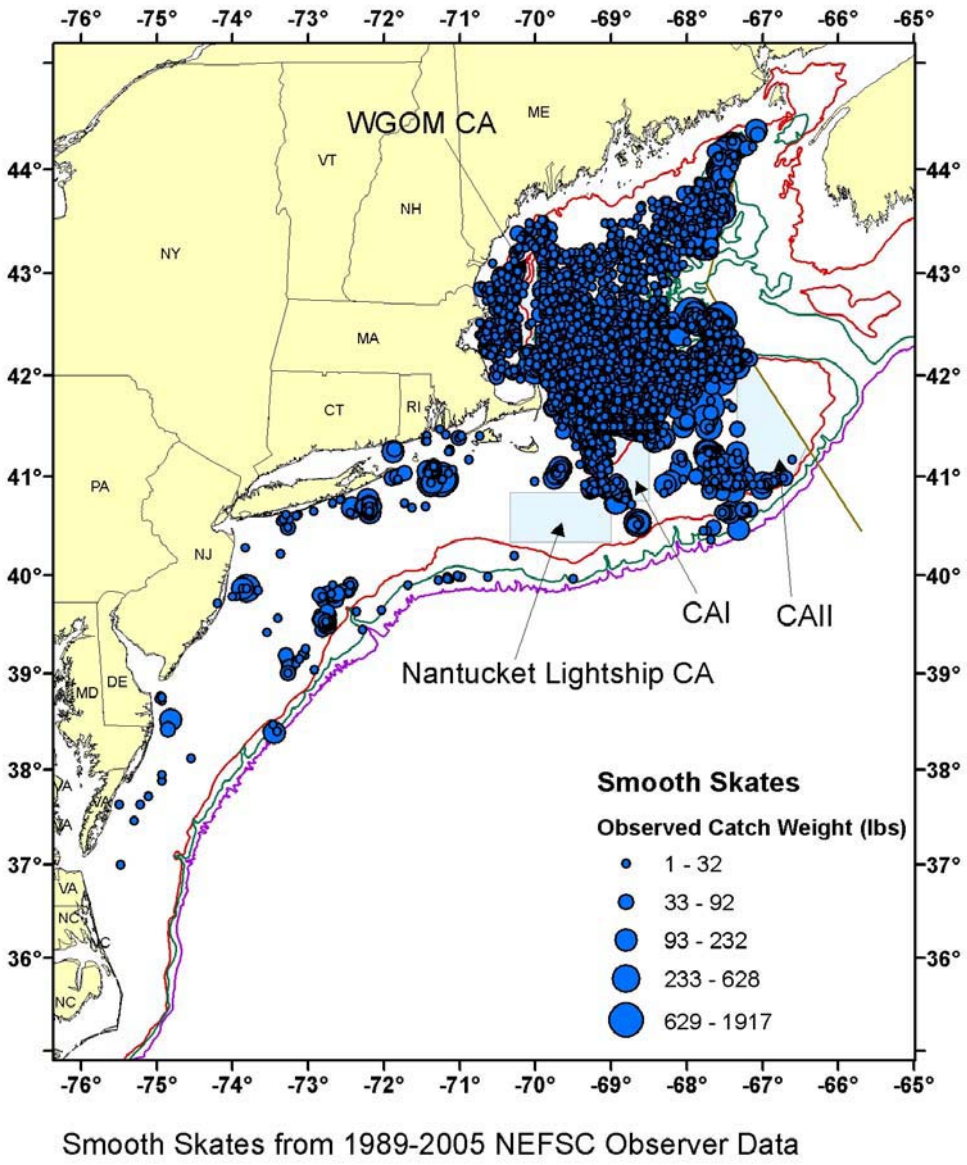


Figure B1.4. Distribution of barndoor skates from the Observer Program, 1989-2005.



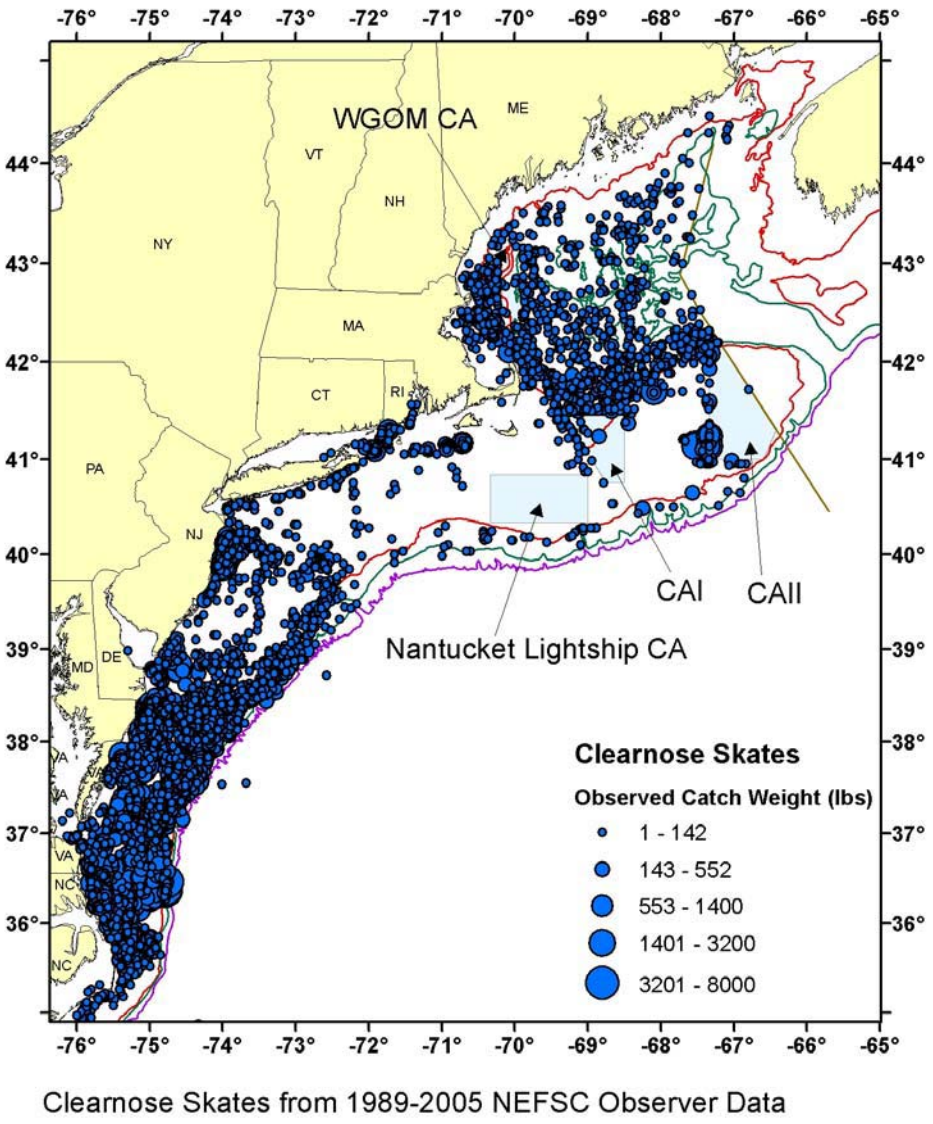
Thorny Skates from 1989-2005 NEFSC Observer Data

Figure B1.5. Distribution of thorny skates from the Observer Program, 1989-2005.



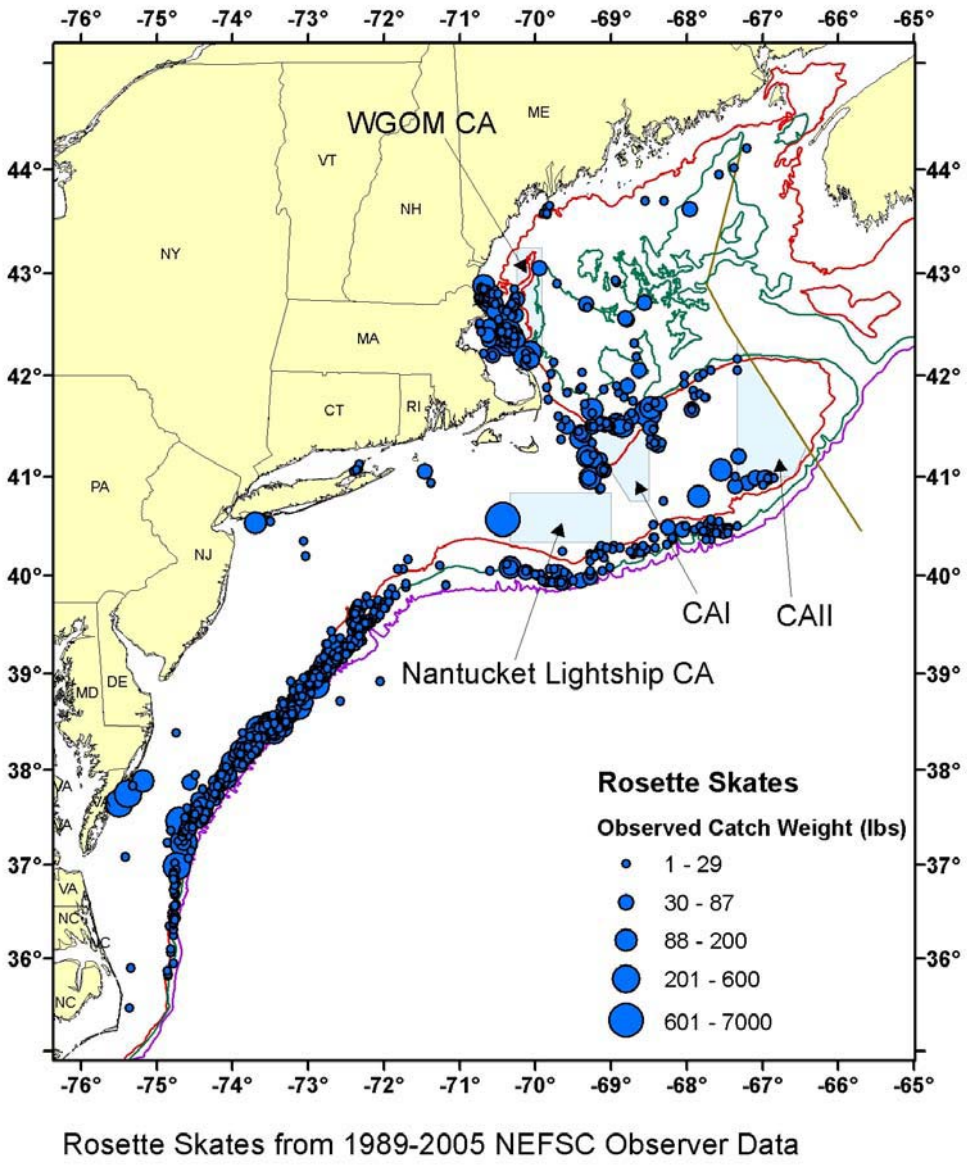
Smooth Skates from 1989-2005 NEFSC Observer Data

Figure B1.6. Distribution of smooth skates from the Observer Program, 1989-2005.



Clearnose Skates from 1989-2005 NEFSC Observer Data

Figure B1.7. Distribution of clearnose skates from the Observer Program, 1989-2005.



Rosette Skates from 1989-2005 NEFSC Observer Data

Figure B1.8. Distribution of rosette skates from the Observer Program, 1989-2005.

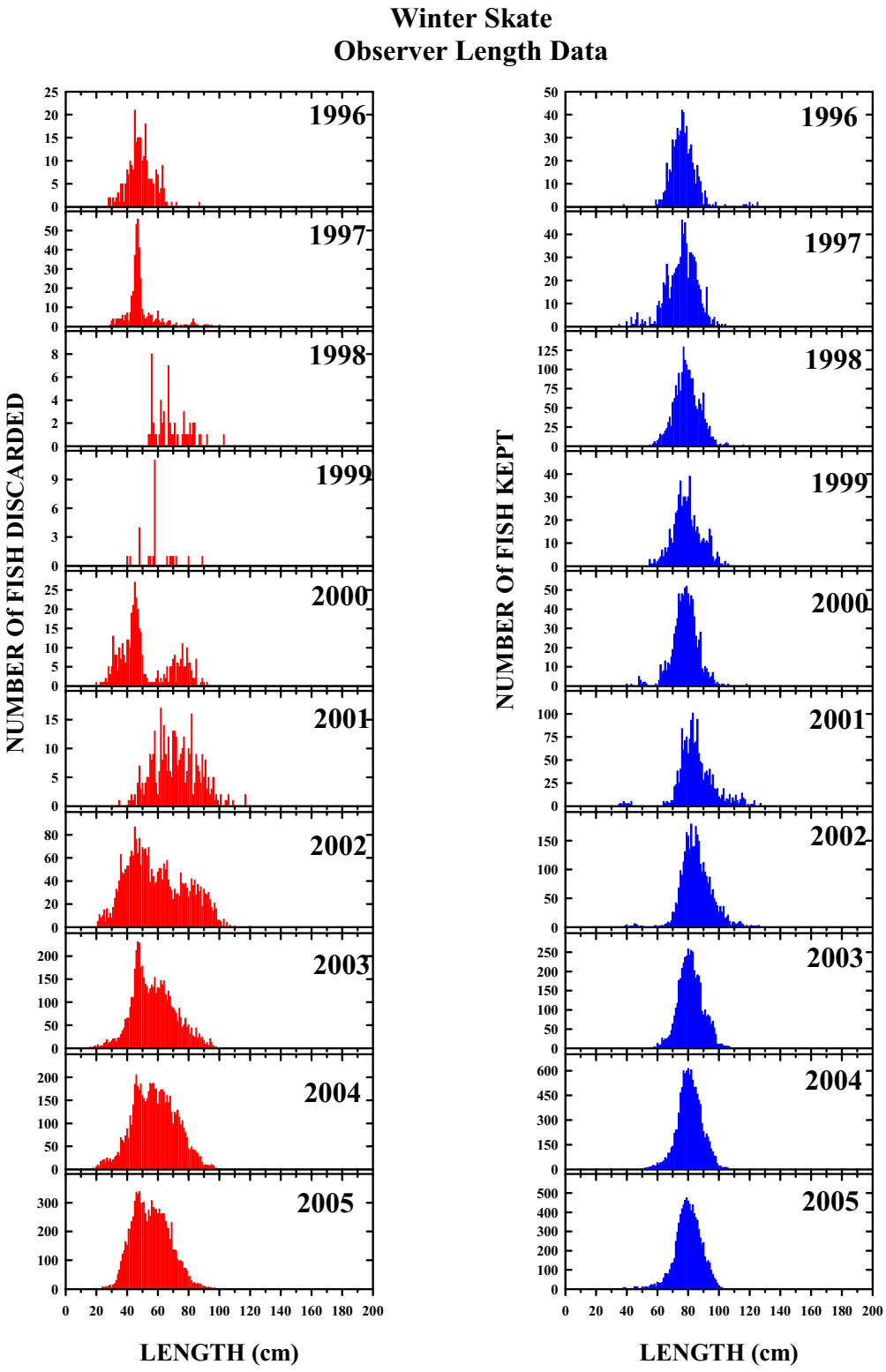


Figure B1.9. Winter skate length composition from the NEFSC observer program 1996-2005.

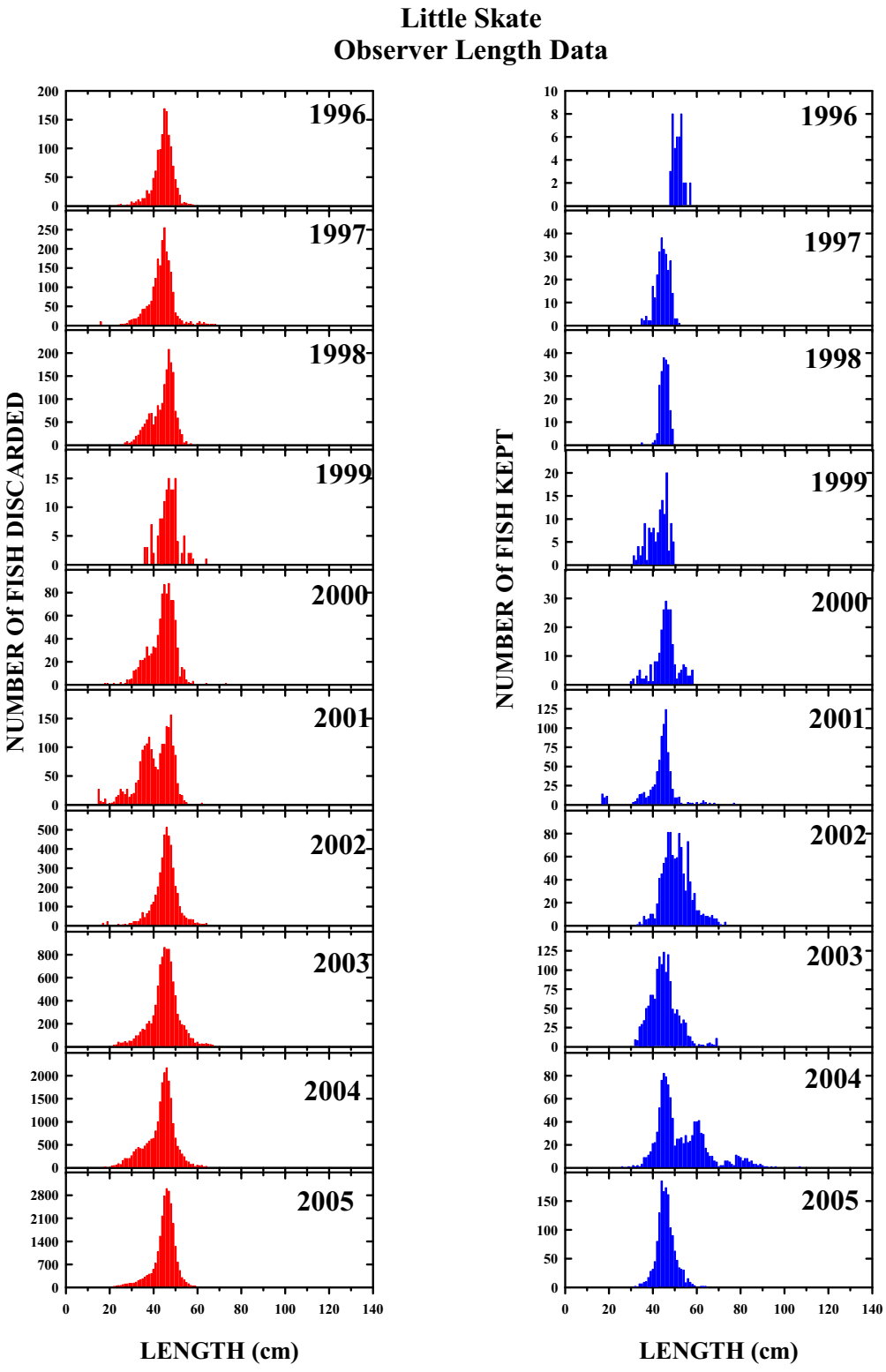


Figure B1.10. Little skate length composition from the NEFSC observer program 1996-2005.

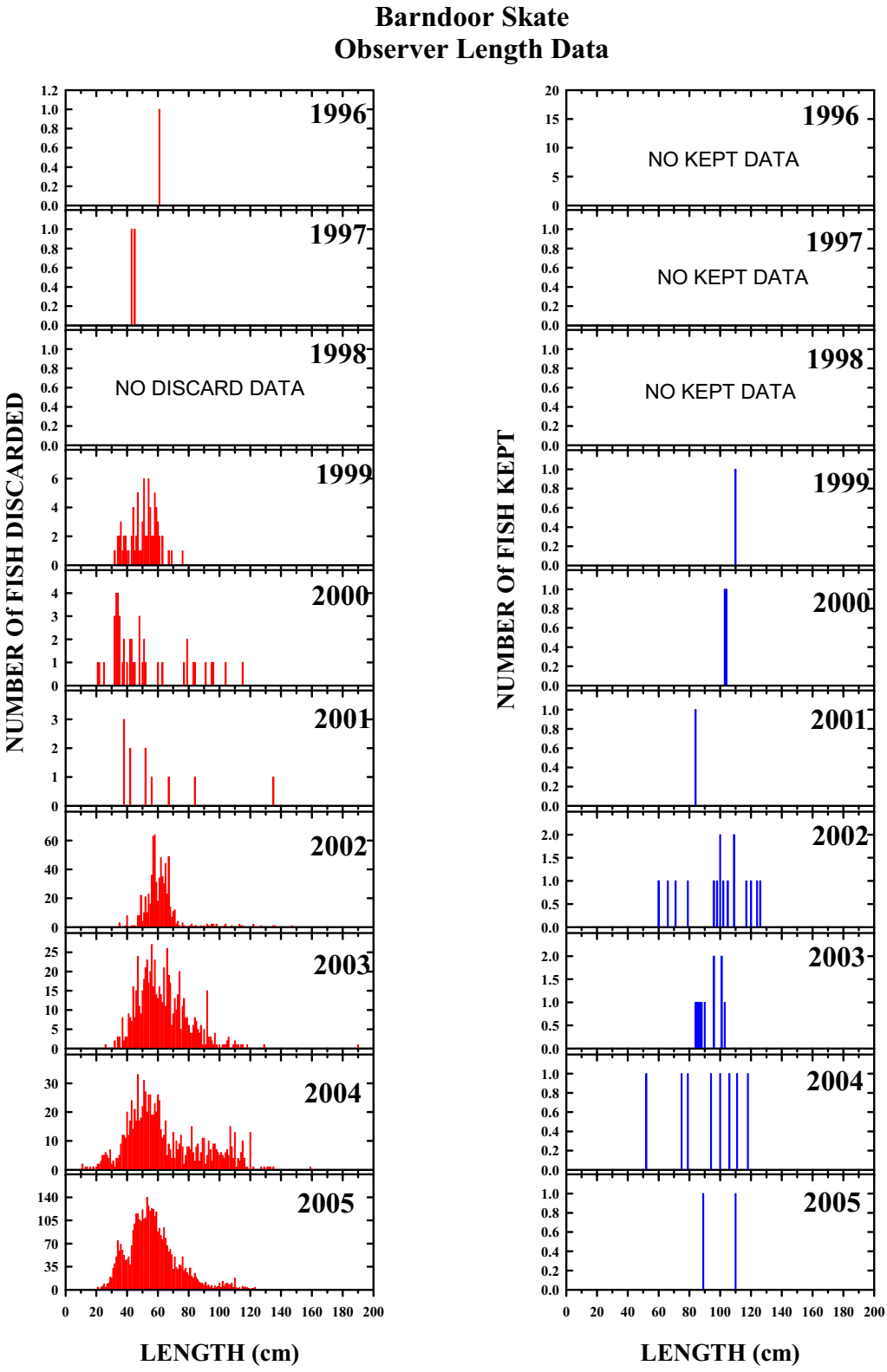


Figure B1.11. Barndoor skate length composition from the NEFSC observer program 1996-2005.

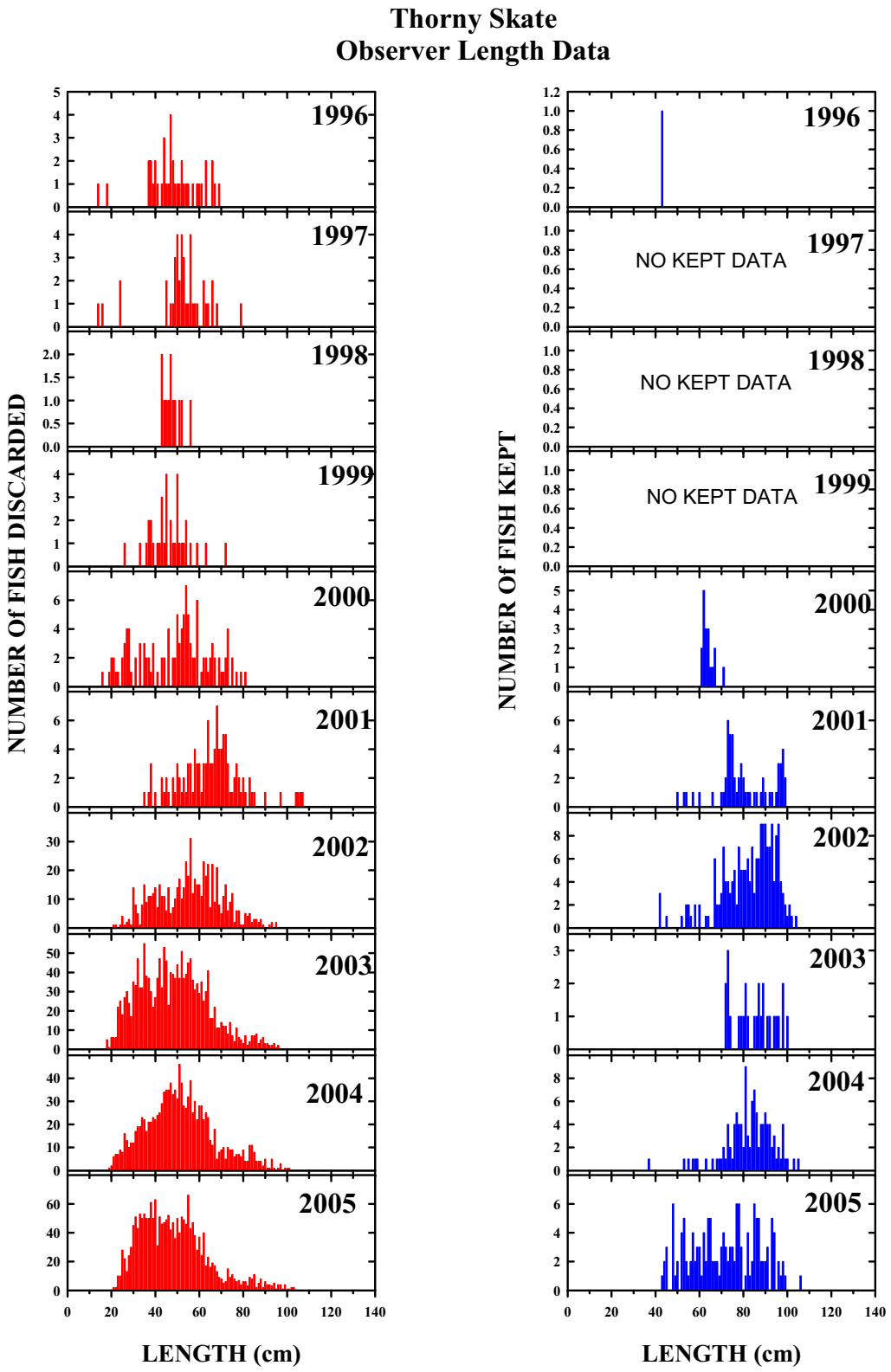


Figure B1.12. Thorny skate length composition from the NEFSC observer program 1996-2005.

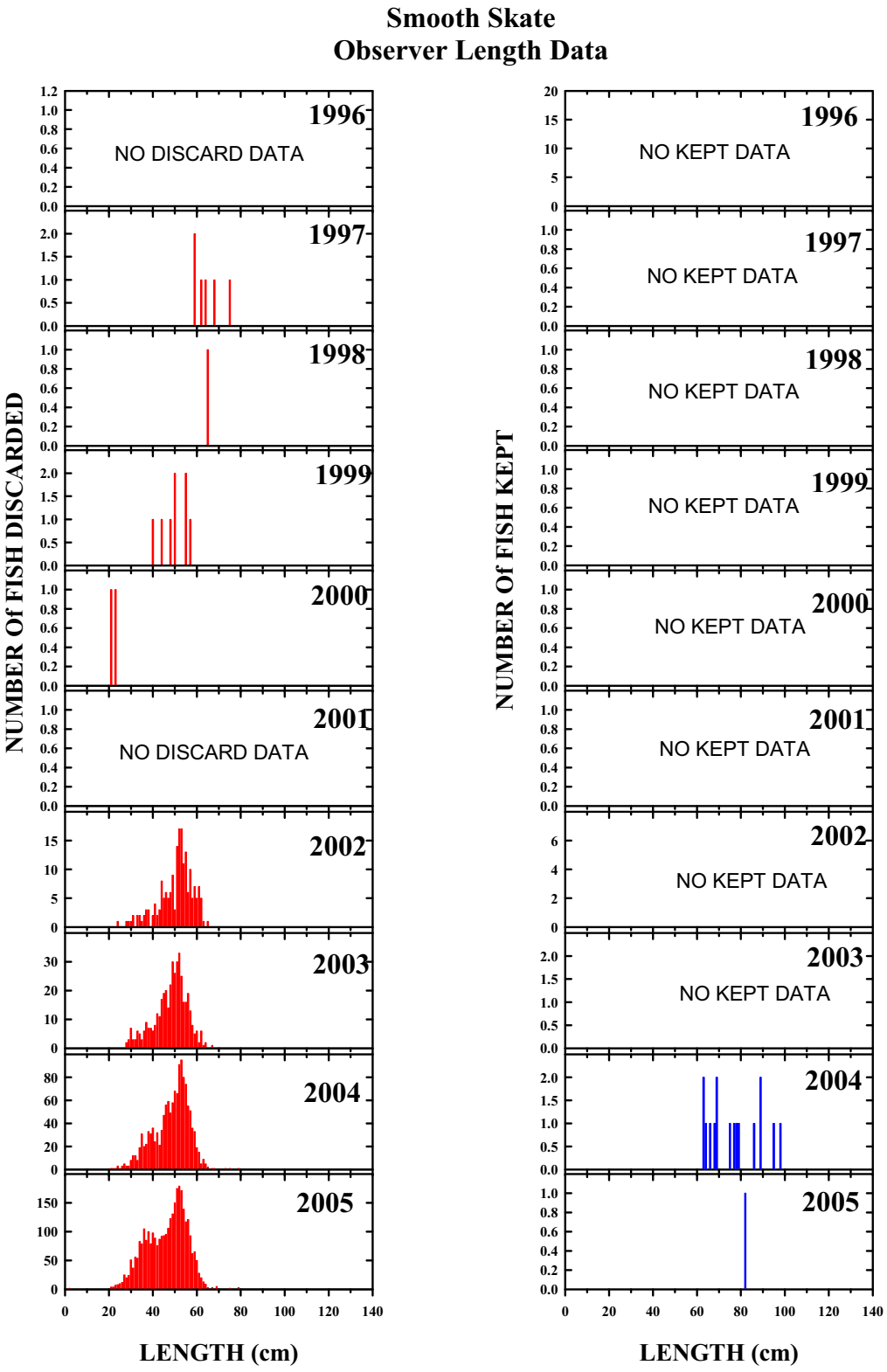


Figure B1.13. Smooth skate length composition from the NEFSC observer program 1996-2005.

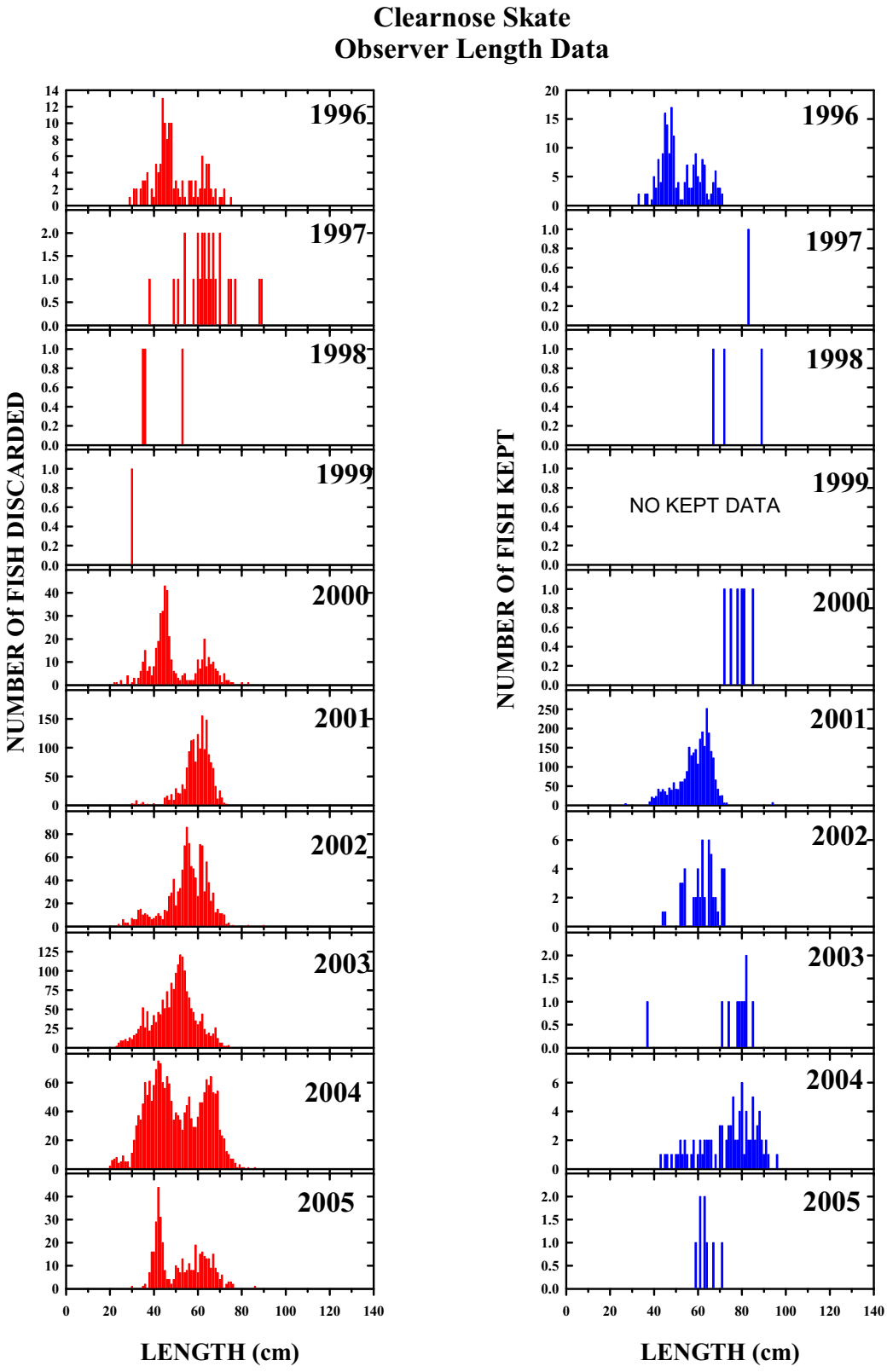


Figure B1.14. Clearnose skate length composition from the NEFSC observer program 1996-2005.

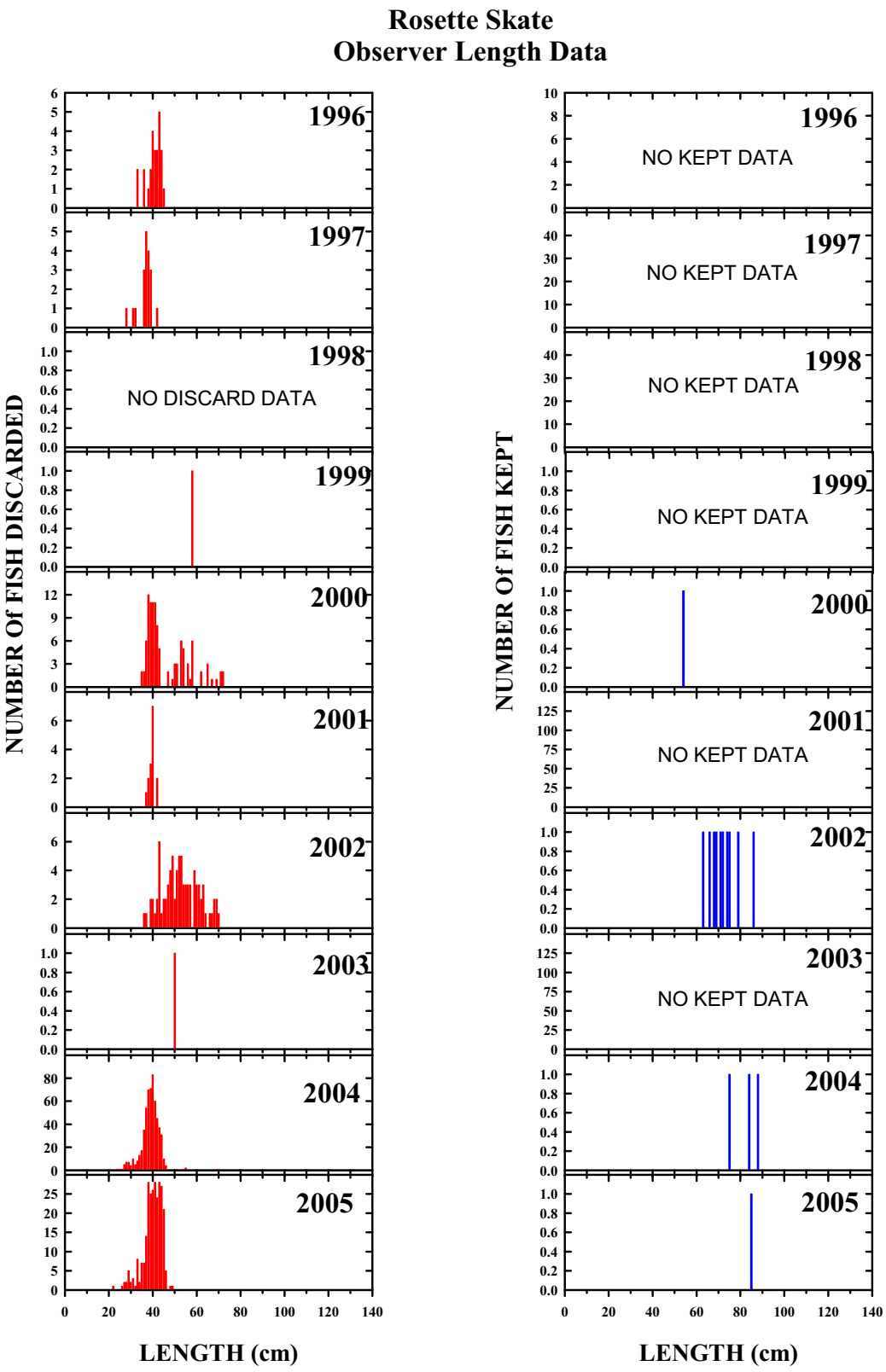


Figure B1.15. Rosette skate length composition from the NEFSC observer program 1996-2005.

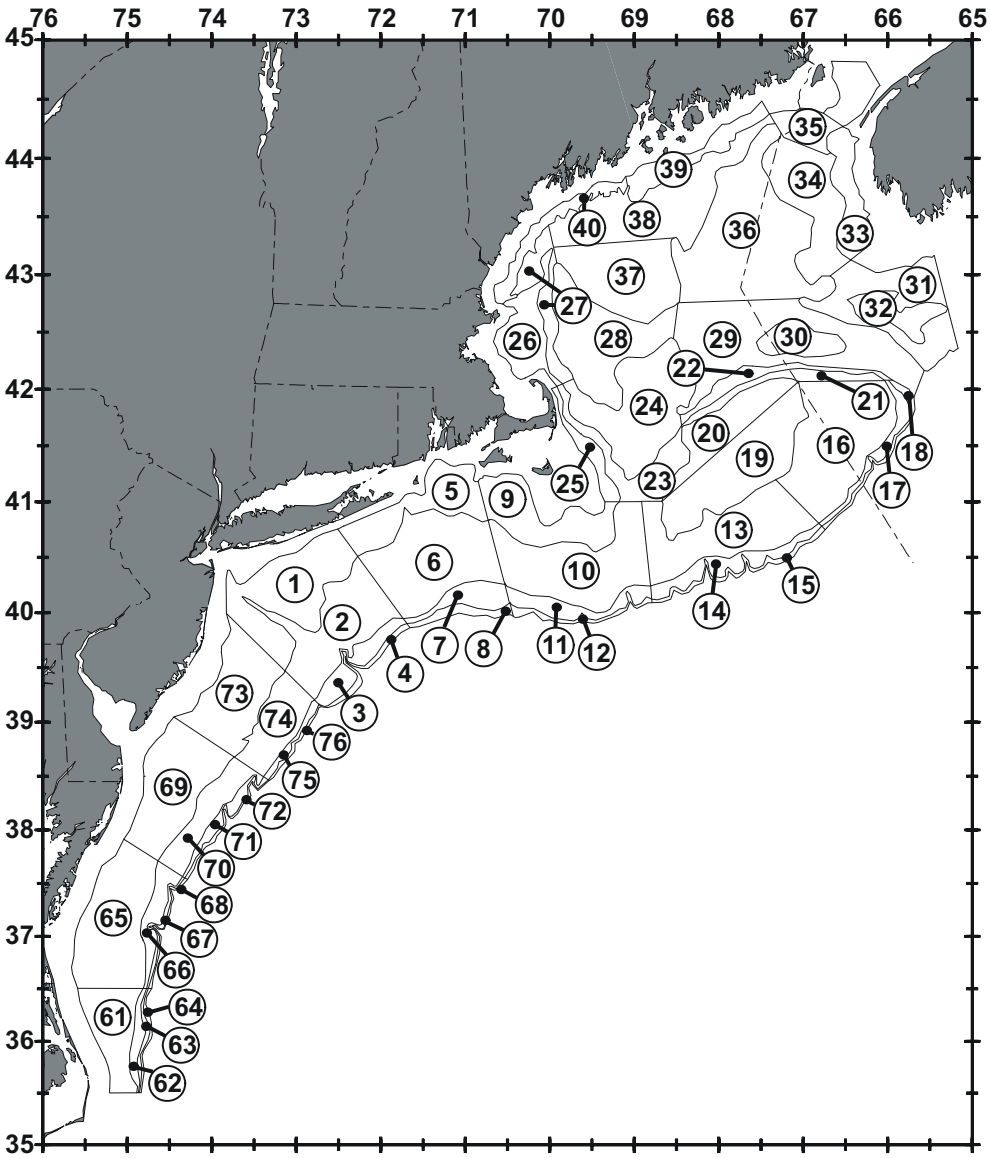


Figure B2.1. Map of offshore strata sampled in the NEFSC spring, autumn, and winter surveys.

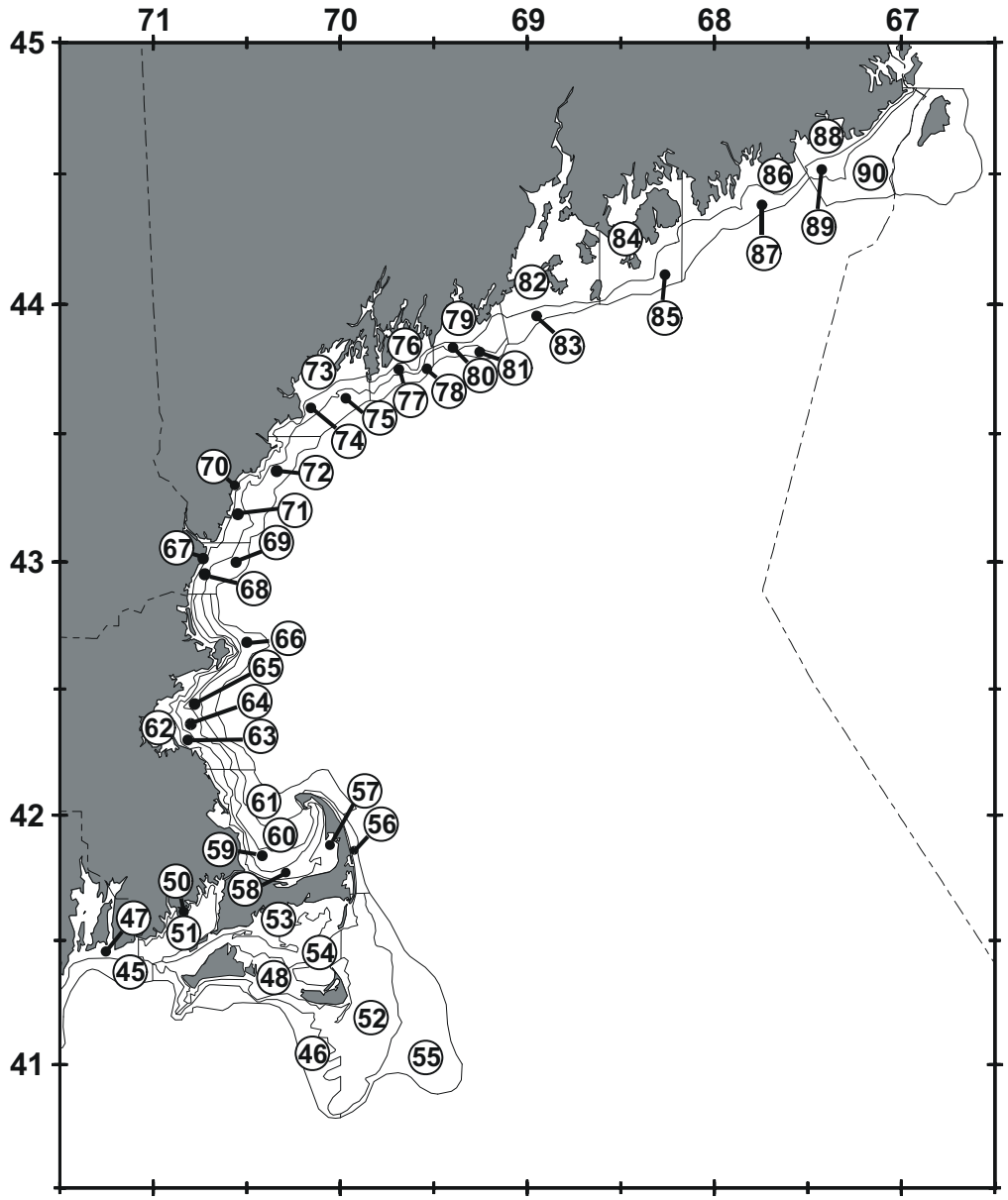


Figure B2.2. Map of inshore strata sampled in the NEFSC spring and autumn surveys in the Gulf of Maine.

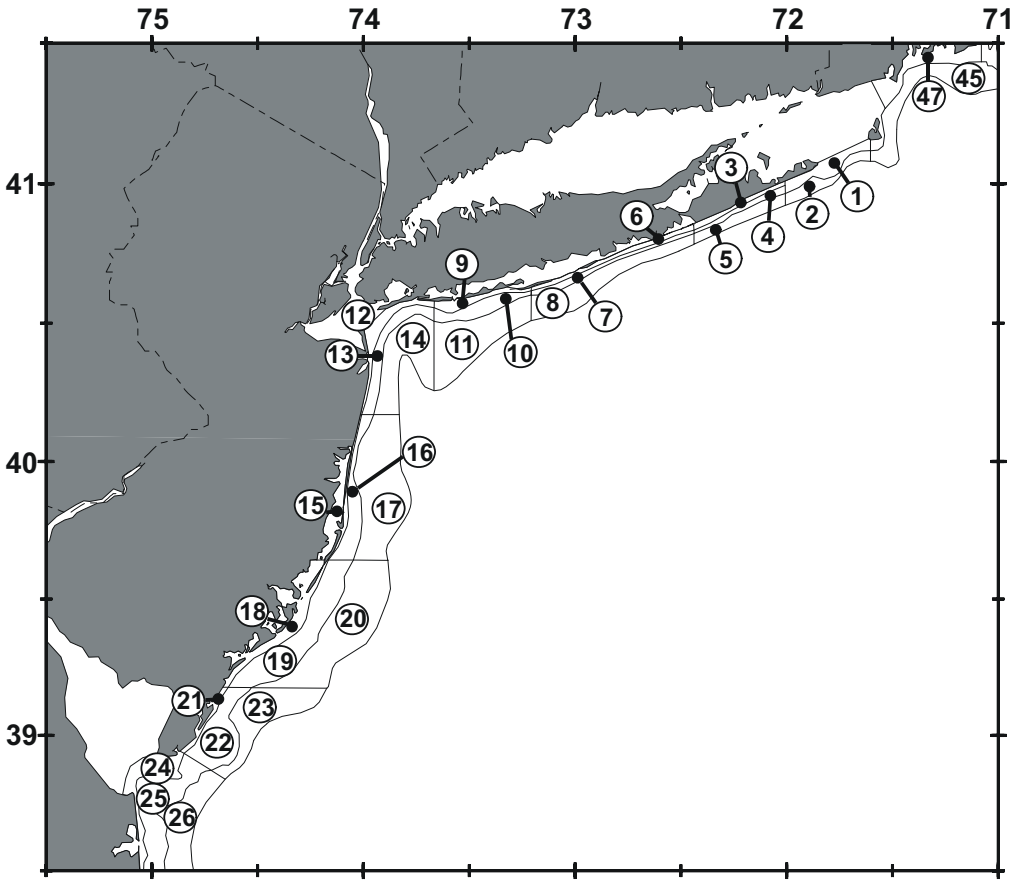


Figure B2.3. Map of inshore strata sampled in the NEFSC spring and autumn surveys in Southern New England.

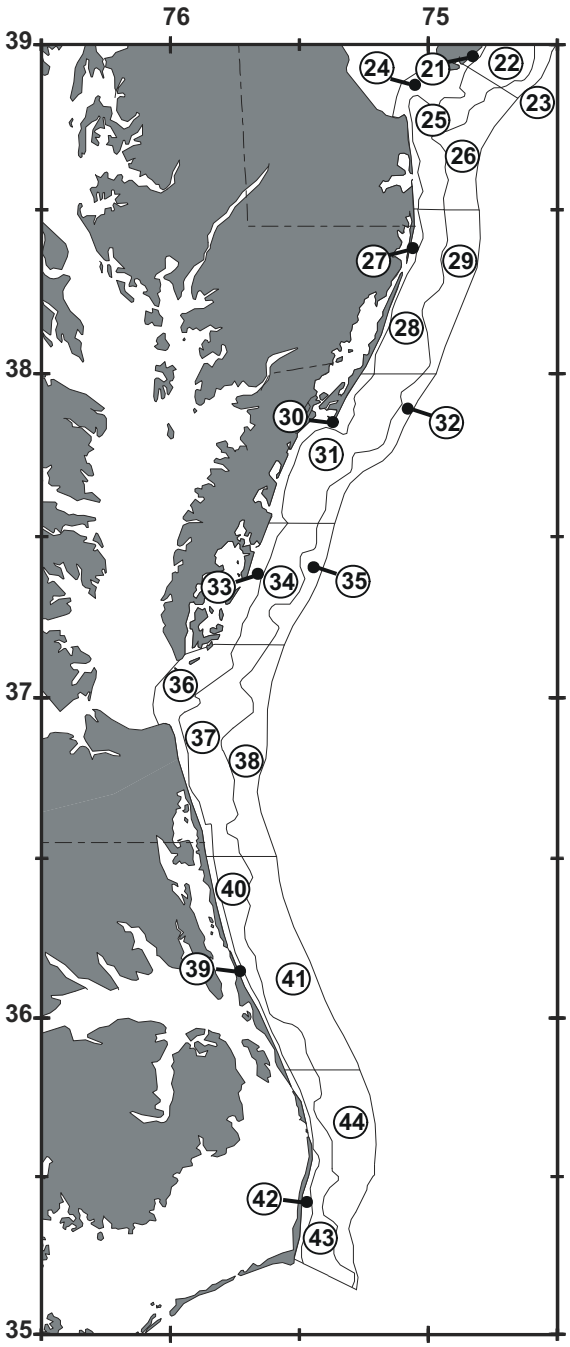


Figure B2.4. Map of inshore strata sampled in the NEFSC spring and autumn surveys in the Mid-Atlantic.

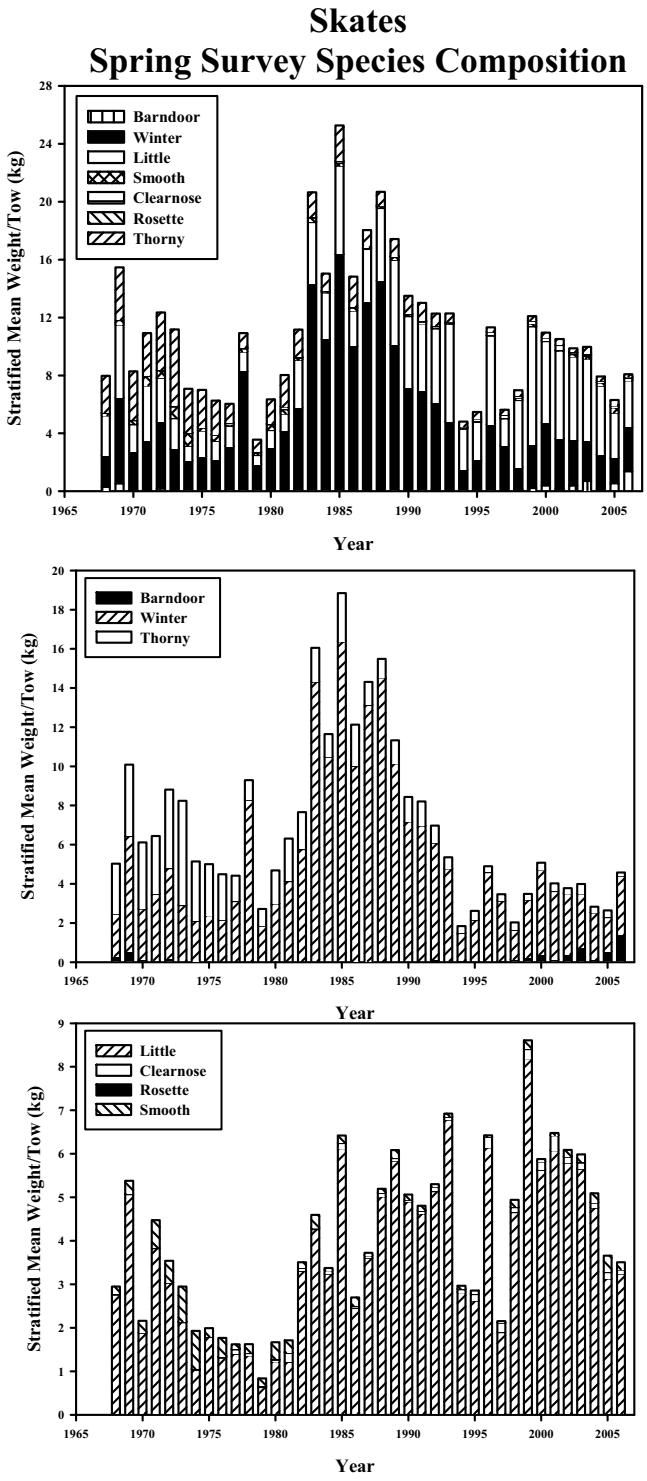


Figure B2.5. Species composition of skates from the spring survey. Panel A shows the composition of all species, panel B shows the composition of large species (>100 cm maximum length), and panel C shows the composition of the small species (maximum length < 100cm).

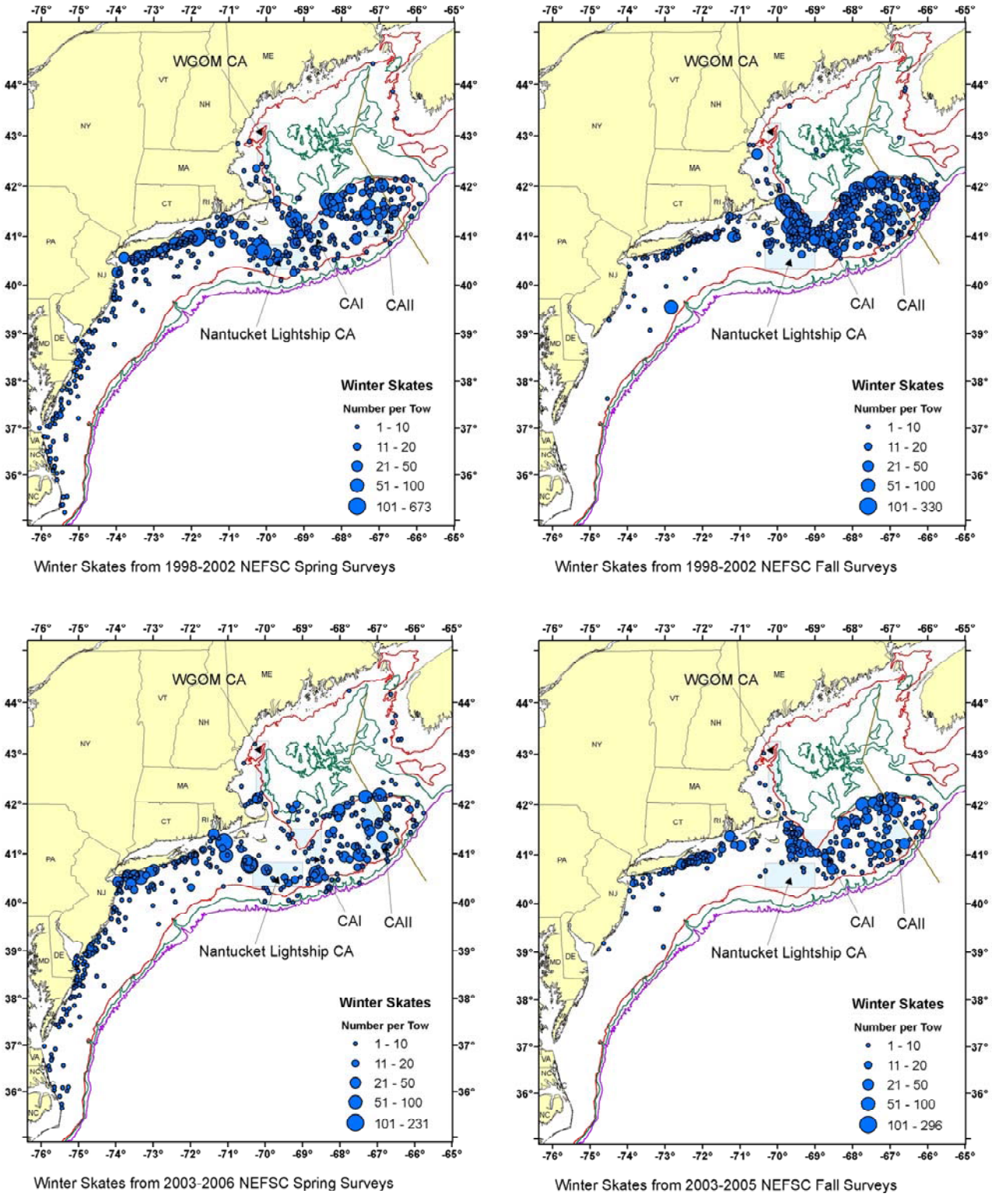
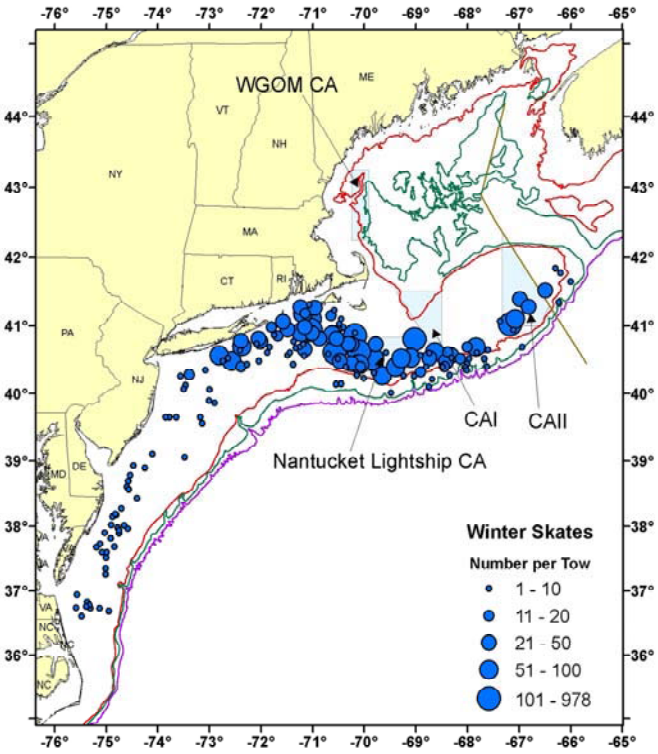
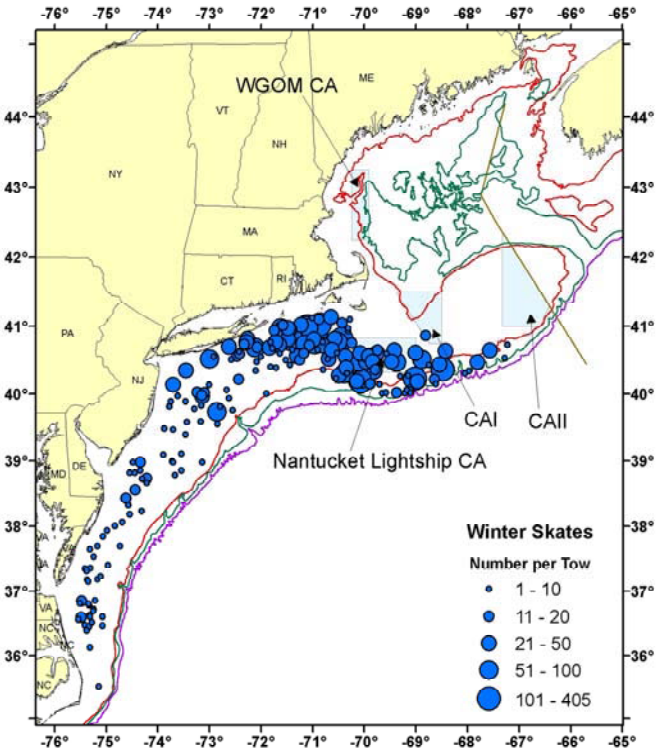


Figure B2.6. Distribution of winter skate from the spring and autumn NEFSC surveys from 1998-2006.



Winter Skates from 2000-2002 NEFSC Winter Surveys



Winter Skates from 2003-2006 NEFSC Winter Surveys

Figure B2.7. Distribution of winter skate from the NEFSC winter surveys from 2000-2006.

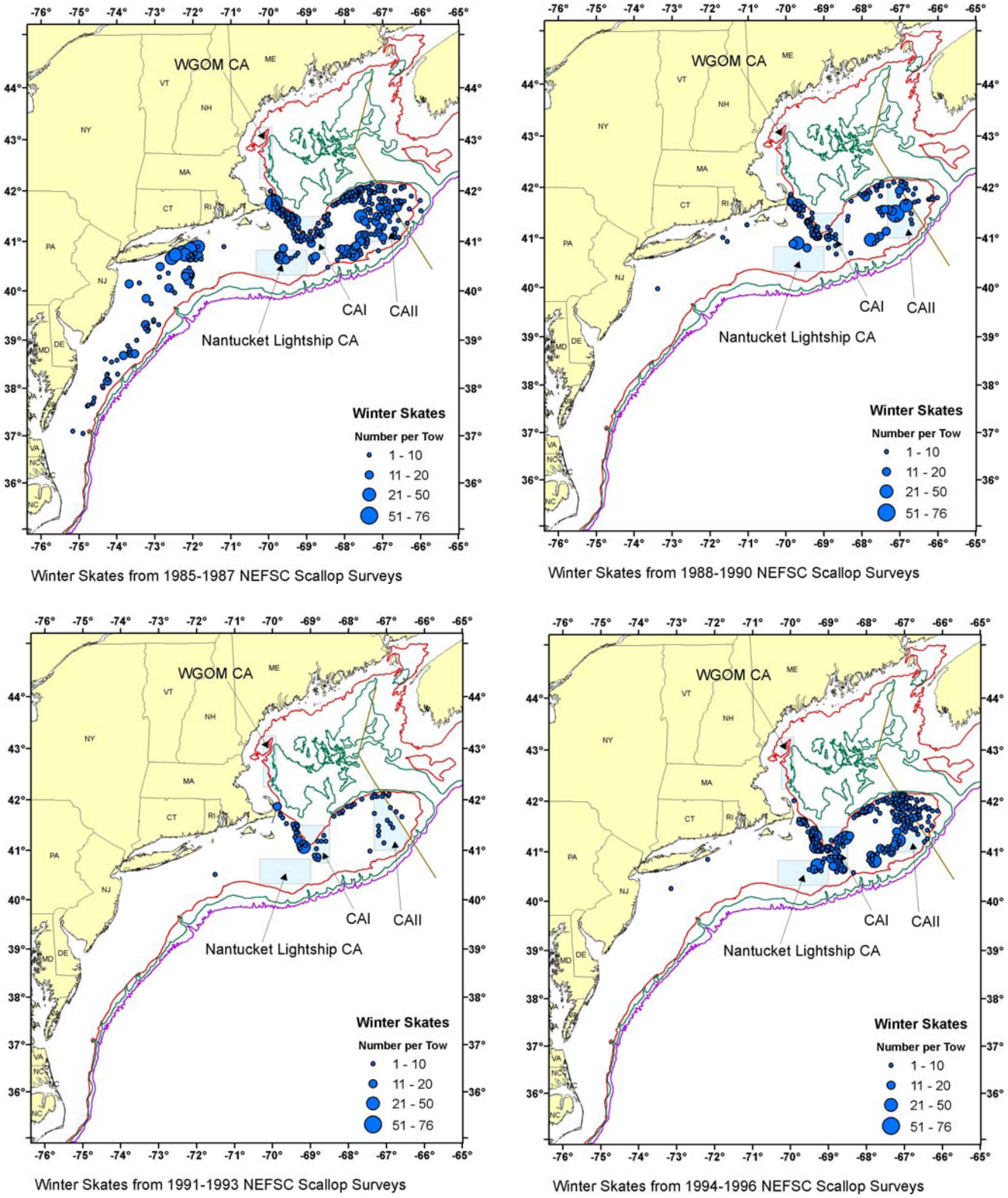
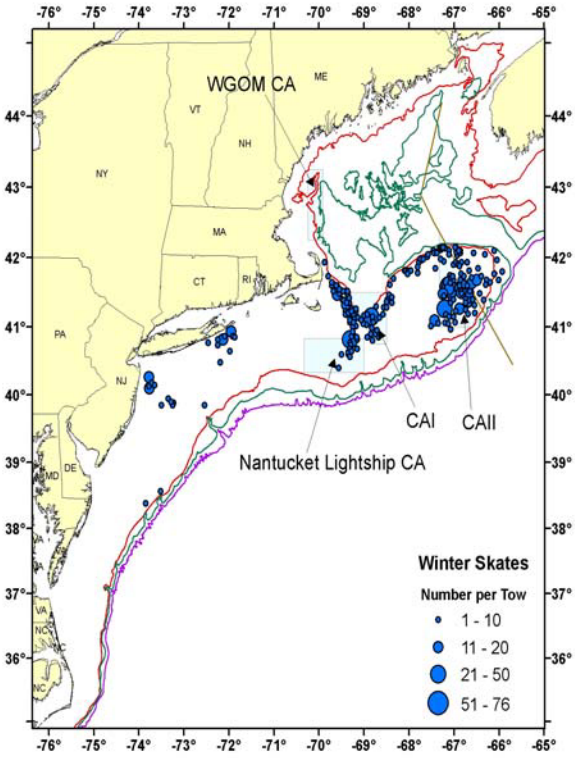
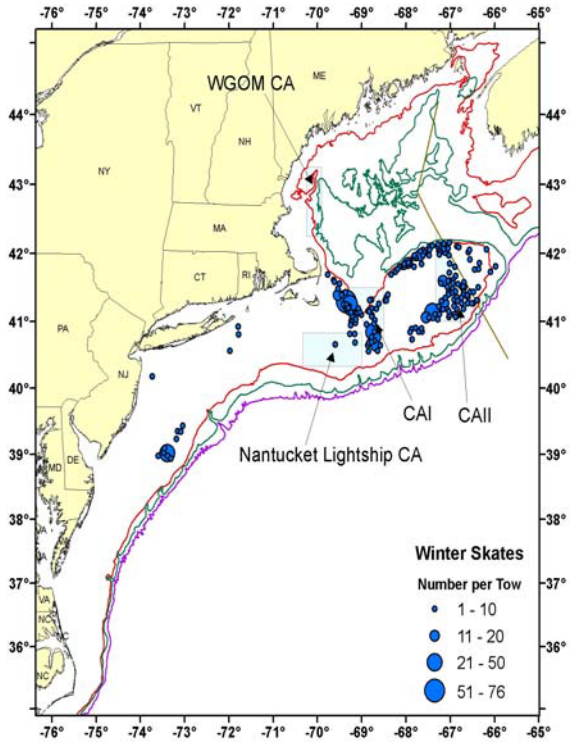


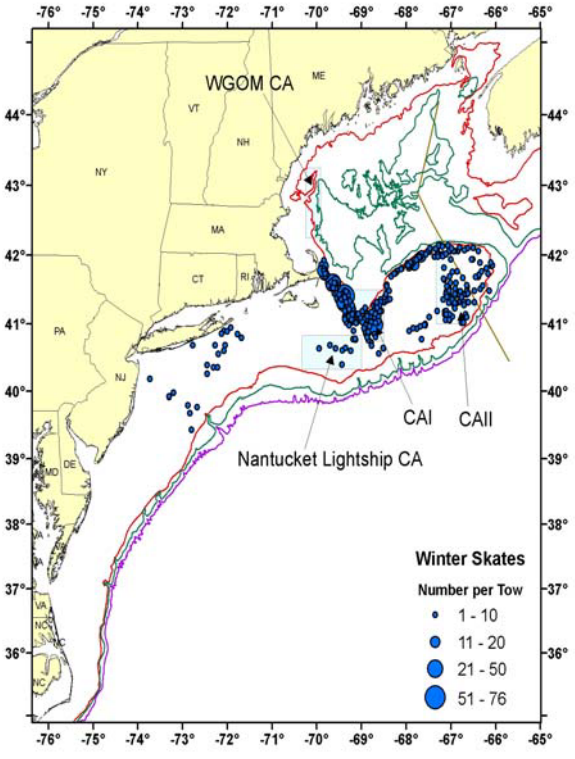
Figure B2.8. Distribution of winter skate from the NEFSC scallop surveys from 1985-1996.



Winter Skates from 1997-1999 NEFSC Scallop Surveys



Winter Skates from 2000-2002 NEFSC Scallop Surveys



Winter Skates from 2003-2006 NEFSC Scallop Surveys

Figure B2.9. Distribution of winter skate from the NEFSC scallop surveys from 1997-2006.

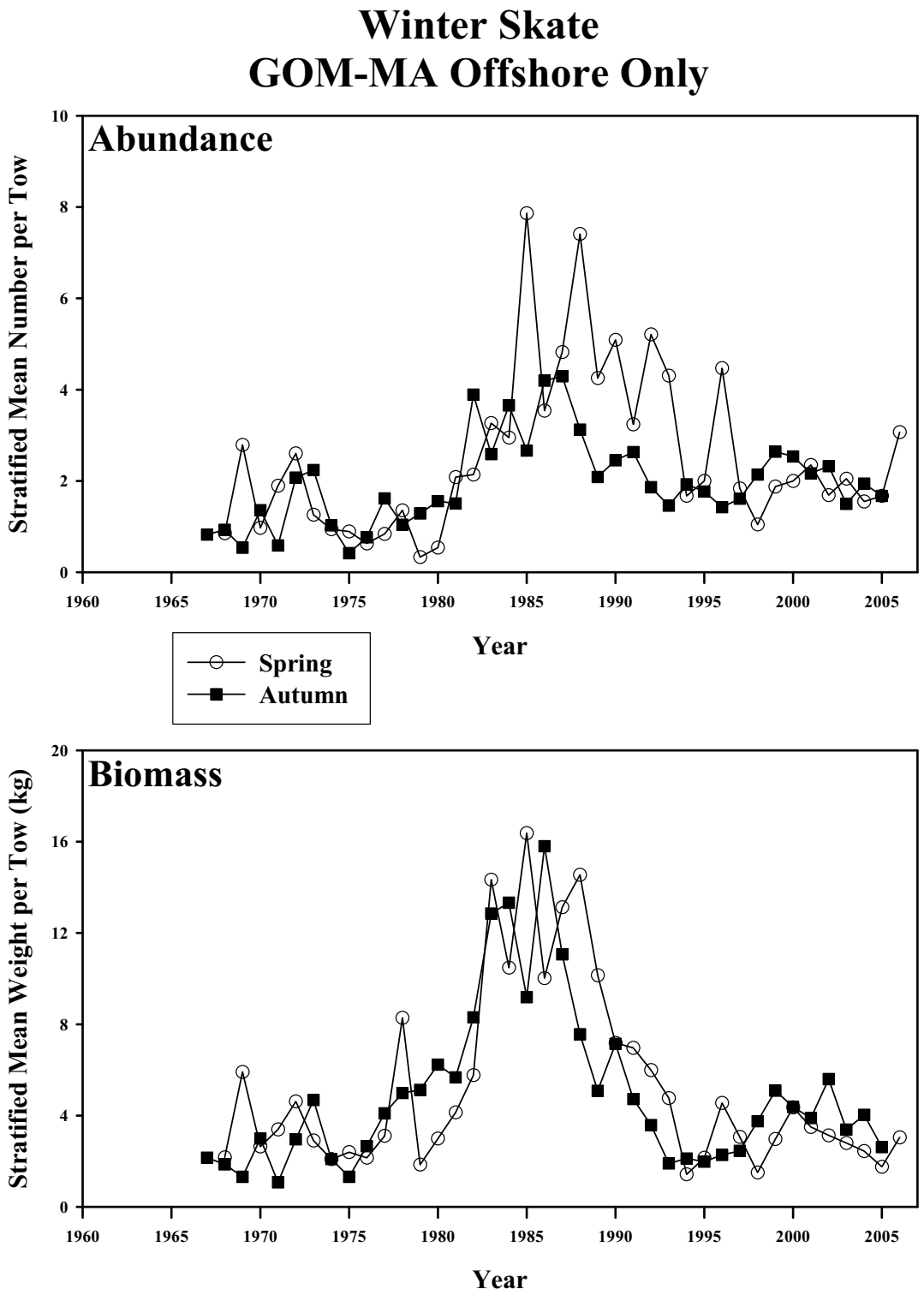


Figure B2.10. Abundance and biomass of winter skate from the NESFC spring (circles) and autumn (squares) bottom trawl surveys from 1967-2006 in the Gulf of Maine to Mid-Atlantic offshore region.

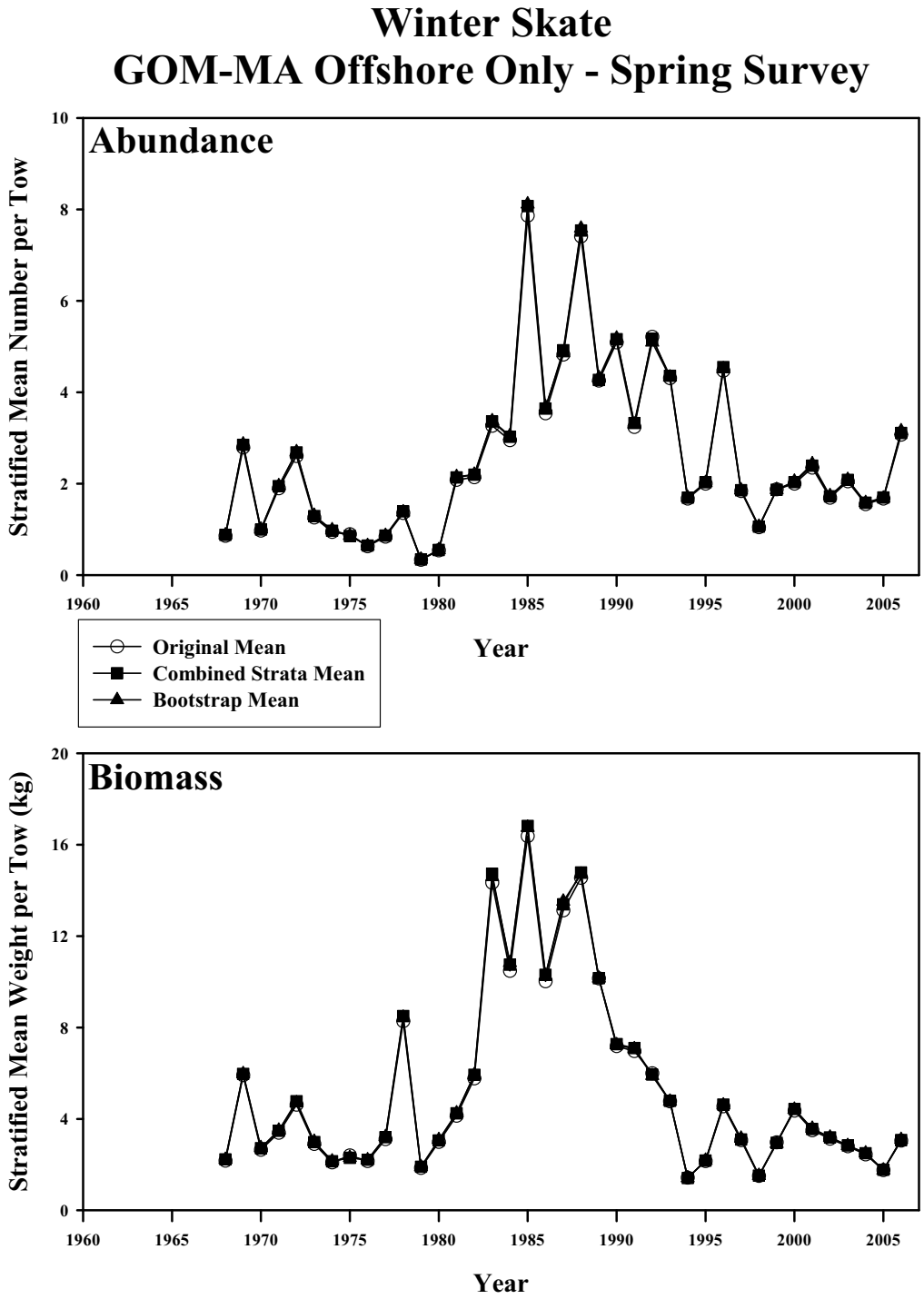


Figure B2.11. Abundance and biomass of winter skate from the NESFC spring bottom trawl surveys from 1968-2006 in the Gulf of Maine to Mid-Atlantic offshore region. The circles represent the original stratified mean, the squares represent the mean combining strata for bootstrapping, and the triangles represent the bootstrapped mean.

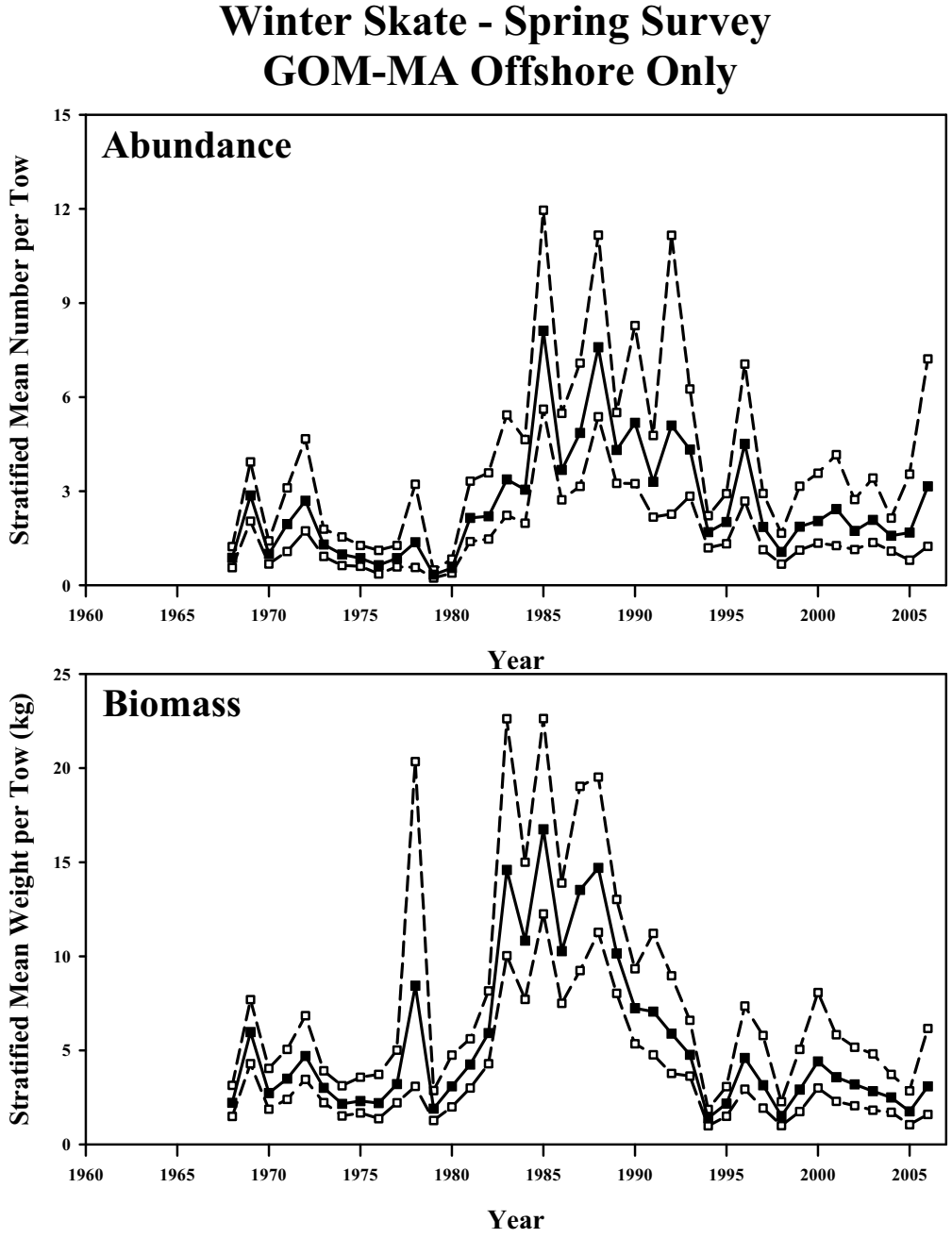


Figure B2.12. Bootstrapped abundance and biomass of winter skate from the NESFC spring bottom trawl survey in the Gulf of Maine to Mid-Atlantic region, offshore strata only. Mean index in solid squares, 95% confidence interval in open squares.

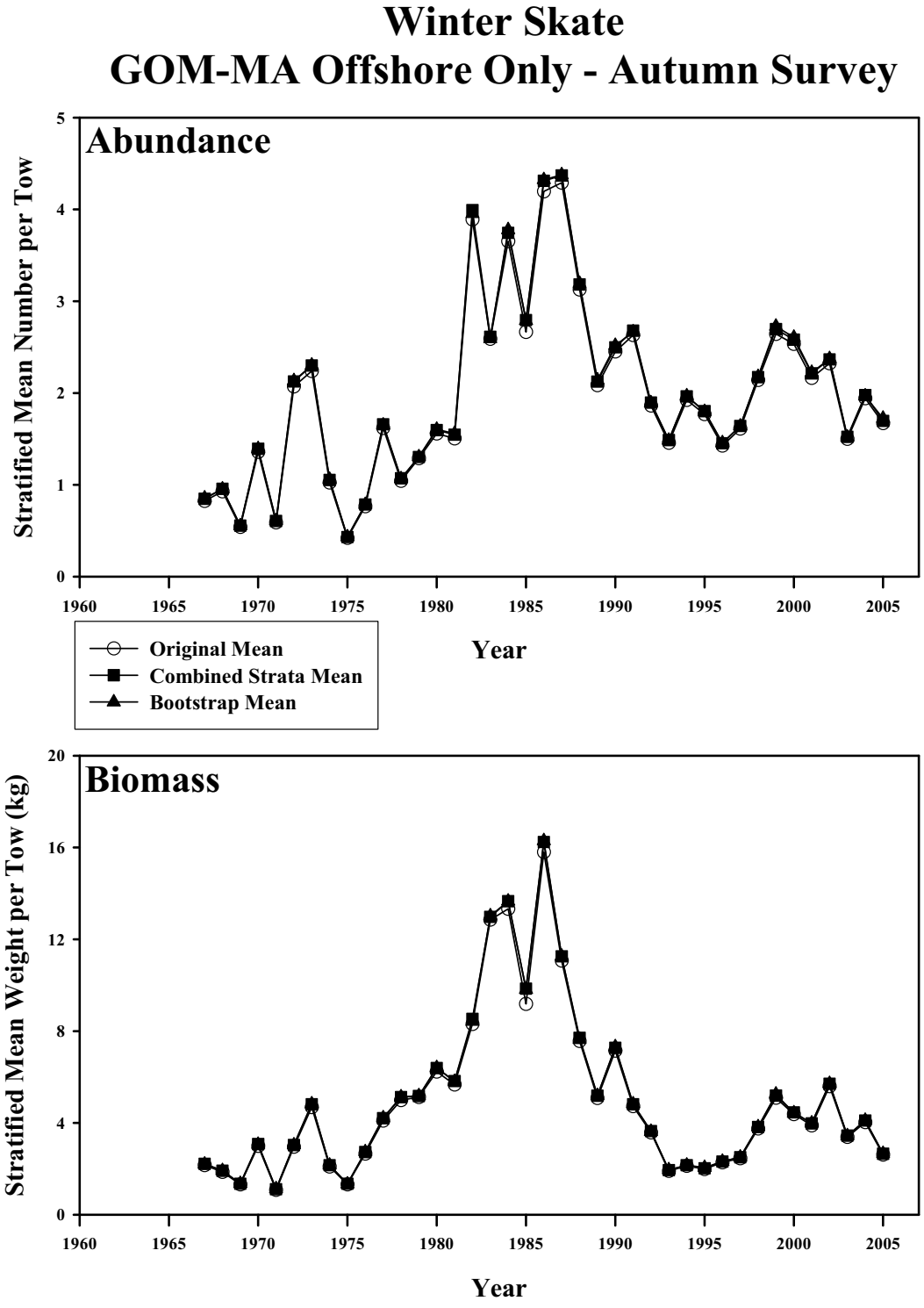


Figure B2.13. Abundance and biomass of winter skate from the NESFC autumn bottom trawl surveys from 1967-2005 in the Gulf of Maine to Mid-Atlantic offshore region. The circles represent the original stratified mean, the squares represent the mean combining strata for bootstrapping, and the triangles represent the bootstrapped mean.

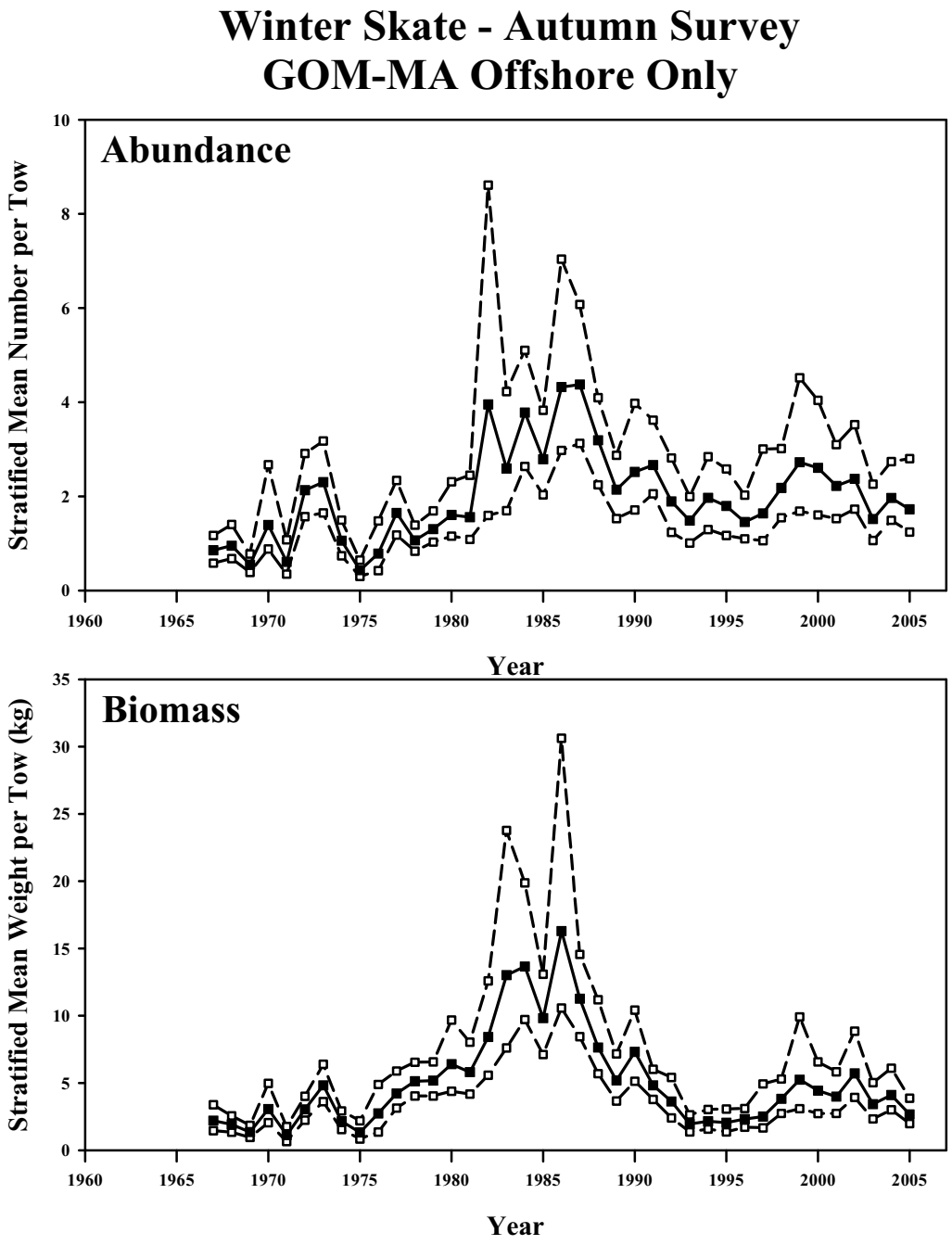


Figure B2.14. Bootstrapped abundance and biomass of winter skate from the NESFC autumn bottom trawl survey in the Gulf of Maine to Mid-Atlantic region, offshore strata only. Mean index in solid squares, 95% confidence interval in open squares.

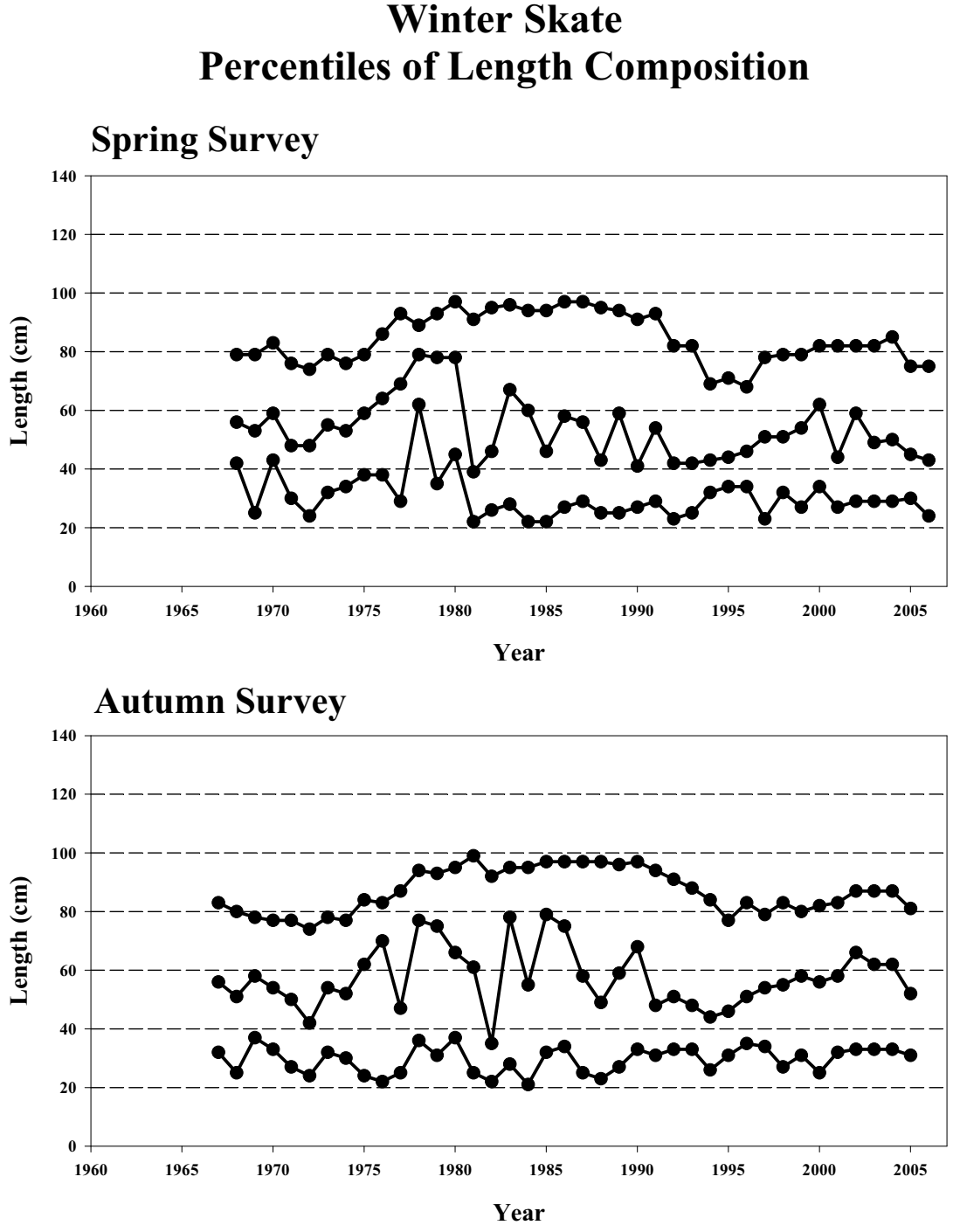


Figure B2.15. Percentiles of length composition (5, 50, and 95) of winter skate from the NESFC spring and autumn bottom trawl surveys from 1967-2006 in the Gulf of Maine to Mid-Atlantic offshore region.

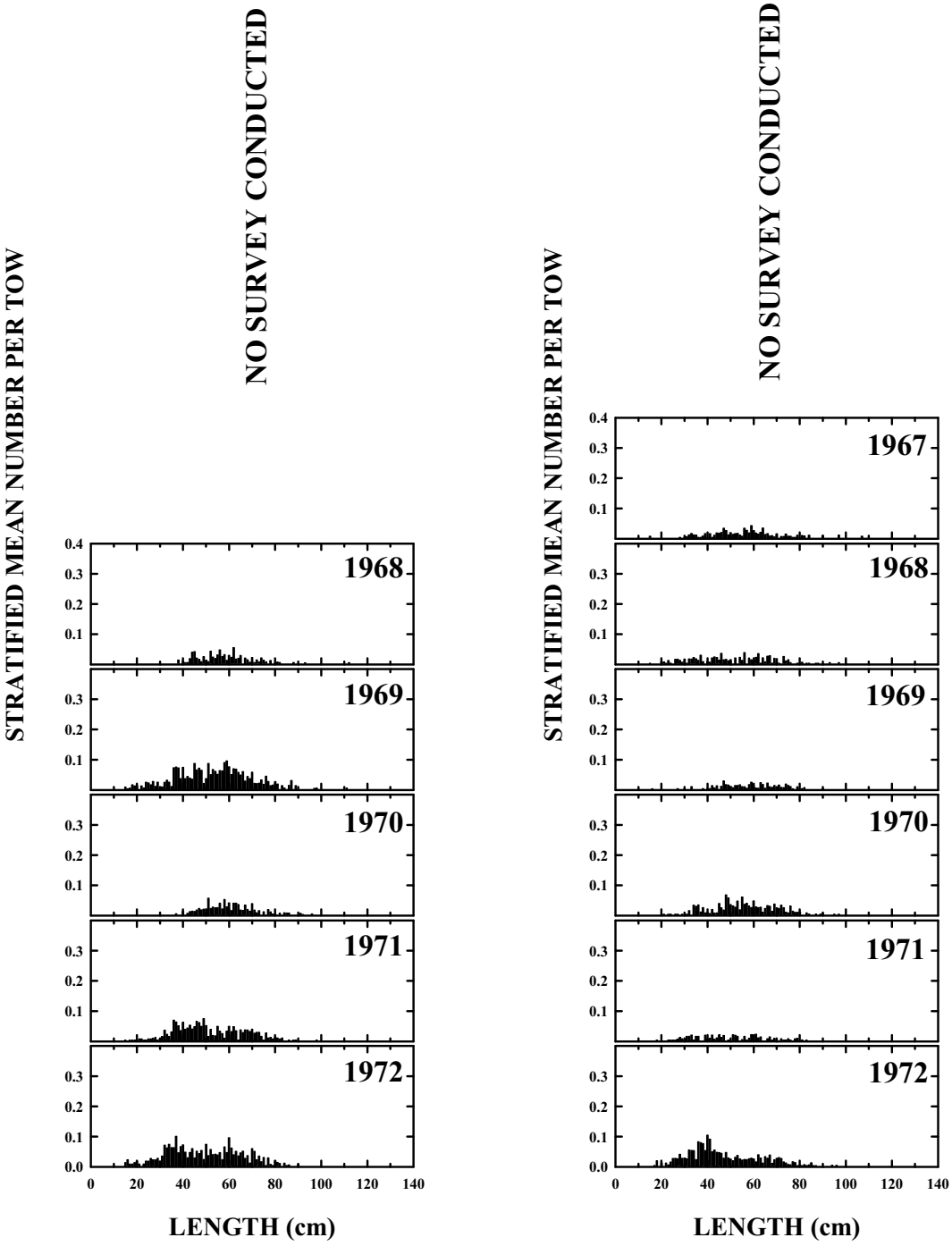


Figure B2.16. Winter skate length composition from the NEFSC spring and autumn trawl surveys in the Gulf of Maine to Mid-Atlantic offshore regions, 1967-1972.

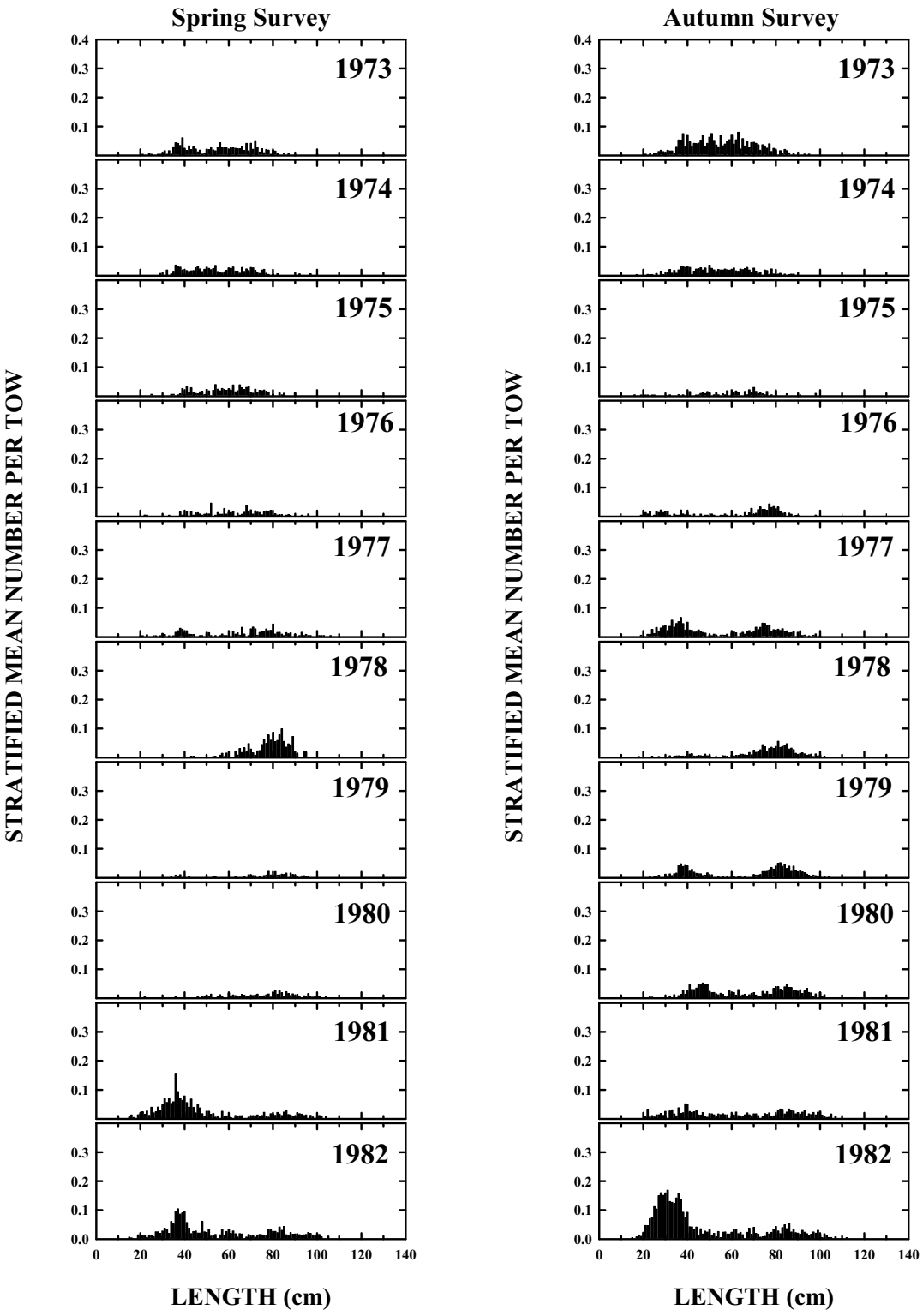


Figure B2.17. Winter skate length composition from the NEFSC spring and autumn bottom trawl surveys in the Gulf of Maine to Mid-Atlantic offshore regions, 1973-1982.

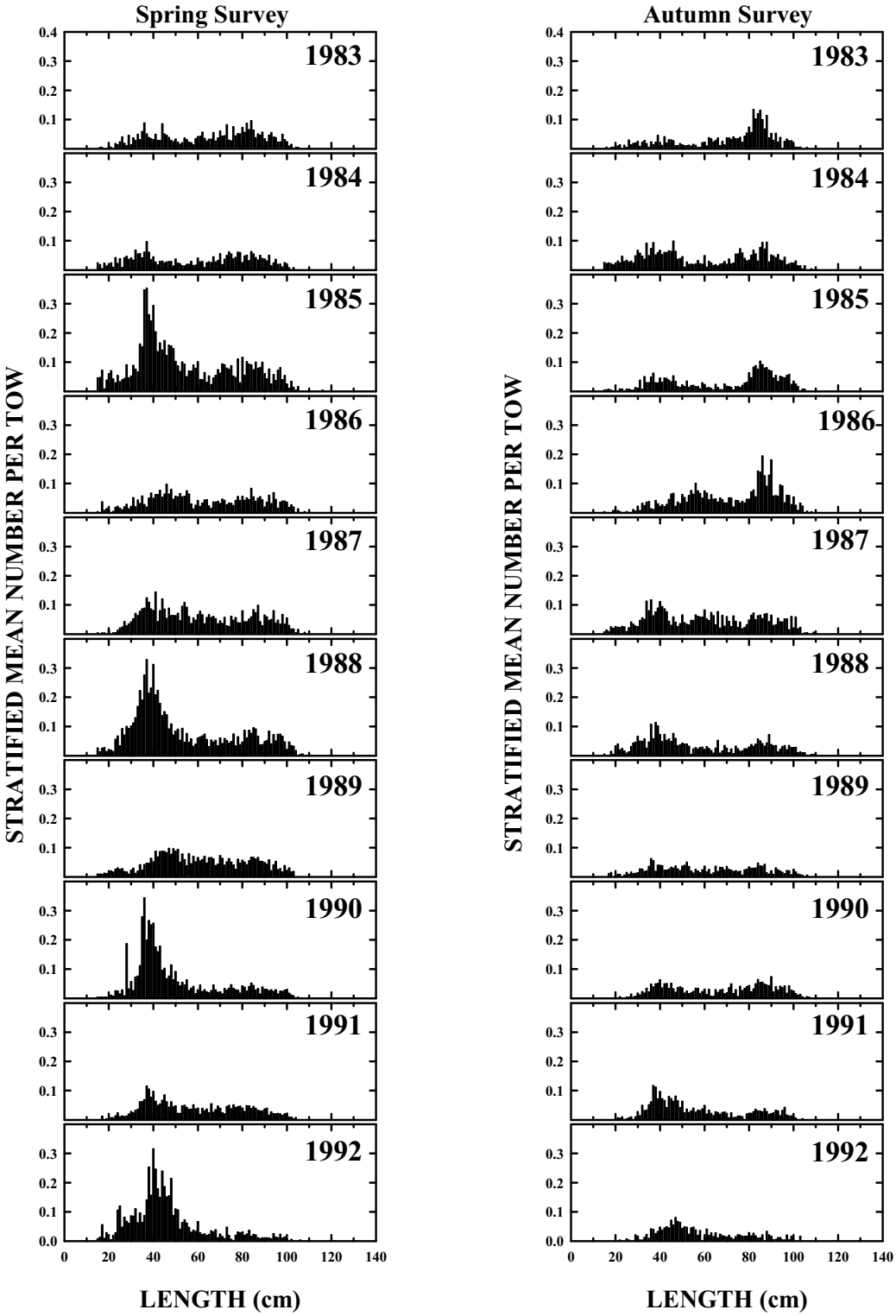


Figure B2.18. Winter skate length composition from the NEFSC spring and autumn bottom trawl surveys in the Gulf of Maine to Mid-Atlantic offshore regions, 1983-1992.

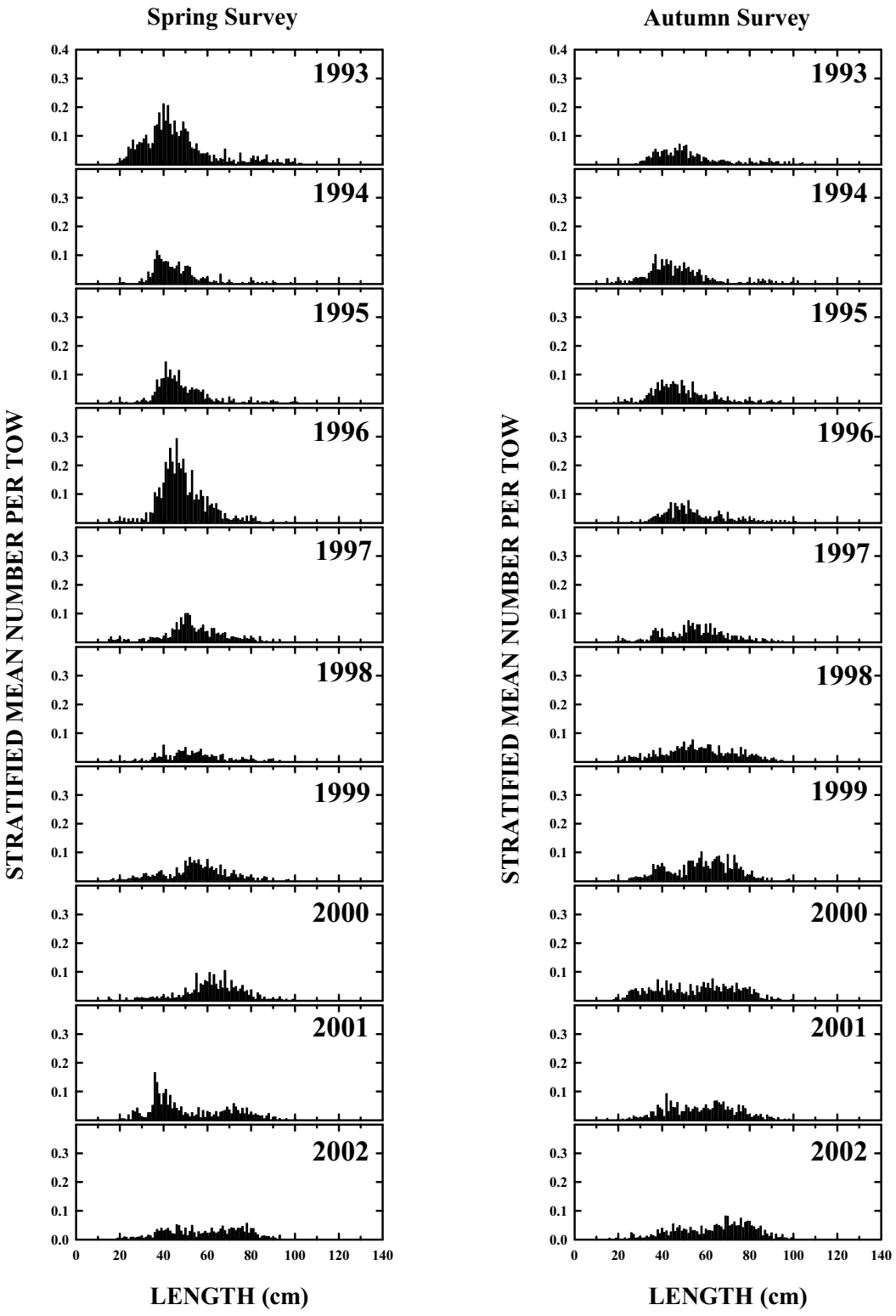


Figure B2.19. Winter skate length composition from the NEFSC spring and autumn bottom trawl surveys in the Gulf of Maine to Mid-Atlantic offshore regions, 1993-2002.

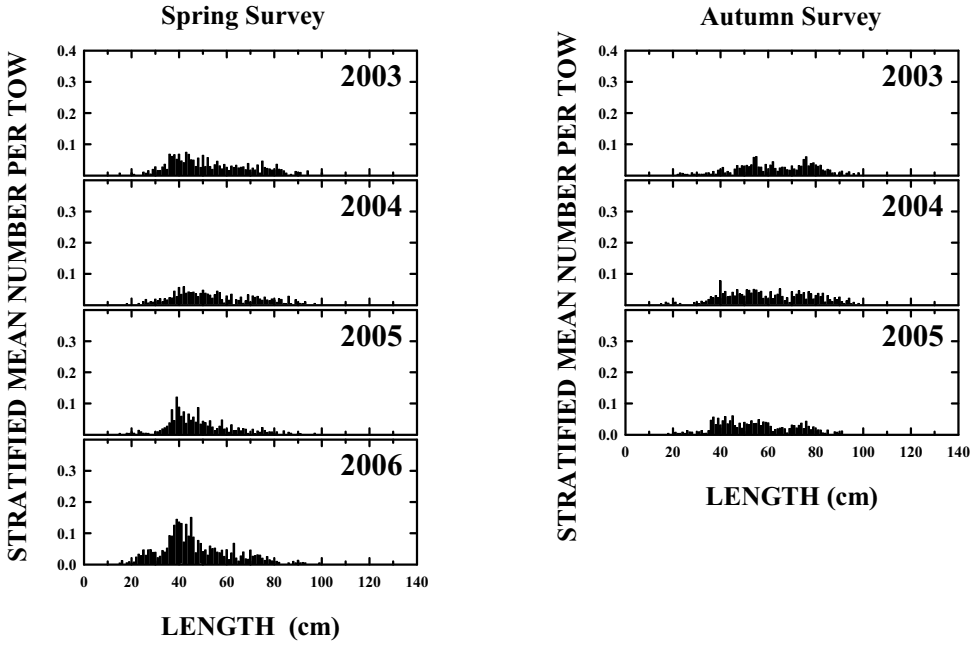


Figure B2.20. Winter skate length composition from the NEFSC spring and autumn bottom trawl surveys in the Gulf of Maine to Mid-Atlantic offshore regions, 2003-2006.

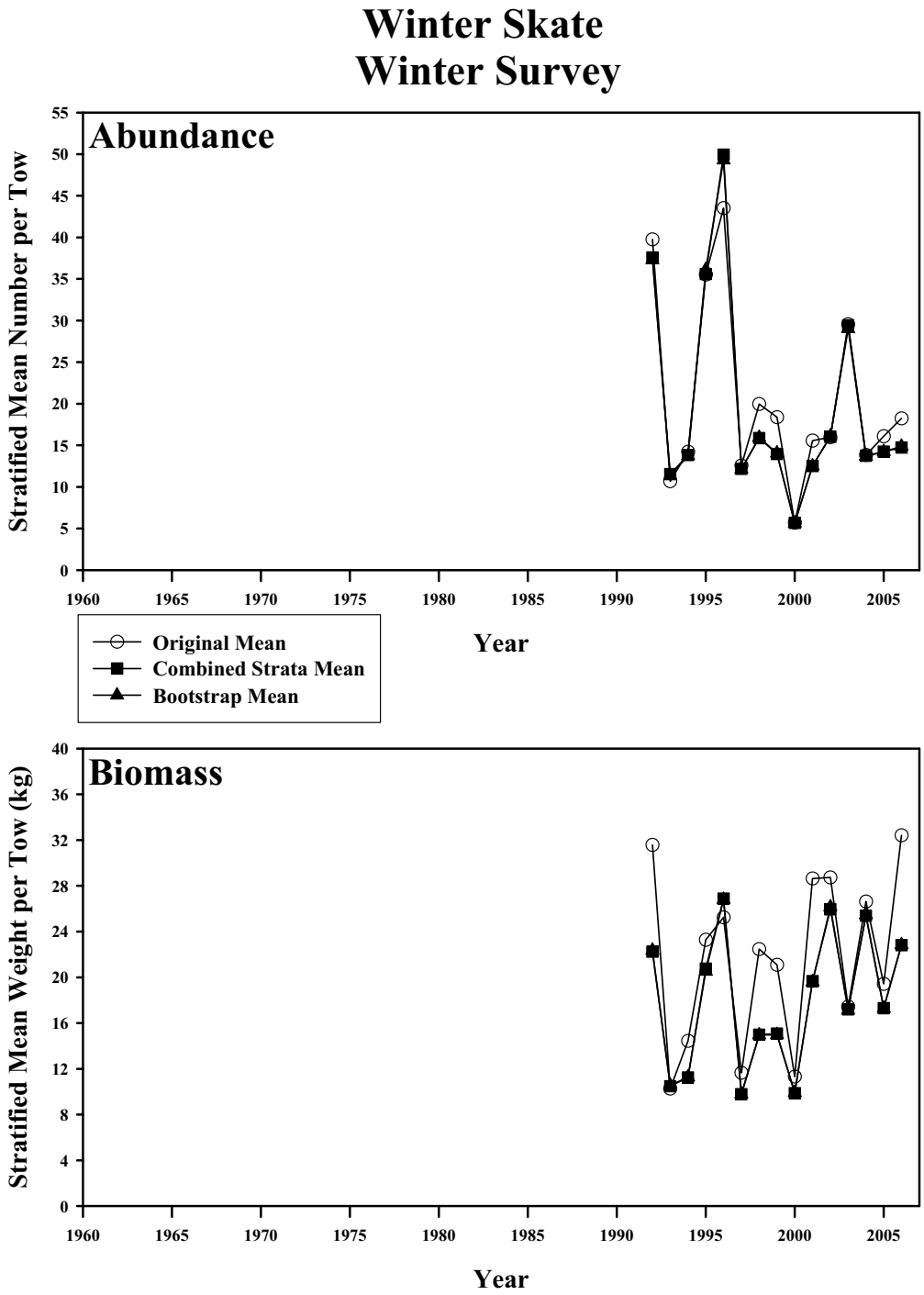


Figure B2.21. Abundance and biomass of winter skate from the NESFC winter bottom trawl surveys from 1992-2006. The circles represent the original stratified mean, the squares represent the mean combining strata for bootstrapping, and the triangles represent the bootstrapped mean.

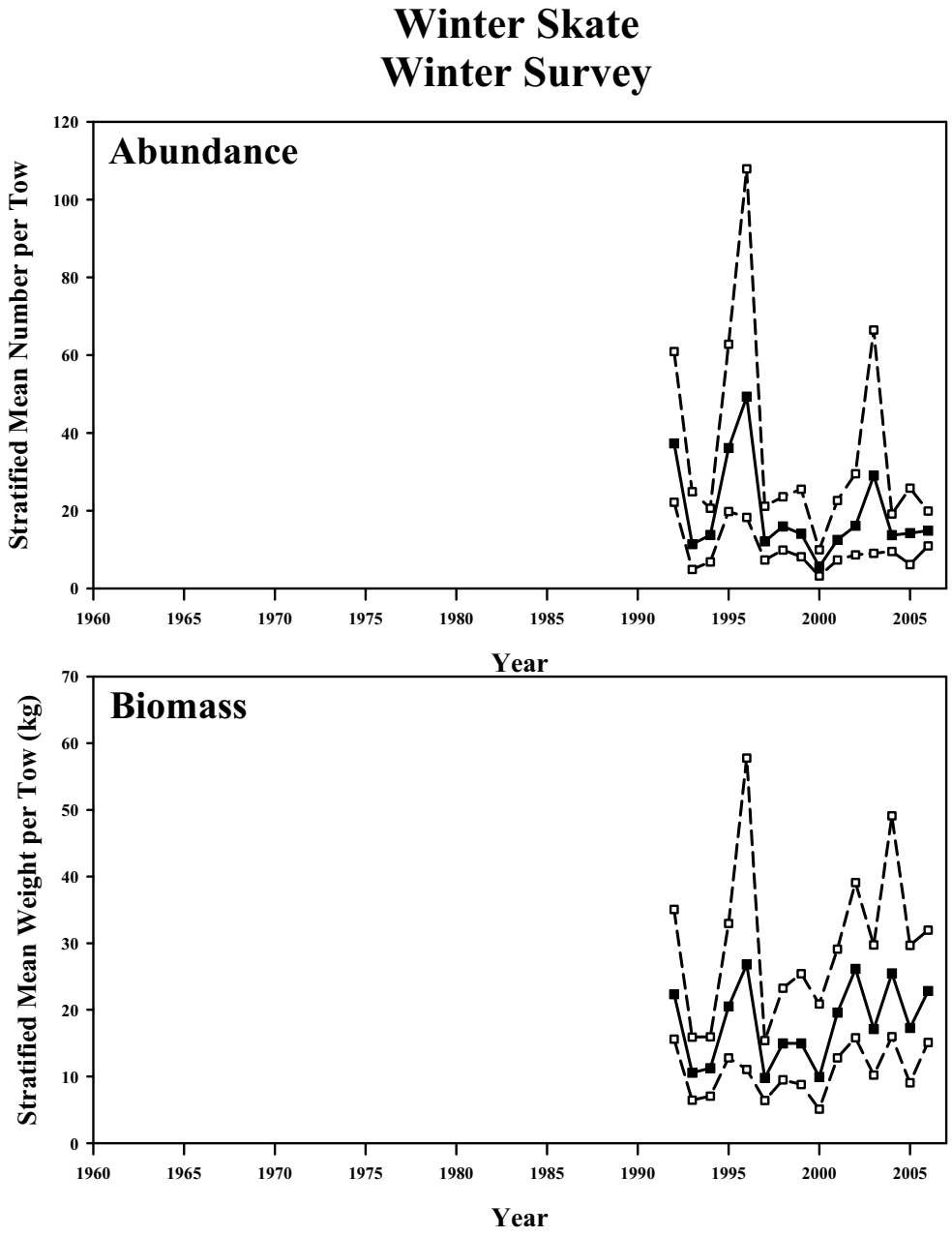


Figure B2.22. Bootstrapped abundance and biomass of winter skate from the NESFC winter bottom trawl survey. Mean index in solid squares, 95% confidence interval in open squares.

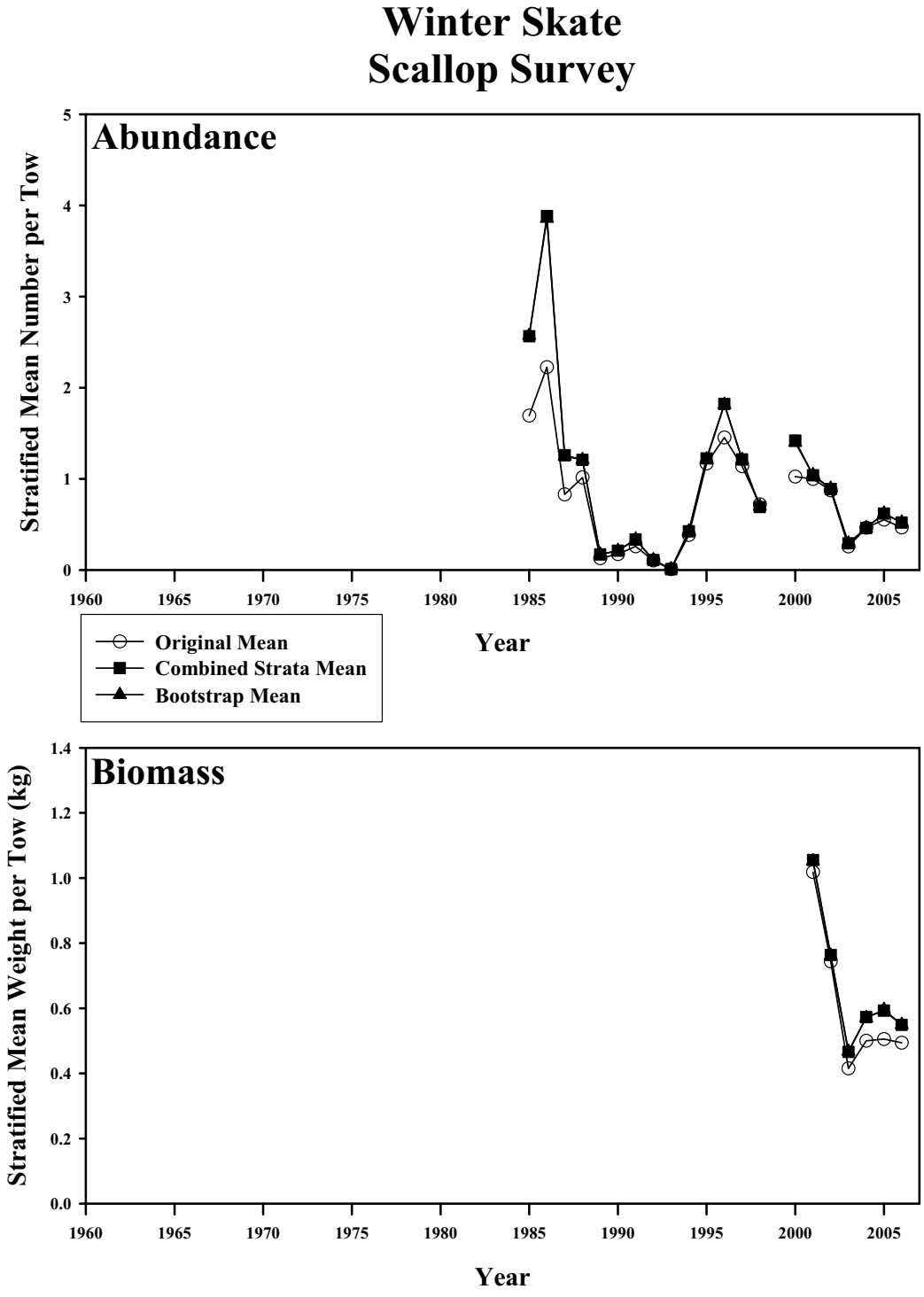


Figure B2.23. Abundance and biomass of winter skate from the NESFC scallop surveys from 1985-2006. The circles represent the original stratified mean, the squares represent the mean combining strata for bootstrapping, and the triangles represent the bootstrapped mean.

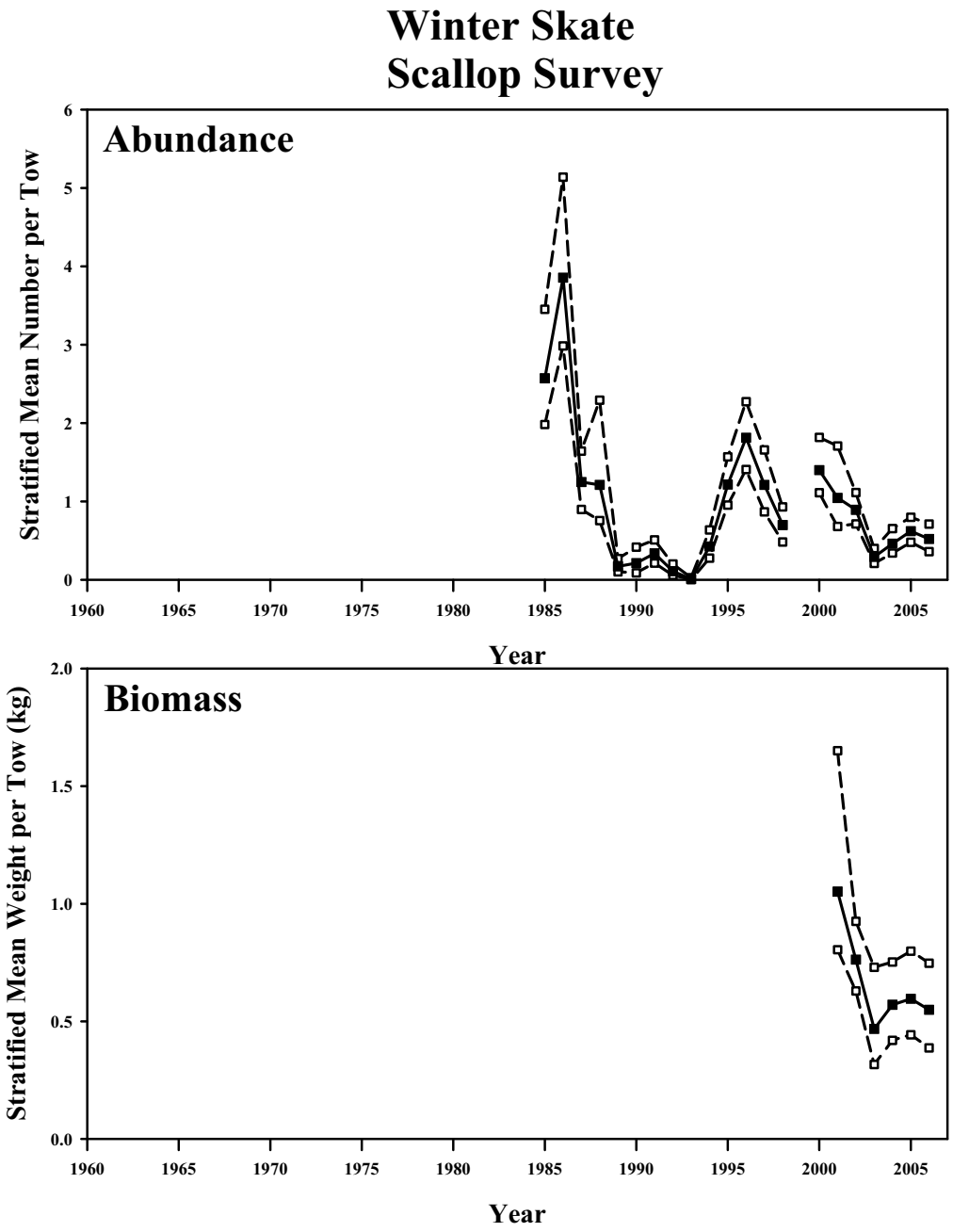


Figure B2.24. Bootstrapped abundance and biomass of winter skate from the NESFC scallop survey. Mean index in solid squares, 95% confidence interval in open squares.

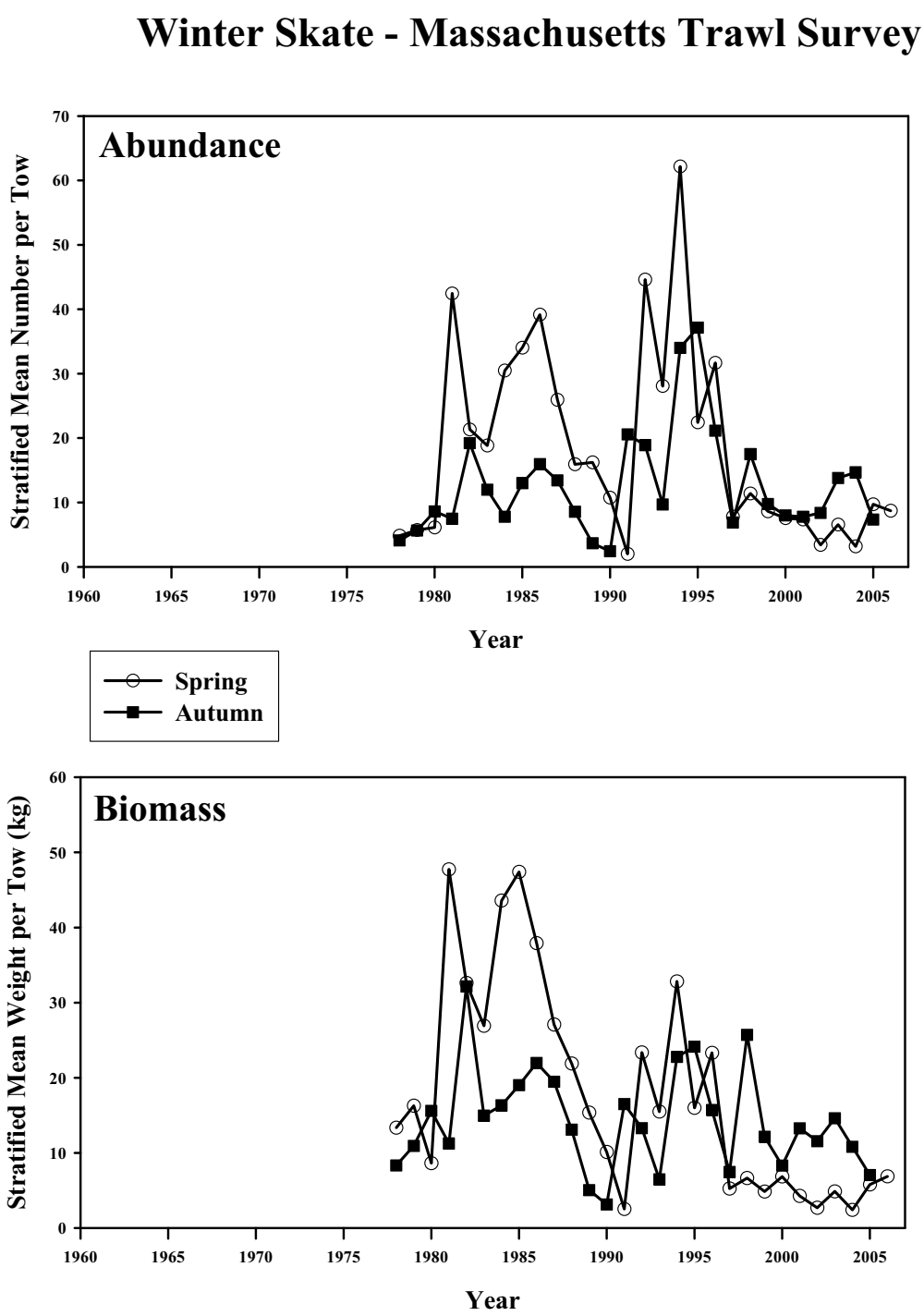


Figure B2.25. Abundance and biomass of winter skate from the Massachusetts spring and autumn finfish bottom trawl survey in state waters (strata 11-36).

Winter Skate - CTDEP Finfish Survey

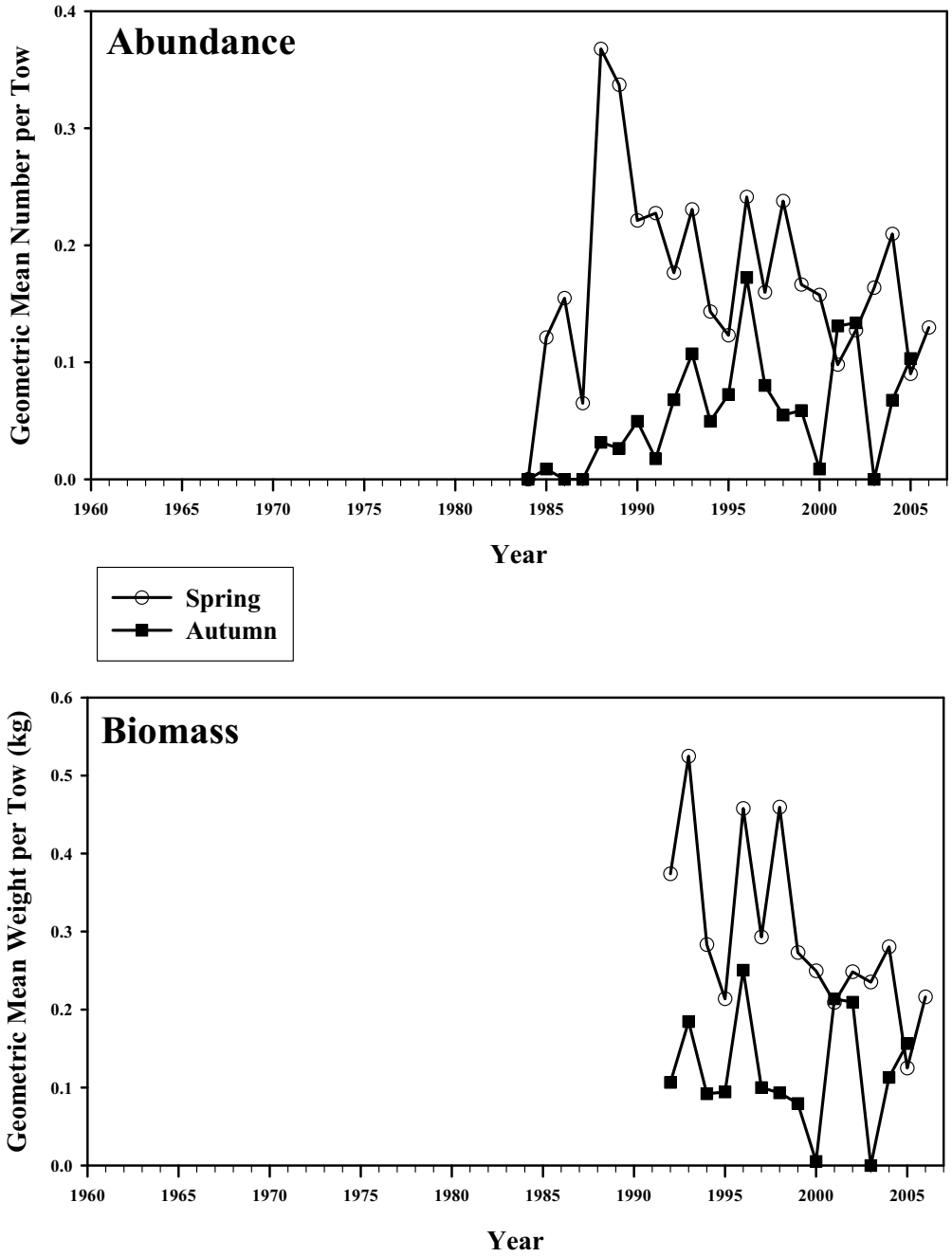


Figure B2.26. Abundance and biomass of winter skate from the CTDEP spring and autumn finfish bottom trawl survey in Connecticut state waters, 1984-2006.

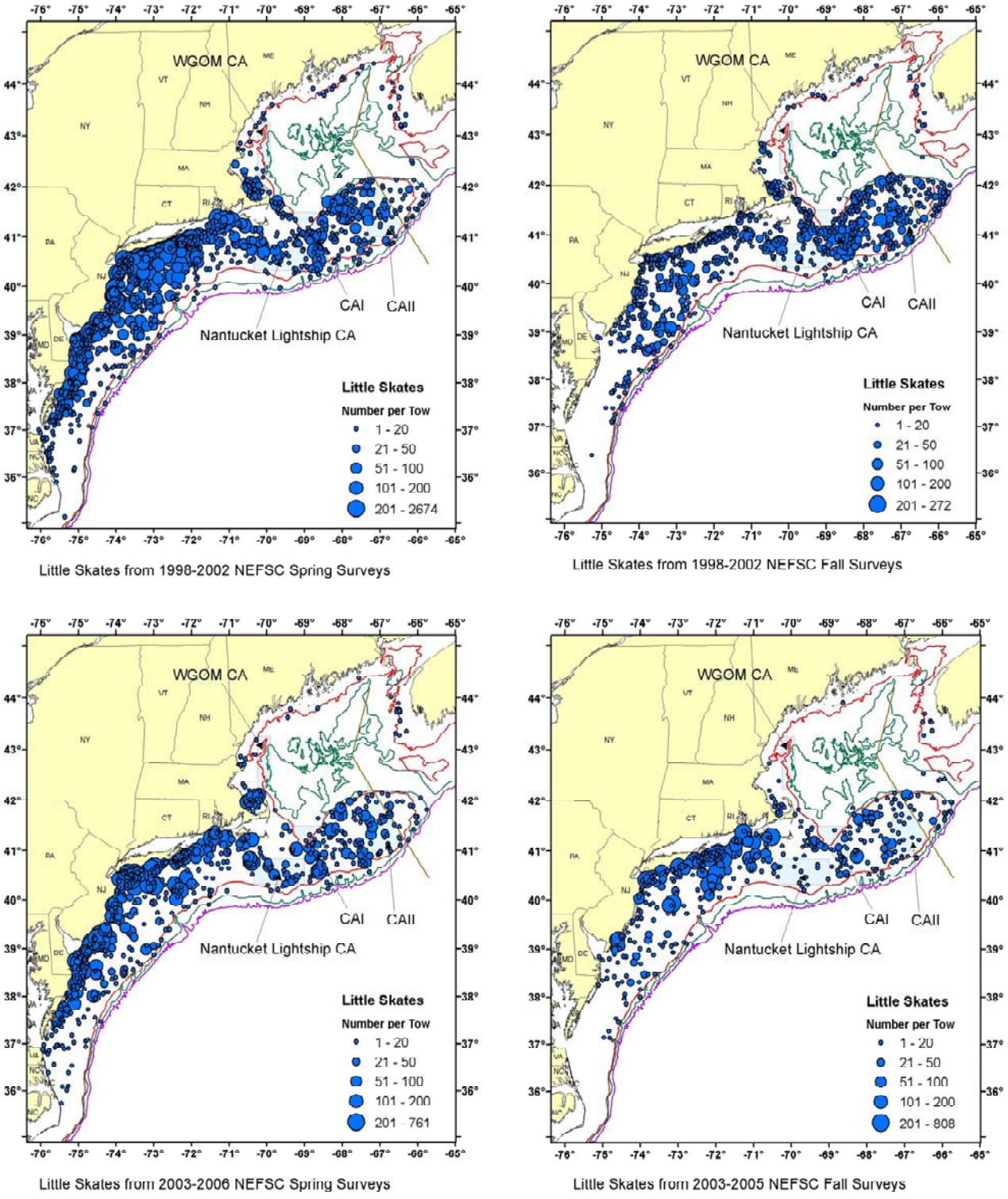
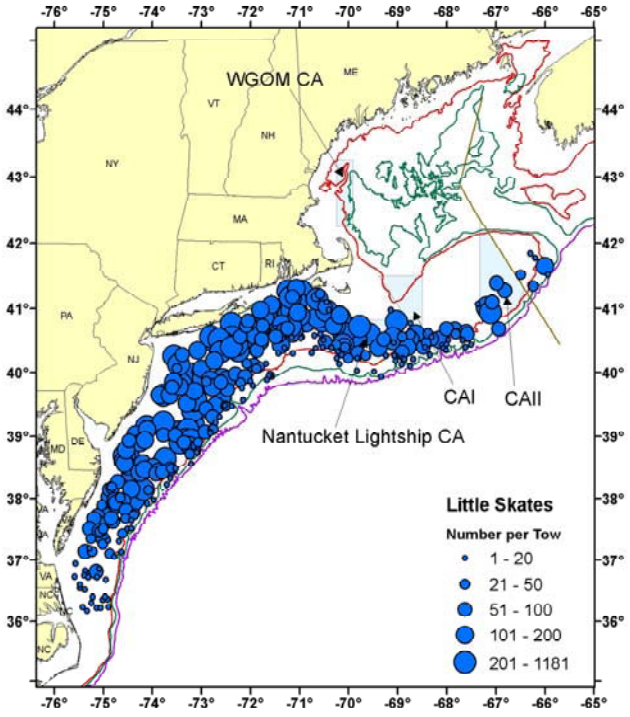
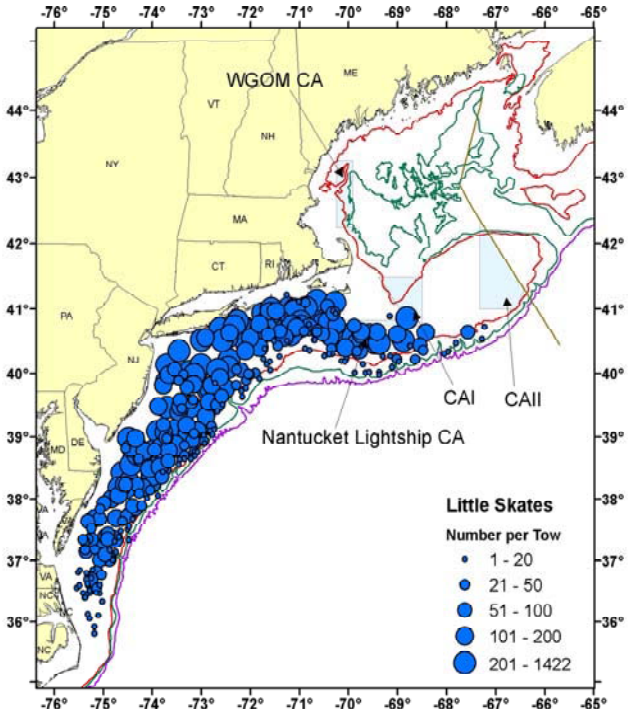


Figure B2.27. Distribution of little skate from the spring and autumn NEFSC surveys from 1998-2006.



Little Skates from 2000-2002 NEFSC Winter Surveys



Little Skates from 2003-2006 NEFSC Winter Surveys

Figure B2.28. Distribution of little skate from the NEFSC winter surveys from 2000-2006.

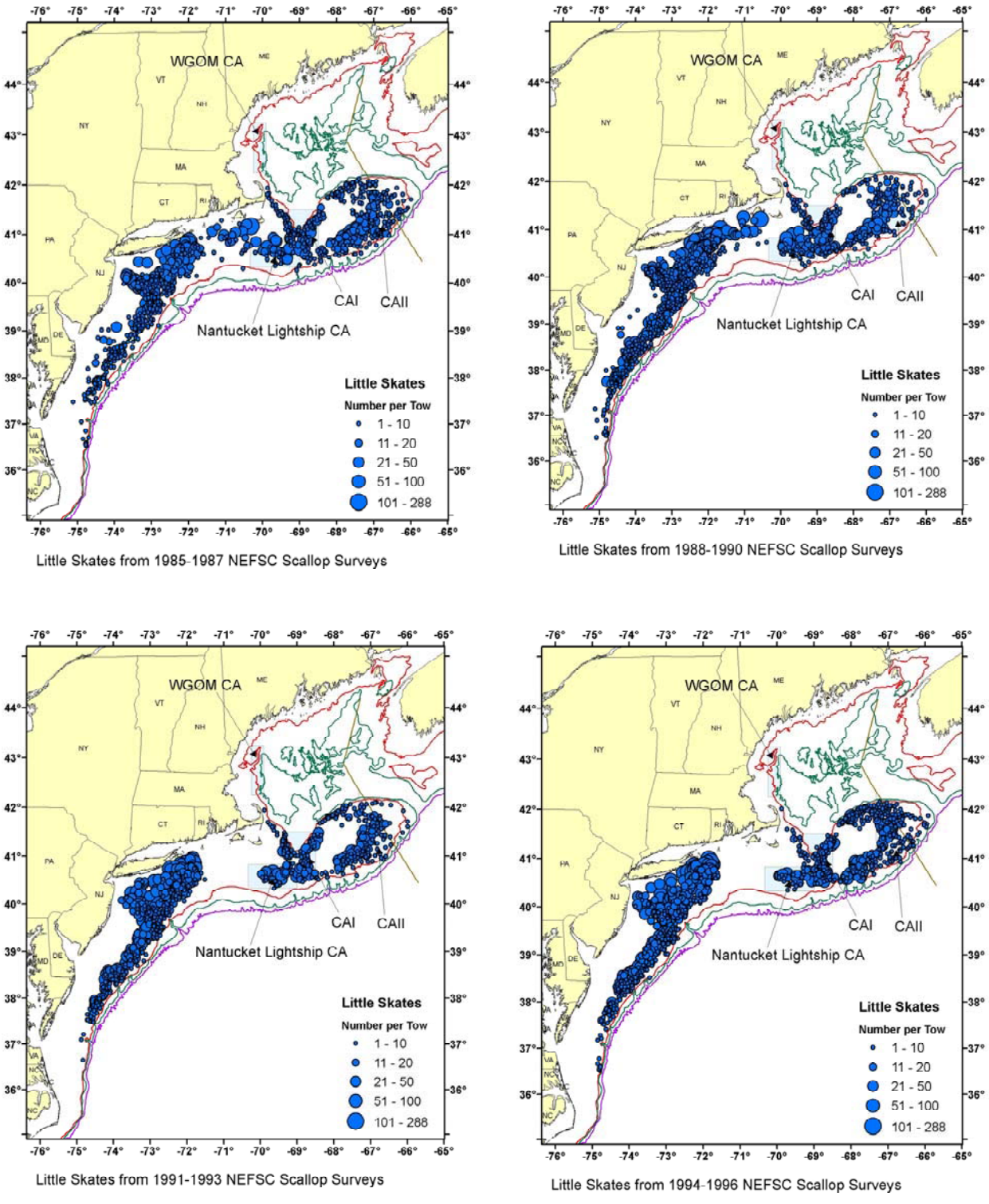
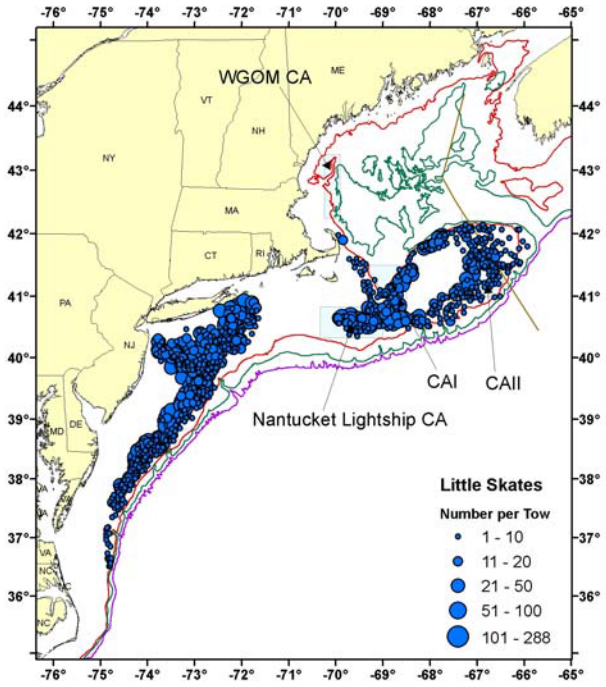
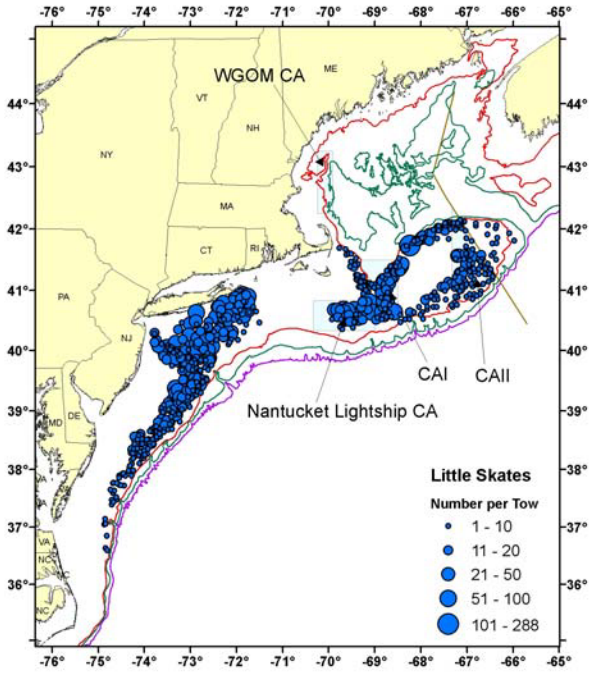


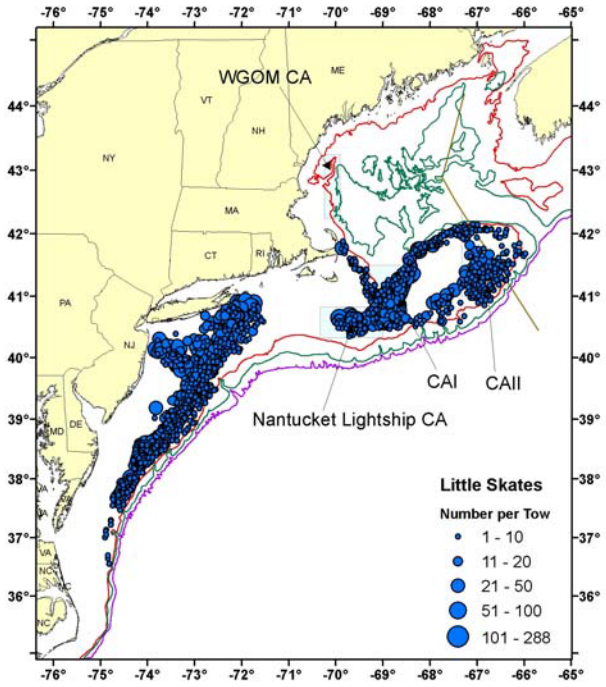
Figure B2.29. Distribution of little skate from the NEFSC scallop surveys from 1985-1996.



Little Skates from 1997-1999 NEFSC Scallop Surveys



Little Skates from 2000-2002 NEFSC Scallop Surveys



Little Skates from 2003-2006 NEFSC Scallop Surveys

Figure B2.30. Distribution of little skate from the NEFSC scallop surveys from 1997-2006.

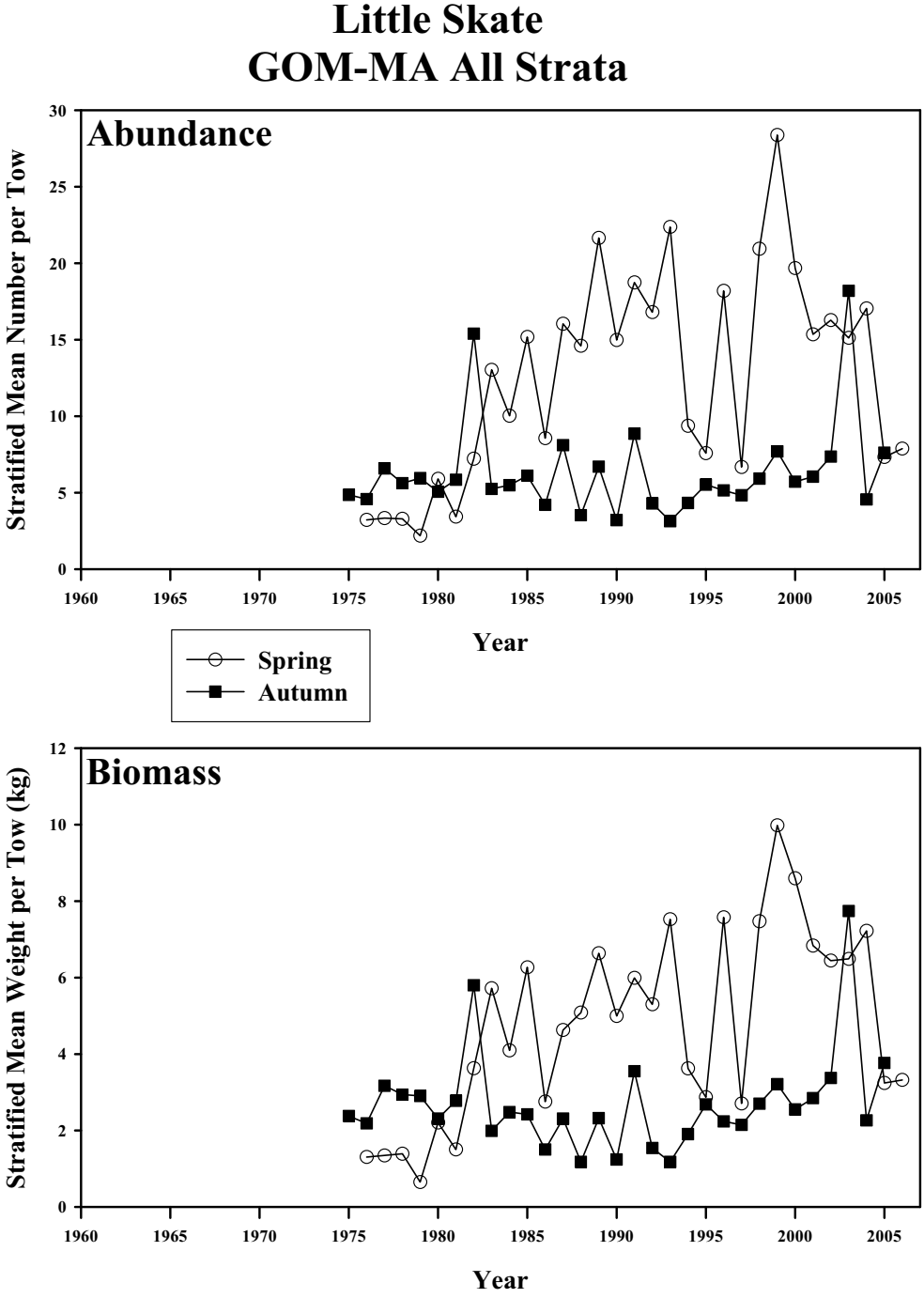


Figure B2.31. Abundance and biomass of little skate from the NESFC spring (circles) and autumn (squares) bottom trawl surveys from 1975-2006 in the Gulf of Maine to Mid-Atlantic (all strata).

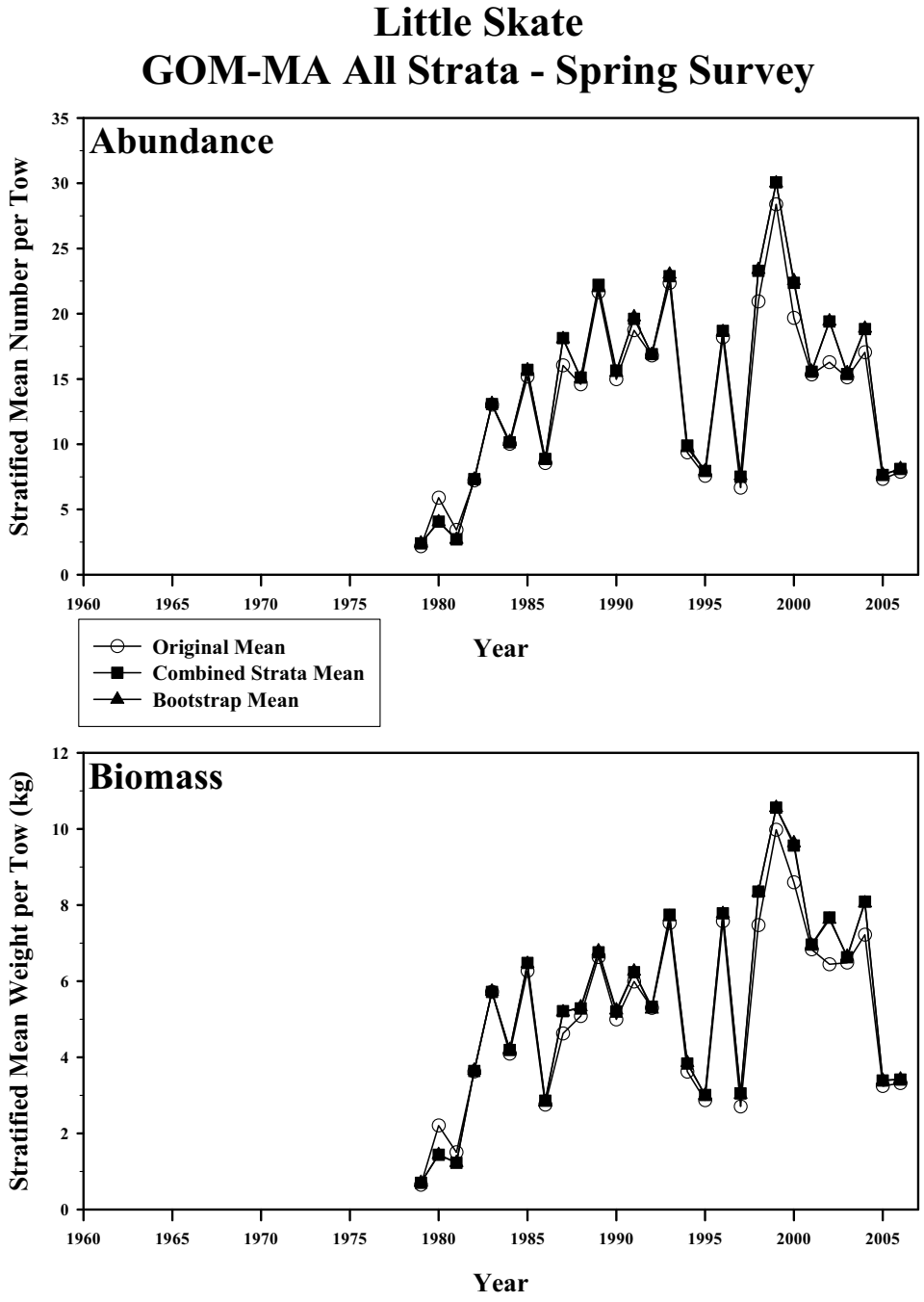


Figure B2.32. Abundance and biomass of little skate from the NESFC spring bottom trawl surveys from 1979-2006 in the Gulf of Maine to Mid-Atlantic (all strata). The circles represent the original stratified mean, the squares represent the mean combining strata for bootstrapping, and the triangles represent the bootstrapped mean.

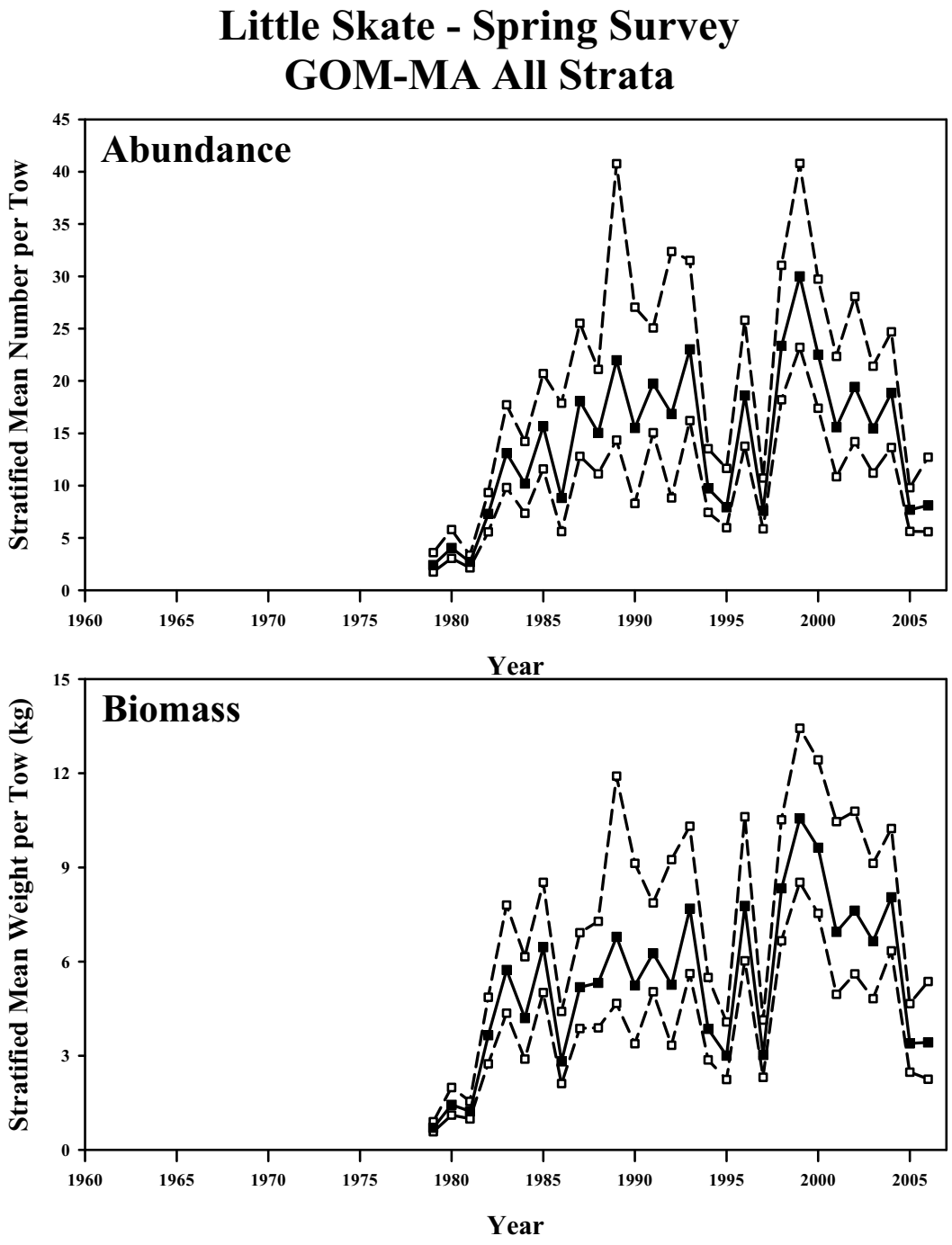


Figure B2.33. Bootstrapped abundance and biomass of little skate from the NESFC spring bottom trawl survey in the Gulf of Maine to Mid-Atlantic region (all strata). Mean index in solid squares, 95% confidence interval in open squares.

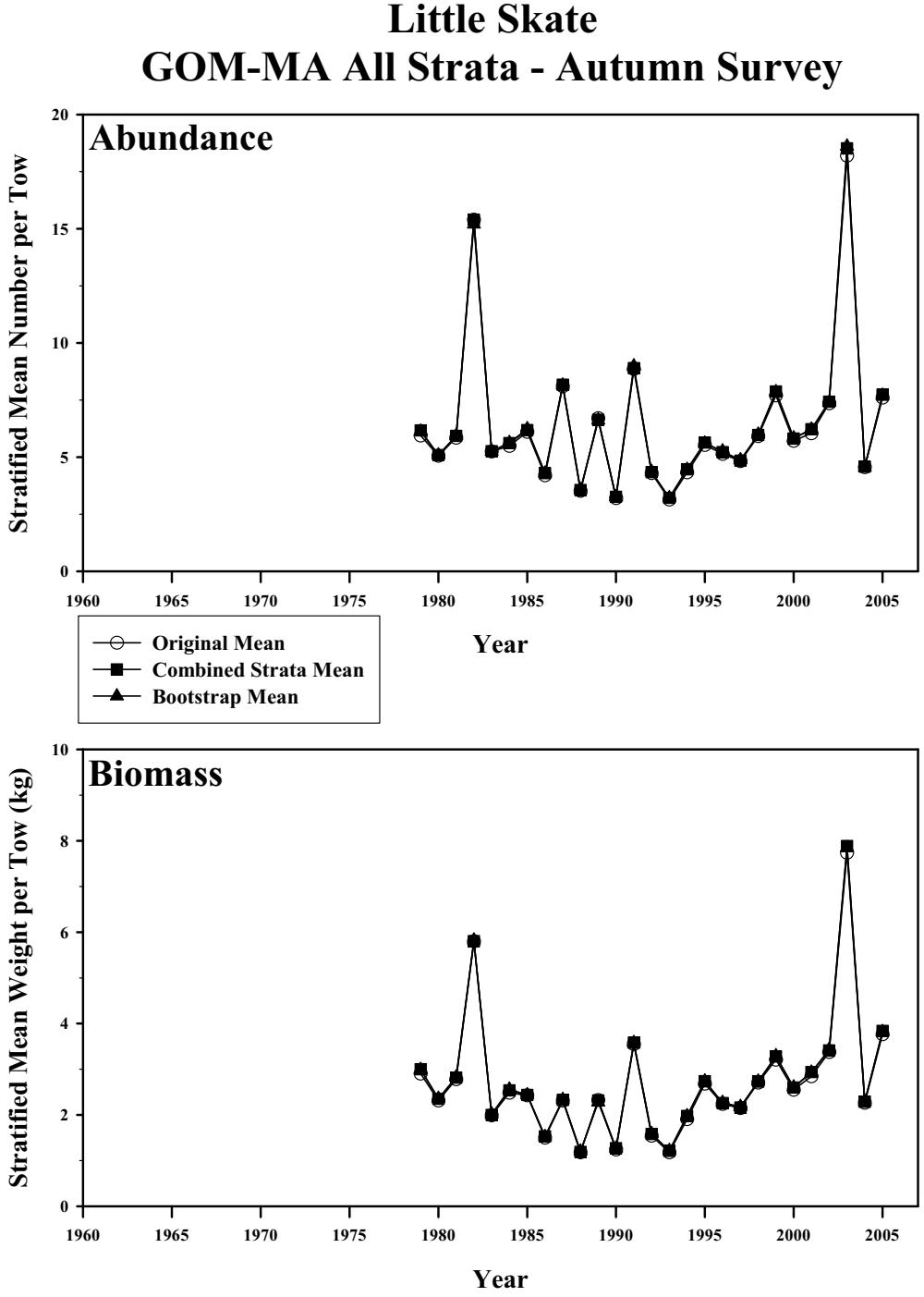


Figure B2.34. Abundance and biomass of little skate from the NESFC autumn bottom trawl surveys from 1979-2005 in the Gulf of Maine to Mid-Atlantic (all strata). The circles represent the original stratified mean, the squares represent the mean combining strata for bootstrapping, and the triangles represent the bootstrapped mean.

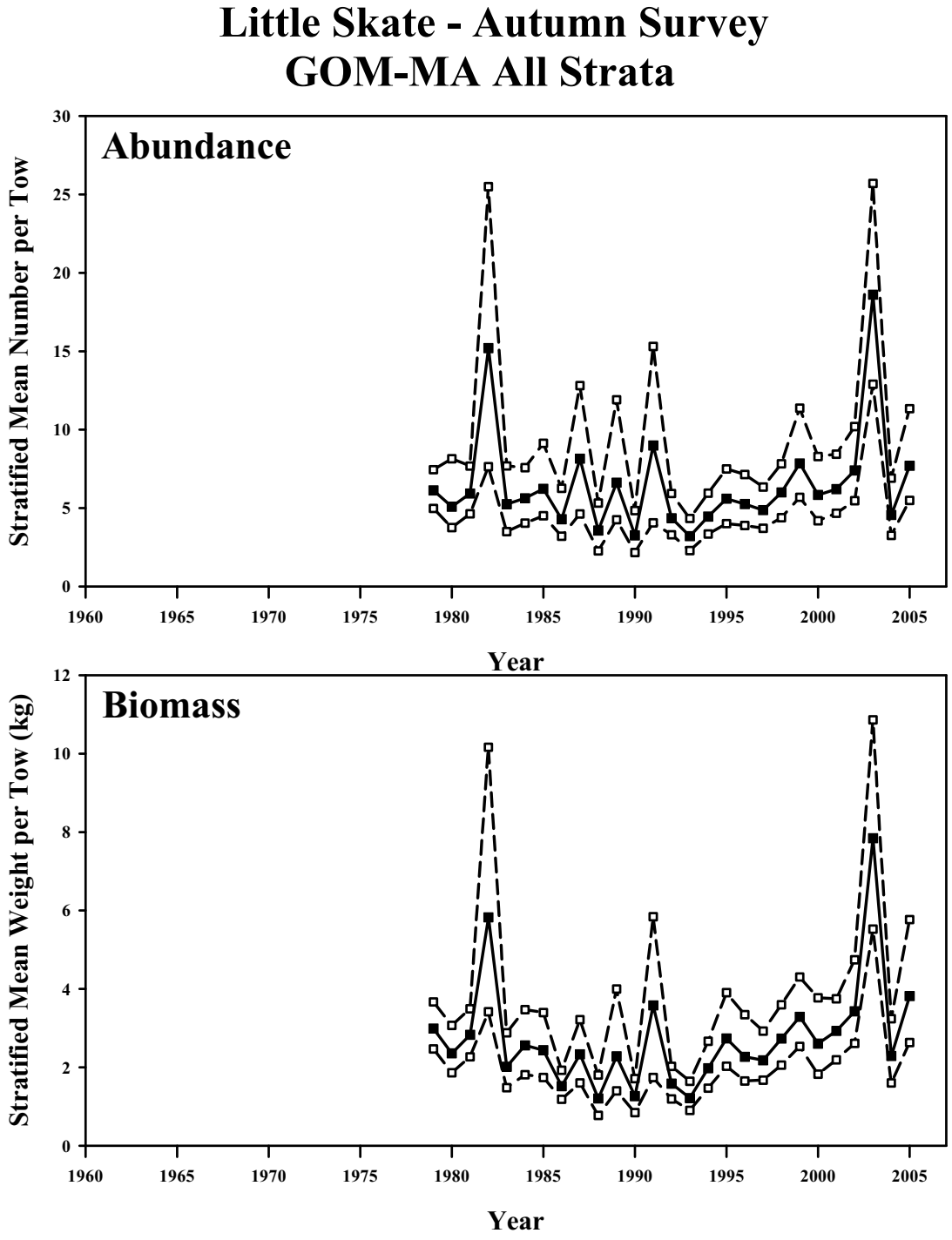


Figure B2.35. Bootstrapped abundance and biomass of little skate from the NESFC autumn bottom trawl survey in the Gulf of Maine to Mid-Atlantic region (all strata). Mean index in solid squares, 95% confidence interval in open squares.

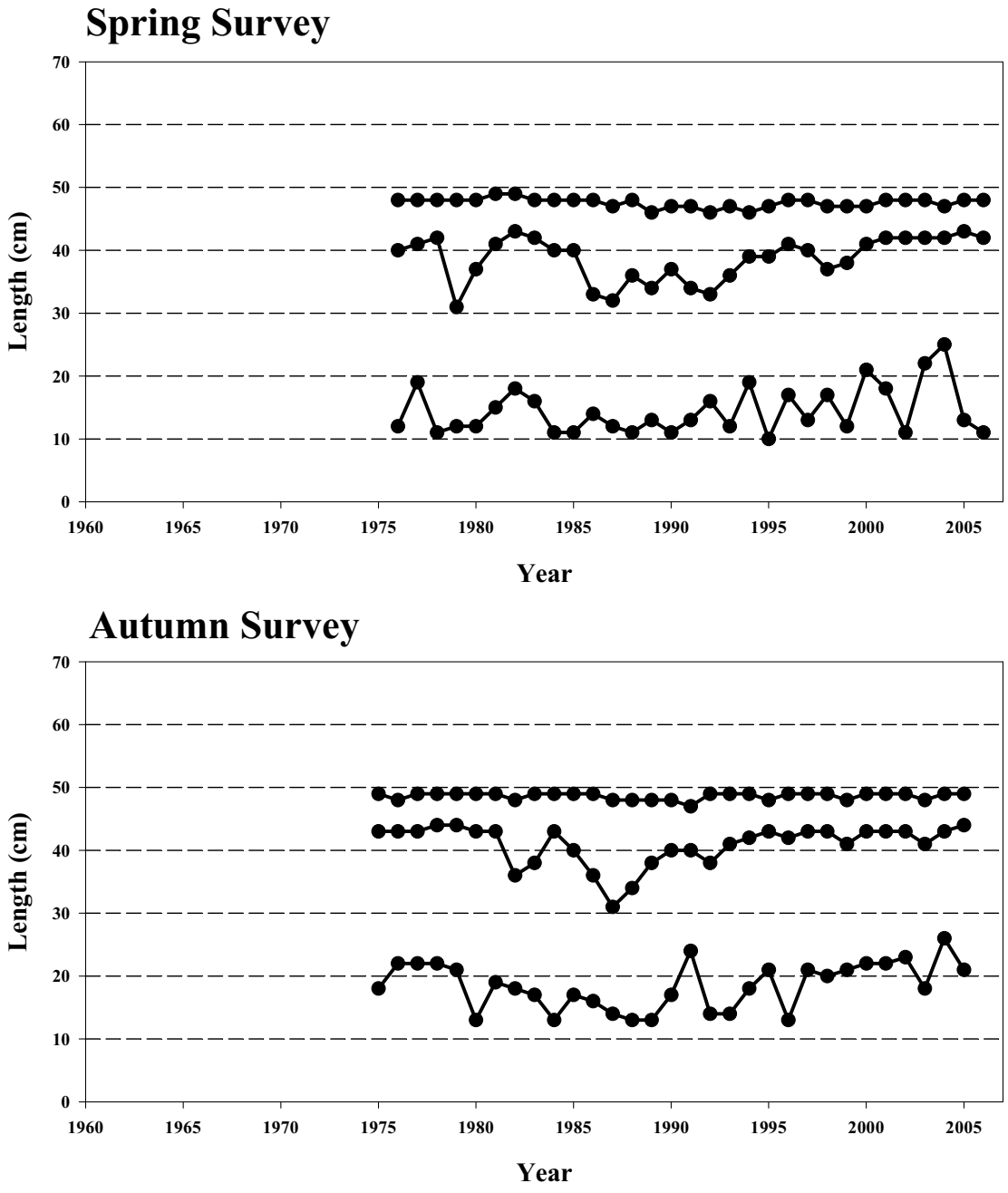


Figure B2.36. Percentiles of length composition (5, 50, and 95) of little skate from the NESFC spring and autumn bottom trawl surveys from 1975-2006 in the Gulf of Maine to Mid-Atlantic region (all strata).

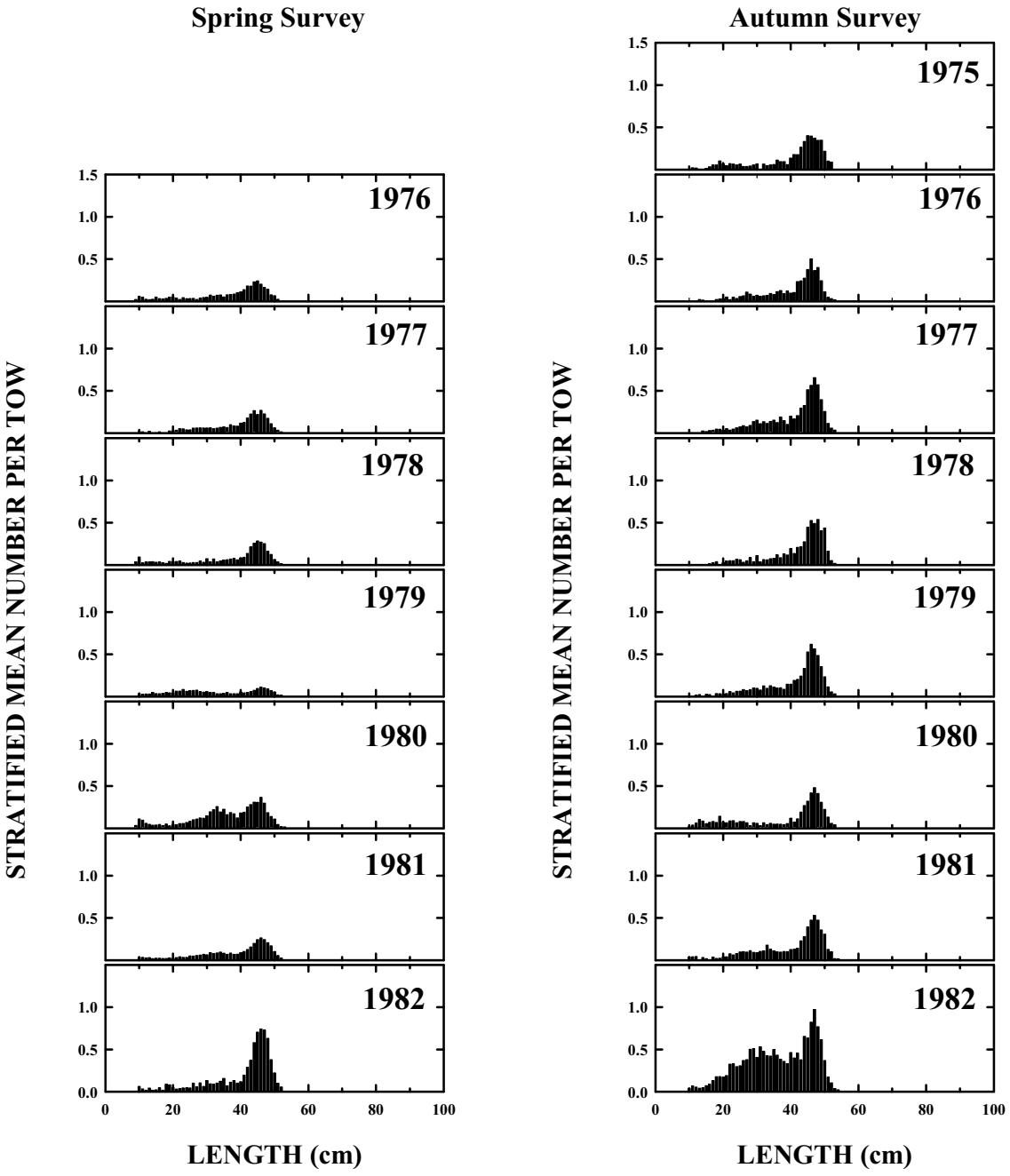


Figure B2.37. Little skate length composition from the NEFSC spring and autumn bottom trawl surveys in the Gulf of Maine to Mid-Atlantic (all strata), 1975-1982.

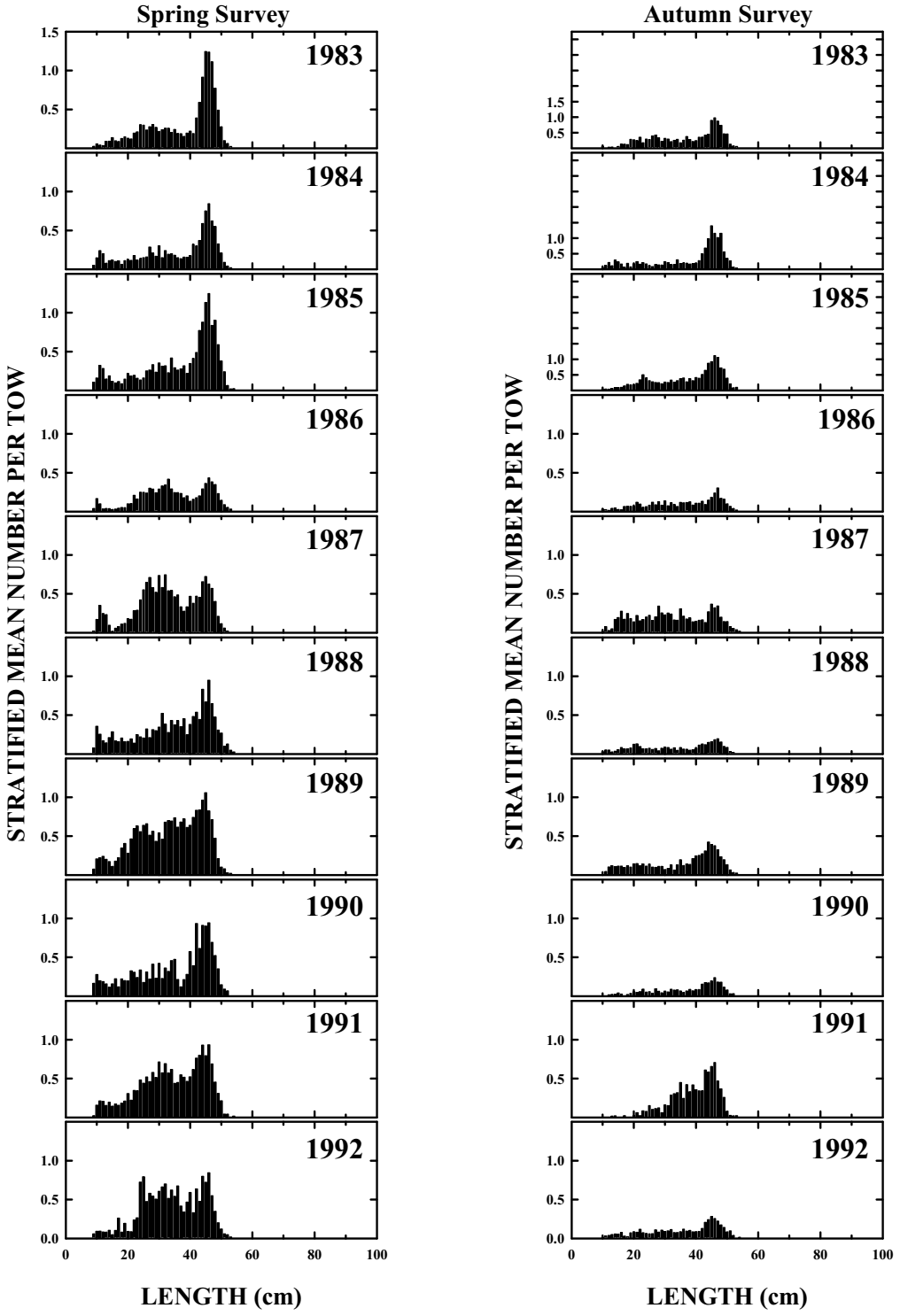


Figure B2.38. Little skate length composition from the NEFSC spring and autumn bottom trawl surveys in the Gulf of Maine to Mid-Atlantic (all strata), 1983-1992.

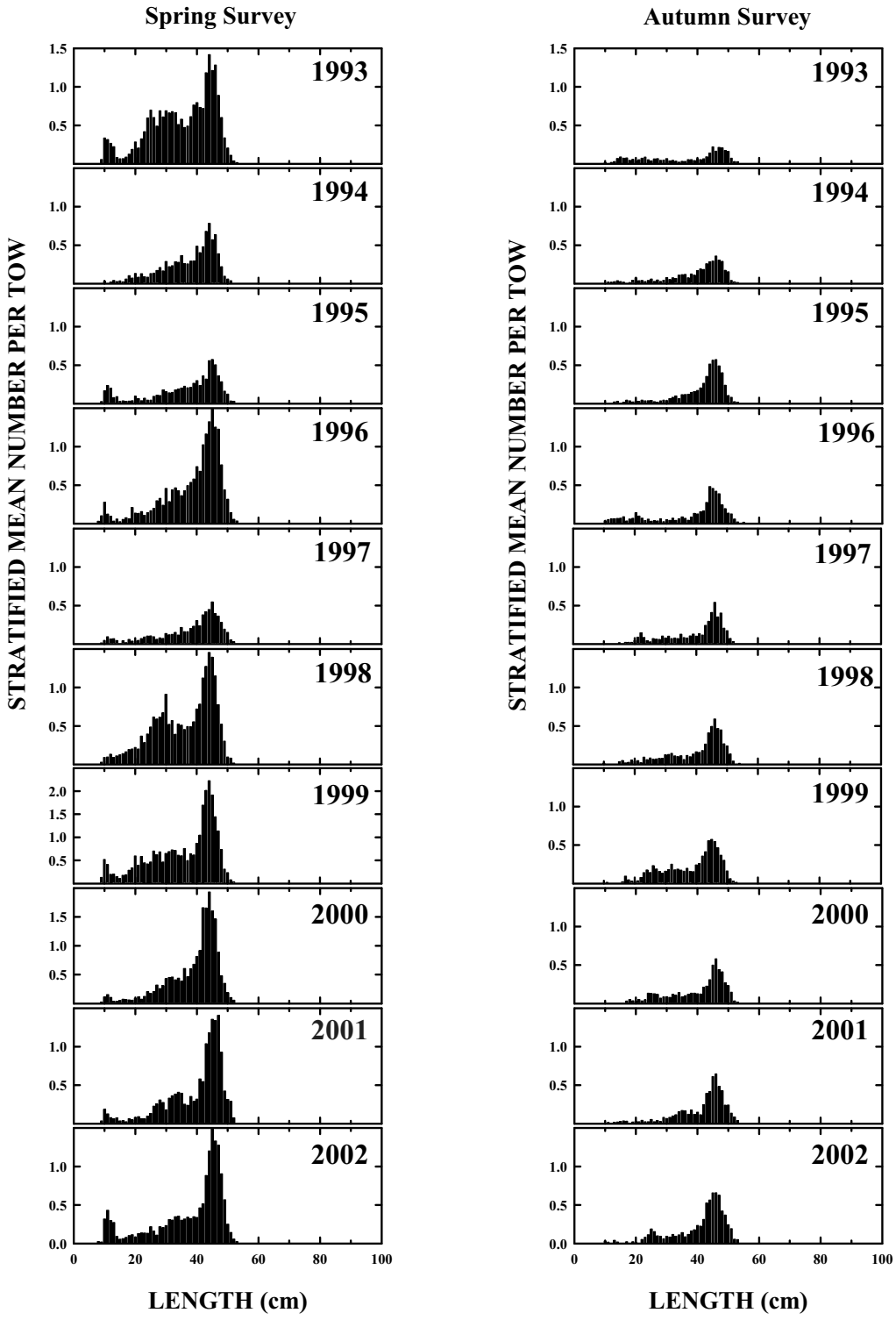


Figure B2.39. Little skate length composition from the NEFSC spring and autumn bottom trawl surveys in the Gulf of Maine to Mid-Atlantic (all strata), 1993-2002.

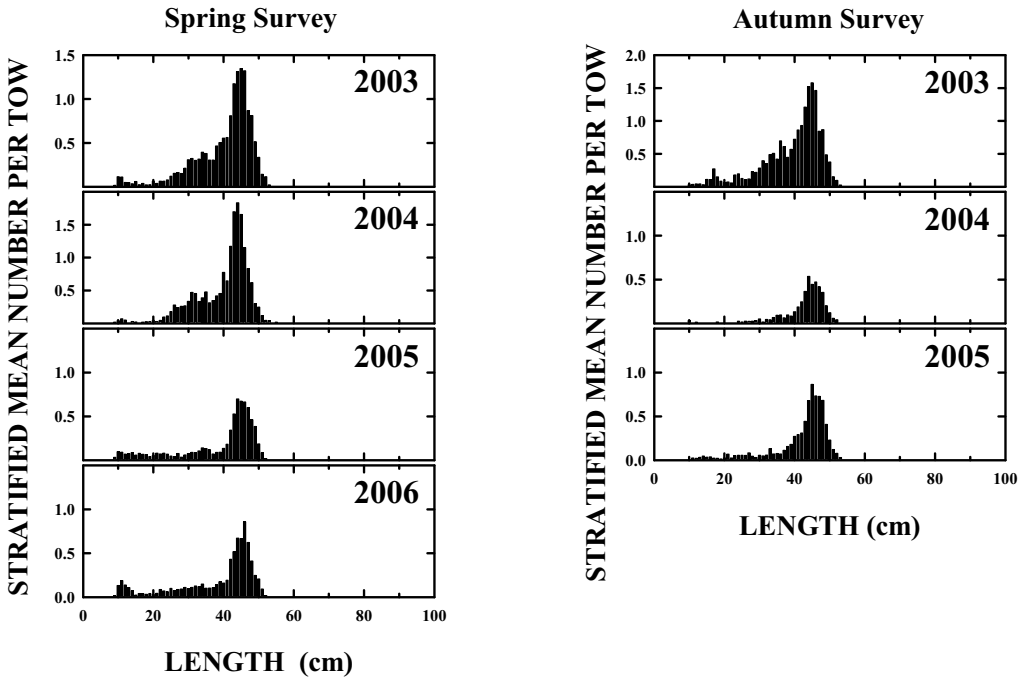


Figure B2.40. Little skate length composition from the NEFSC spring and autumn bottom trawl surveys in the Gulf of Maine to Mid-Atlantic (all strata), 2003-2006.

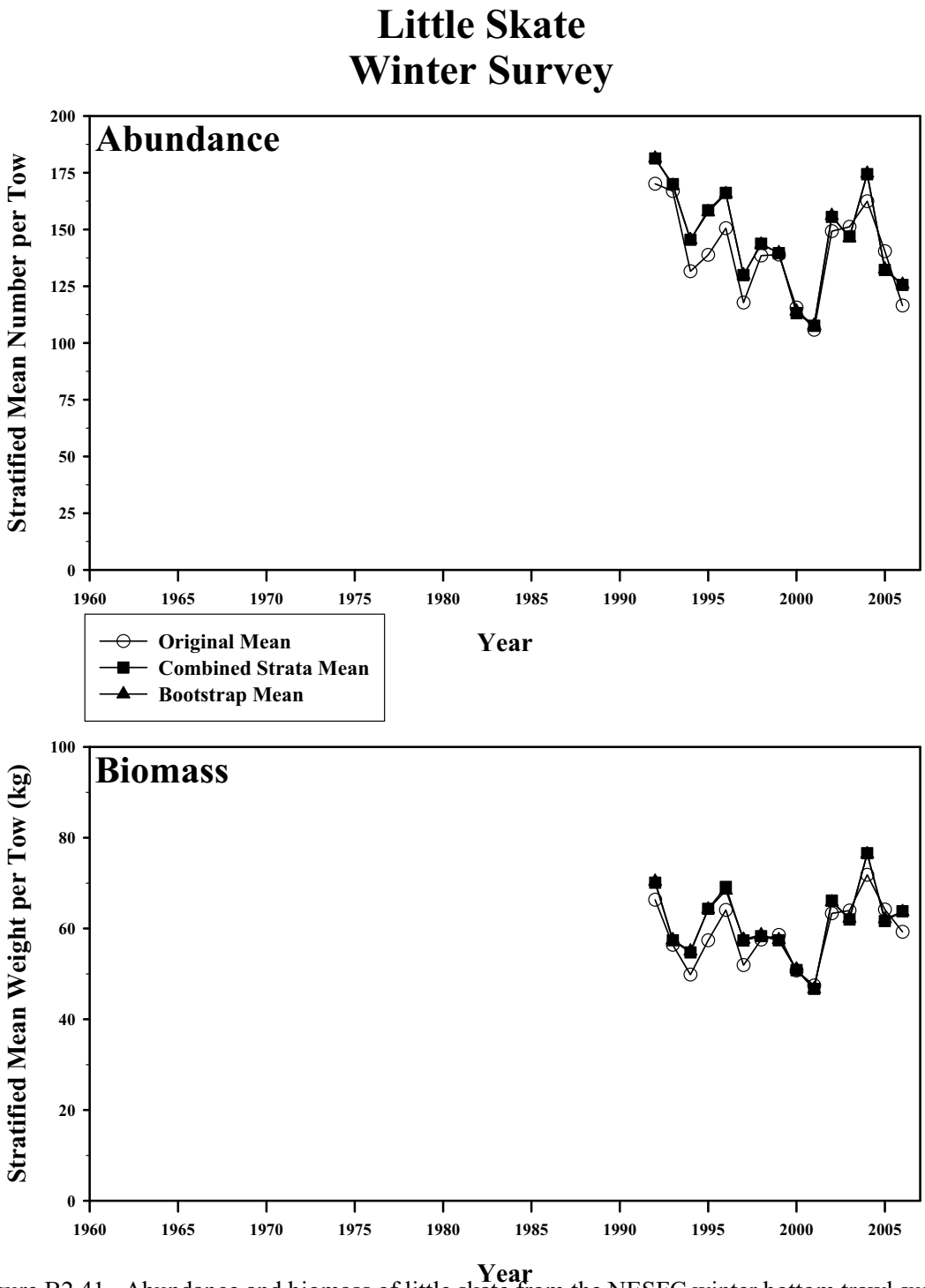


Figure B2.41. Abundance and biomass of little skate from the NESFC winter bottom trawl surveys from 1992-2006. The circles represent the original stratified mean, the squares represent the mean combining strata for bootstrapping, and the triangles represent the bootstrapped mean.

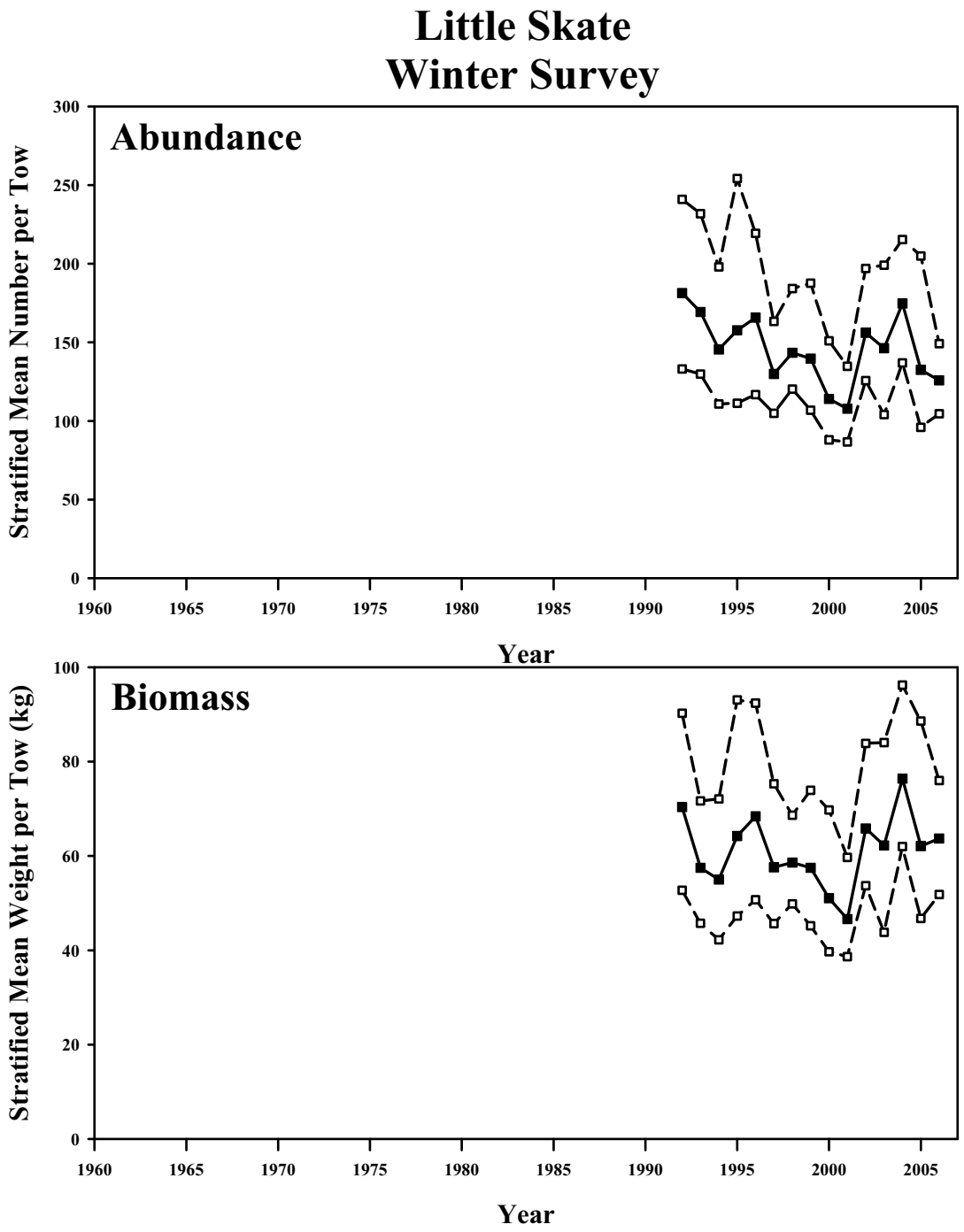


Figure B2.42. Bootstrapped abundance and biomass of little skate from the NESFC winter bottom trawl survey. Mean index in solid squares, 95% confidence interval in open squares.

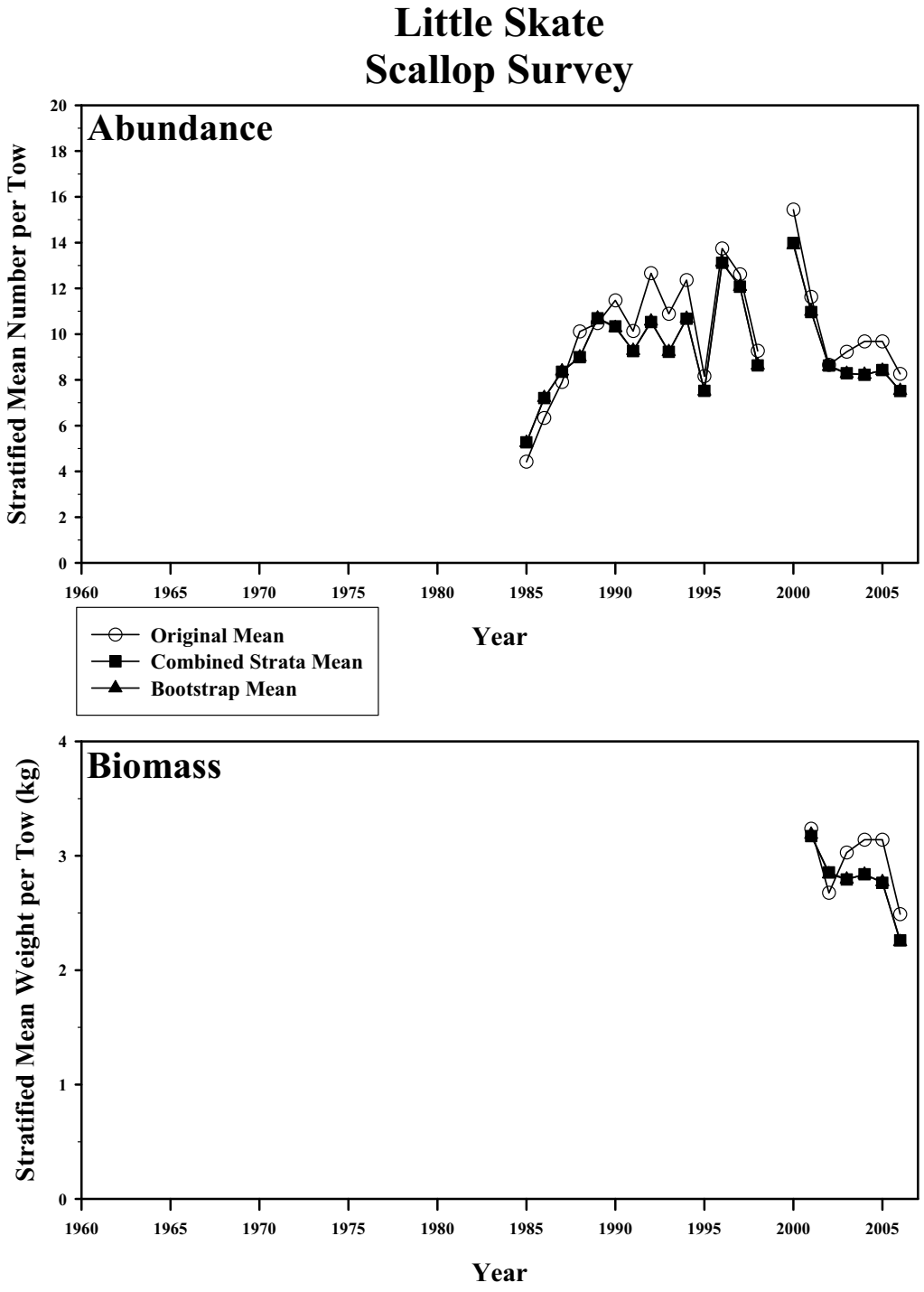


Figure B2.43. Abundance and biomass of little skate from the NESFC scallop surveys from 1985-2006. The circles represent the original stratified mean, the squares represent the mean combining strata for bootstrapping, and the triangles represent the bootstrapped mean.

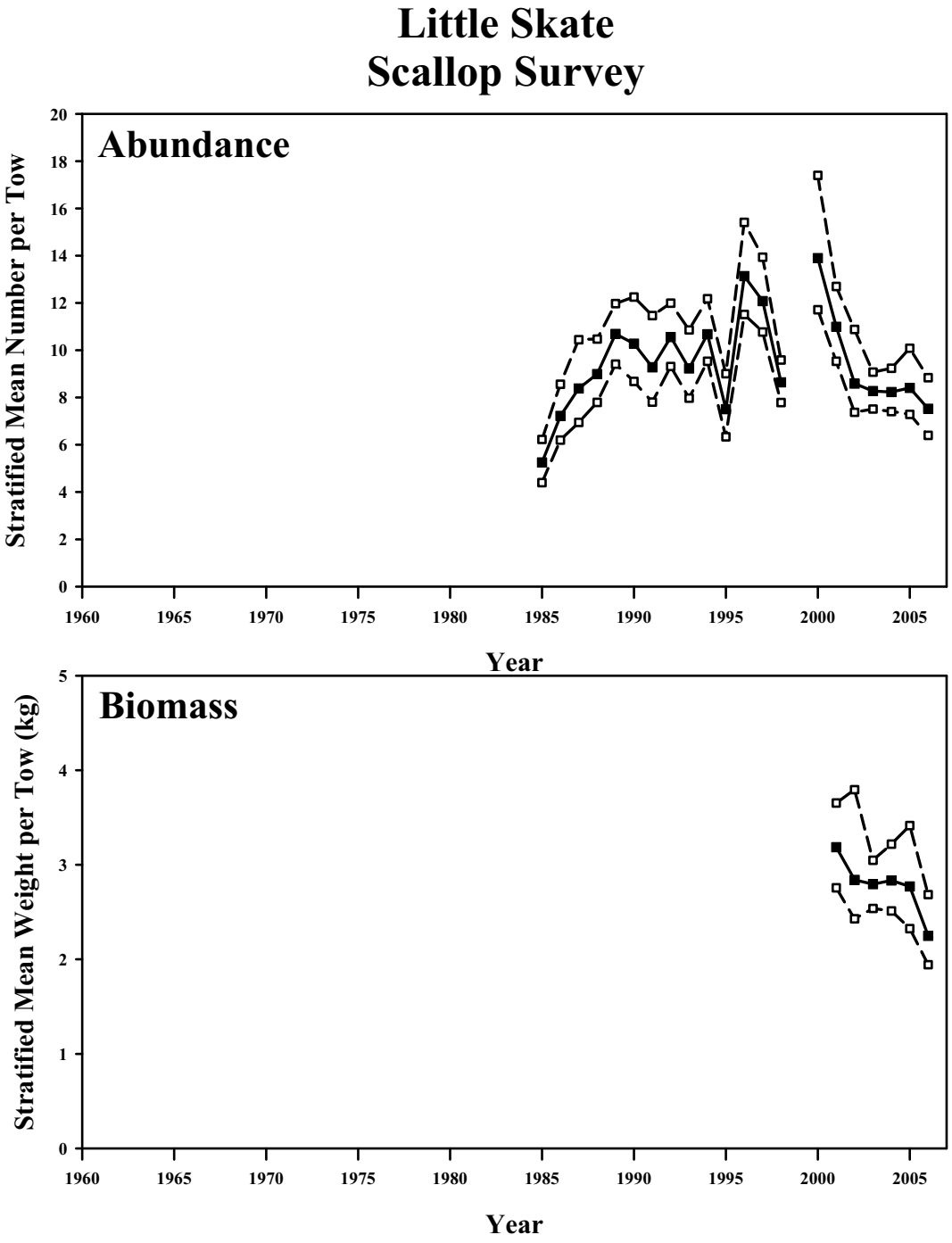


Figure B2.44. Bootstrapped abundance and biomass of little skate from the NESFC scallop survey. Mean index in solid squares, 95% confidence interval in open squares.

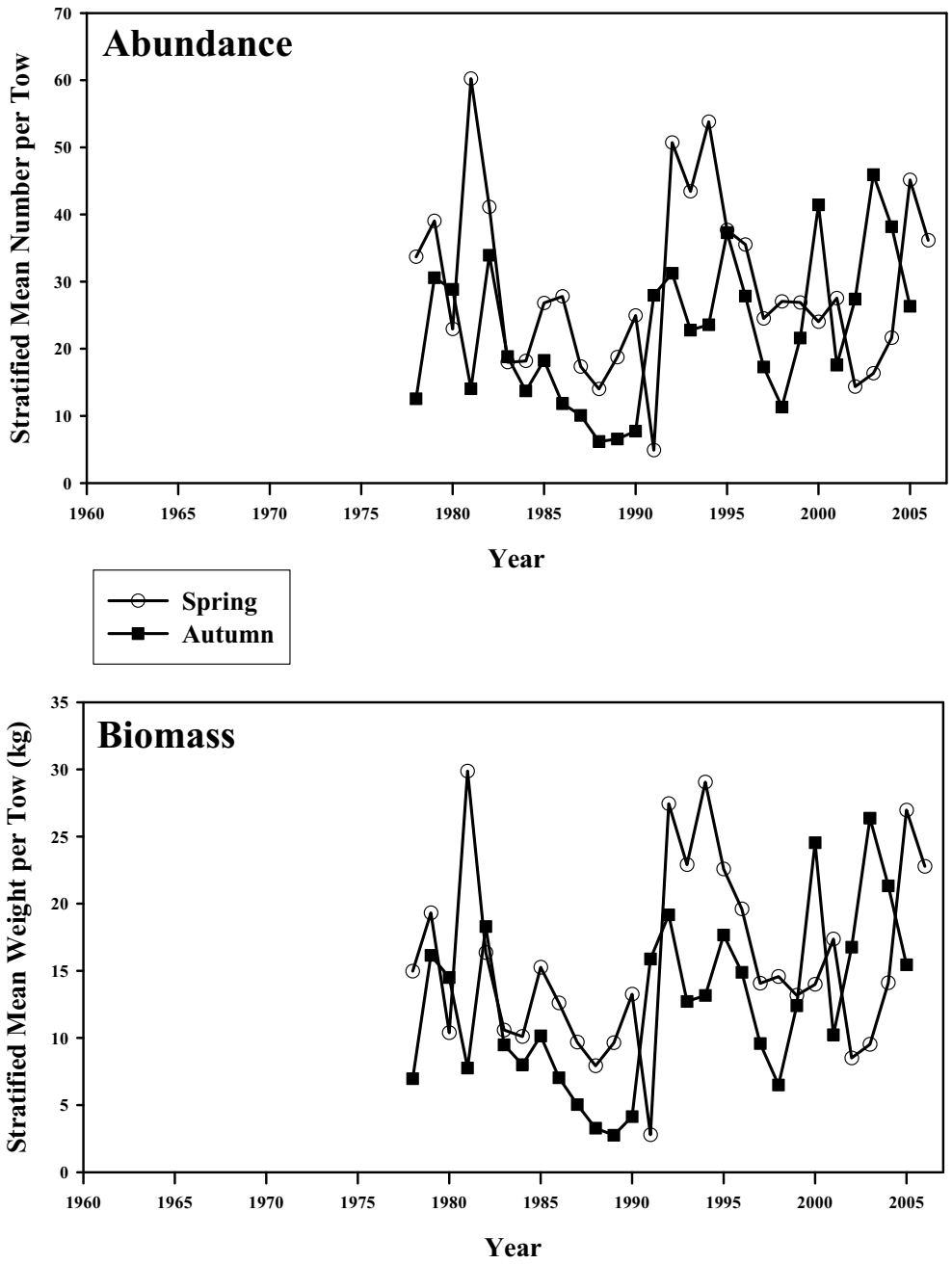


Figure 2.45. Abundance and biomass of little skate from the Massachusetts spring and autumn finfish bottom trawl survey in state waters (strata 11-36).

Little Skate - CTDEP Finfish Survey

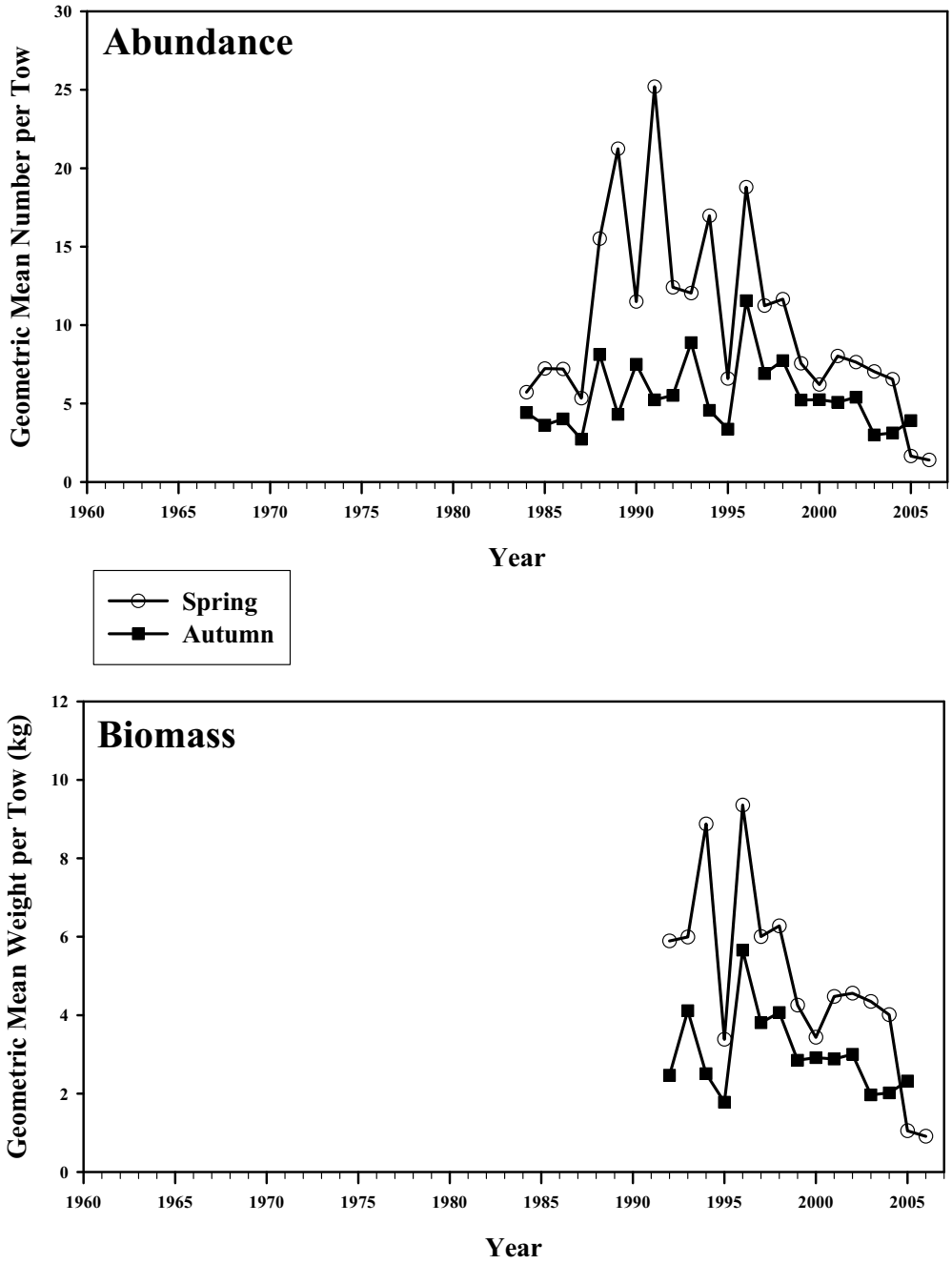


Figure B2.46. Abundance and biomass of little skate from the CTDEP spring and autumn finfish bottom trawl survey in Connecticut state waters, 1984-2006.

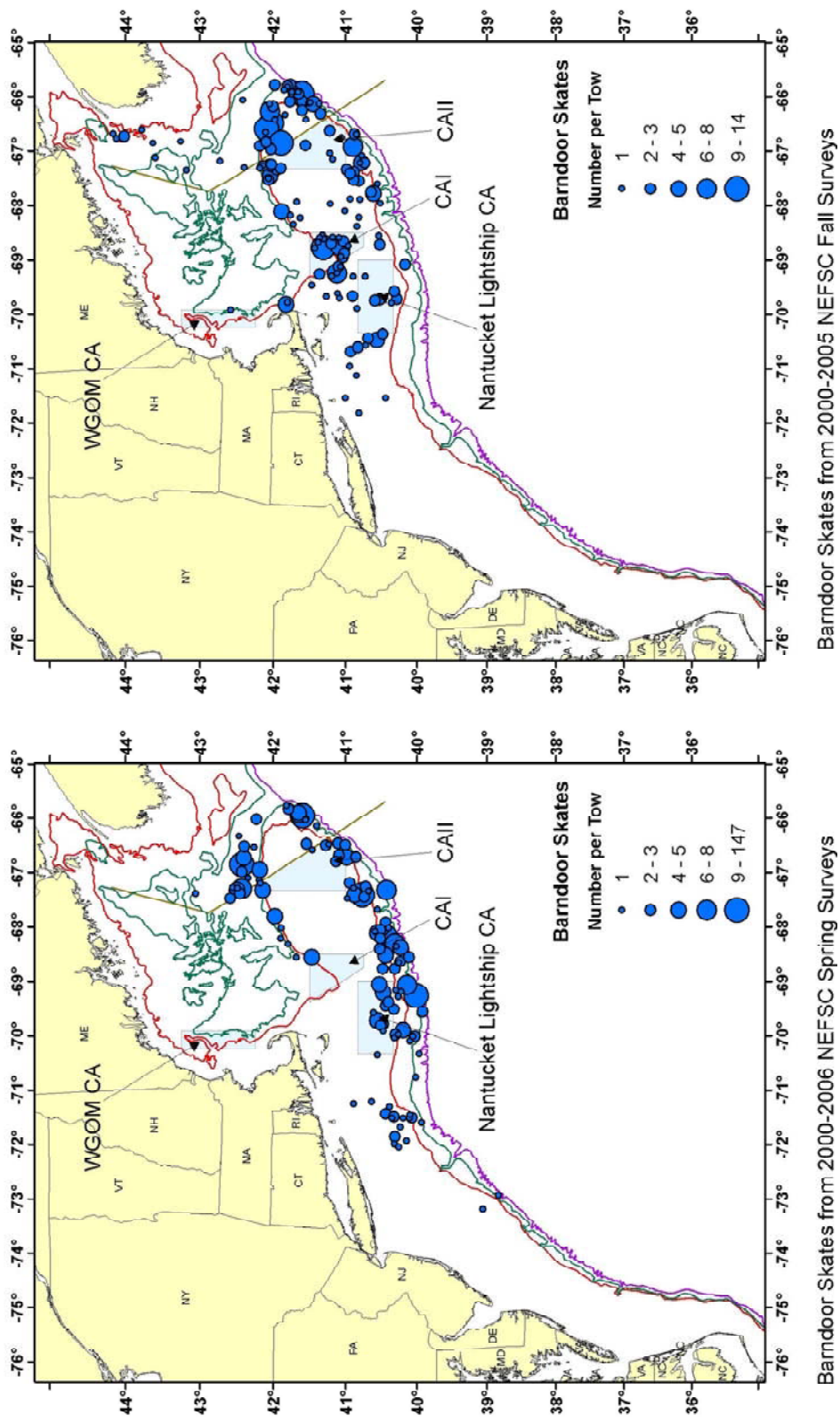


Figure B2.47. Distribution of barndoor skate from the spring and autumn NEFSC surveys from 2000-2006.

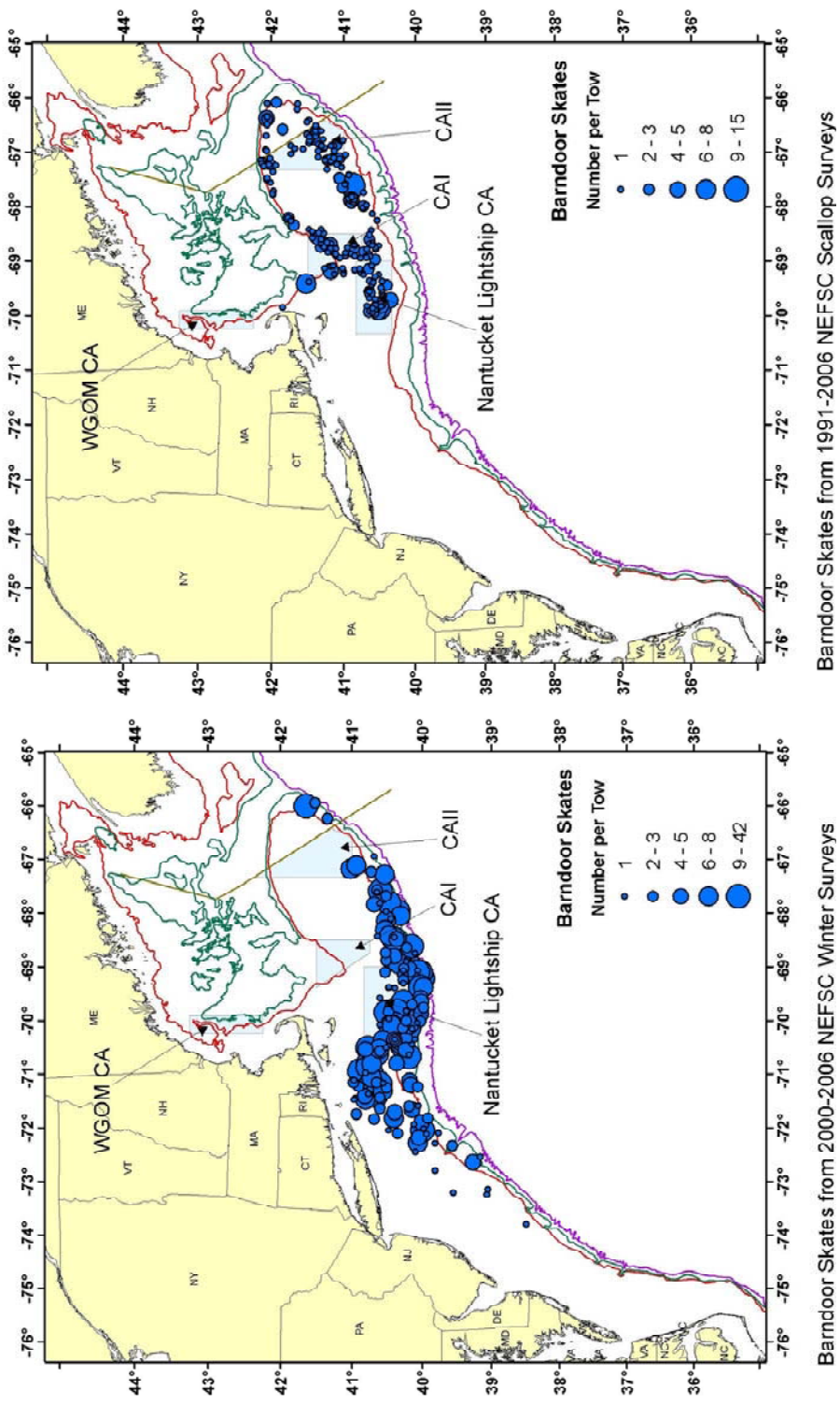


Figure B2.48. Distribution of barndoor skate from the winter NEFSC surveys from 2000-2006 and the NEFSC scallop surveys from 1991-2006.

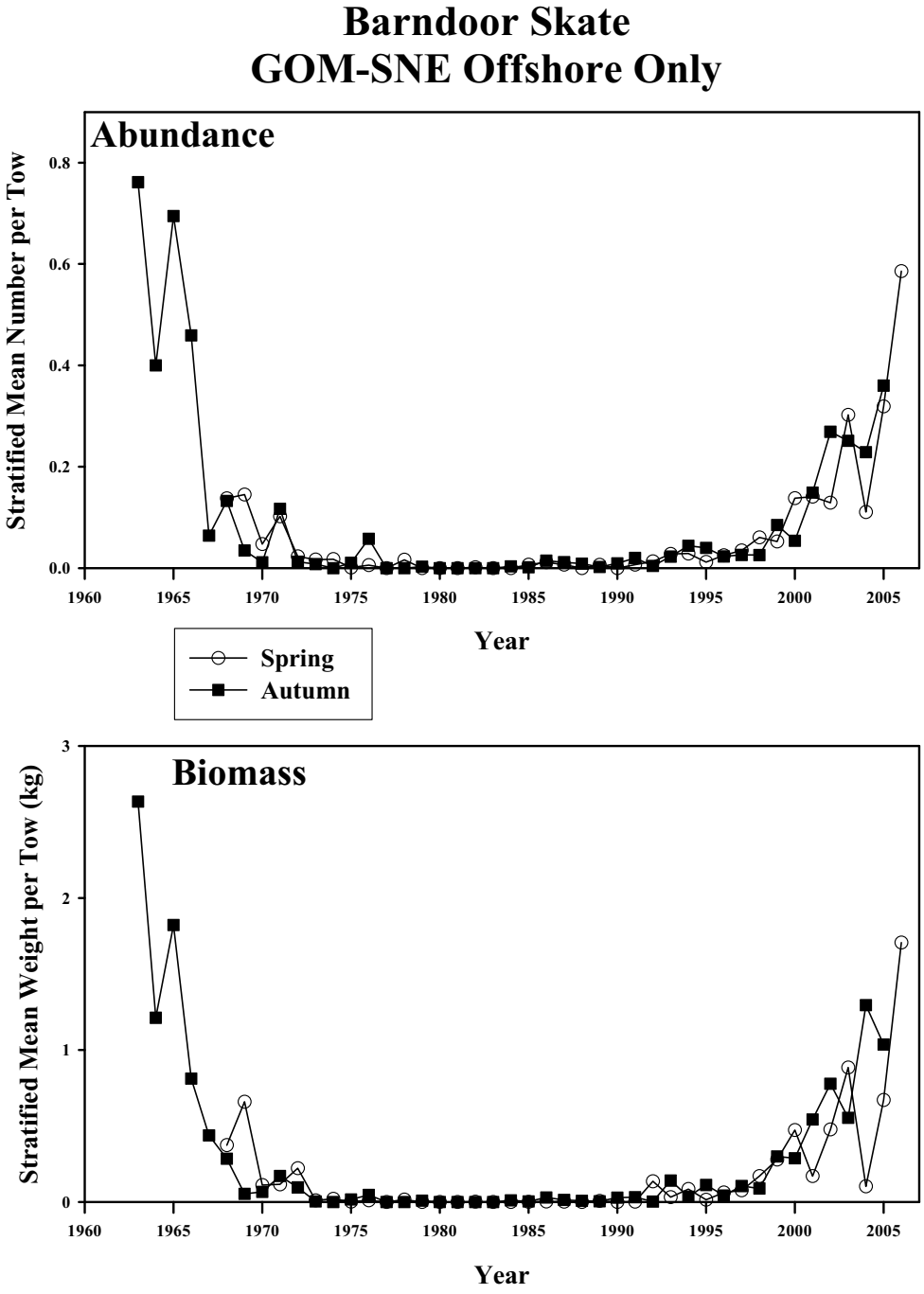


Figure B2.49. Abundance and biomass of barndoor skate from the NESFC spring (circles) and autumn (squares) bottom trawl surveys from 1963-2006 in the Gulf of Maine to Southern New England offshore region.

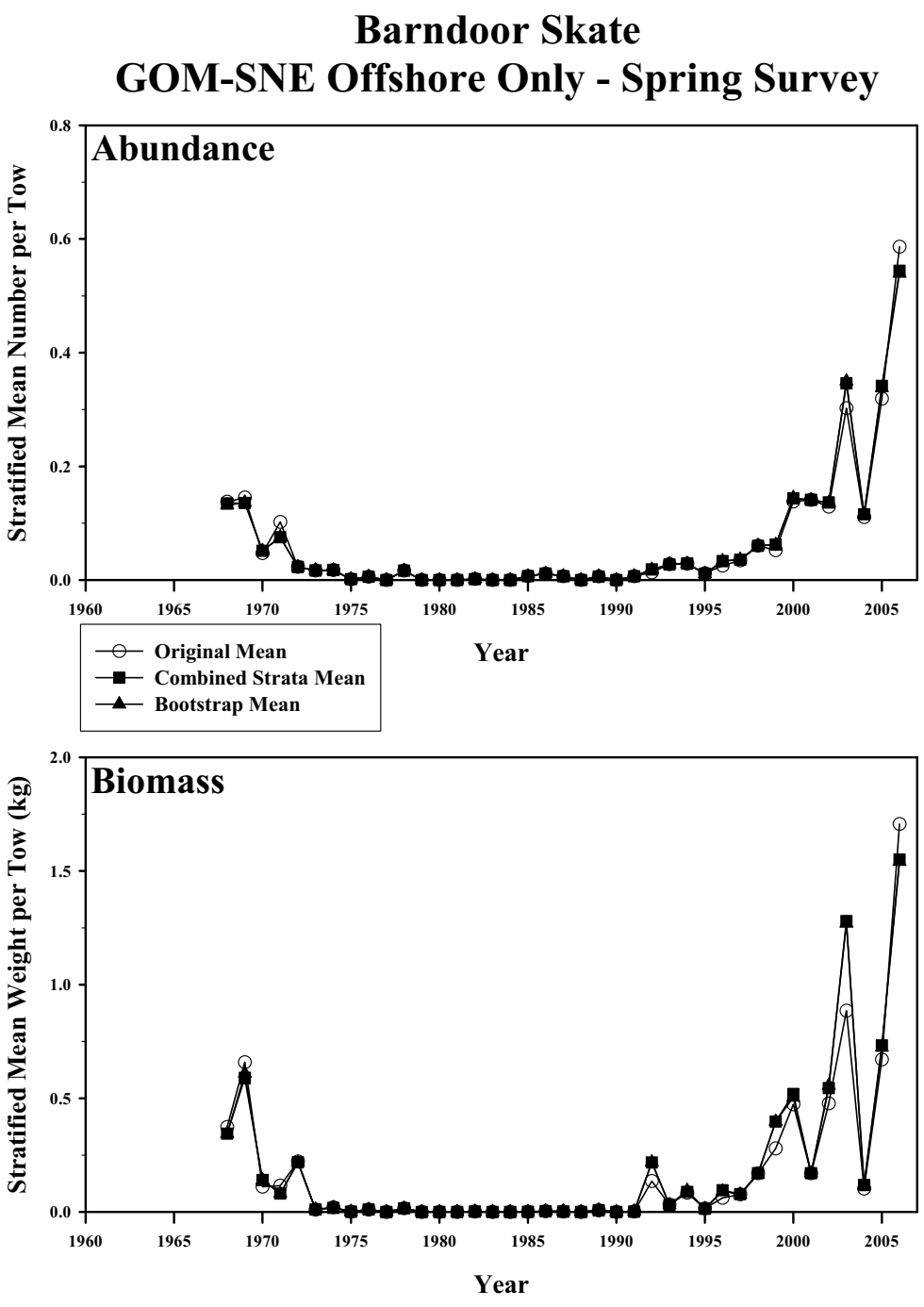


Figure B2.50. Abundance and biomass of barndoor skate from the NESFC spring bottom trawl surveys from 1968-2006 in the Gulf of Maine to Southern New England offshore region. The circles represent the original stratified mean, the squares represent the mean combining strata for bootstrapping, and the triangles represent the bootstrapped mean.

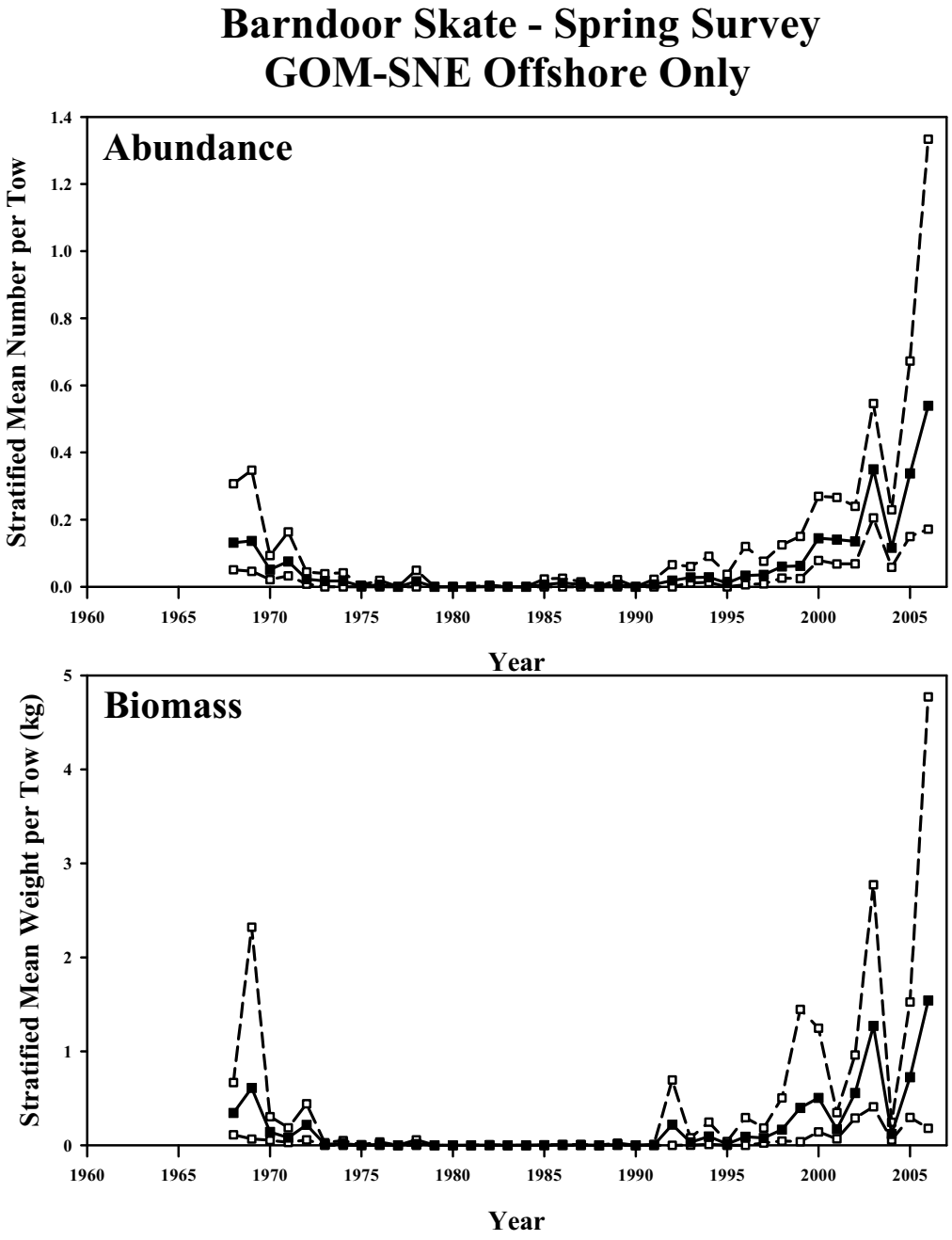


Figure B2.51. Bootstrapped abundance and biomass of barndoor skate from the NESFC spring bottom trawl survey in the Gulf of Maine to Southern New England offshore region. Mean index in solid squares, 95% confidence interval in open squares.

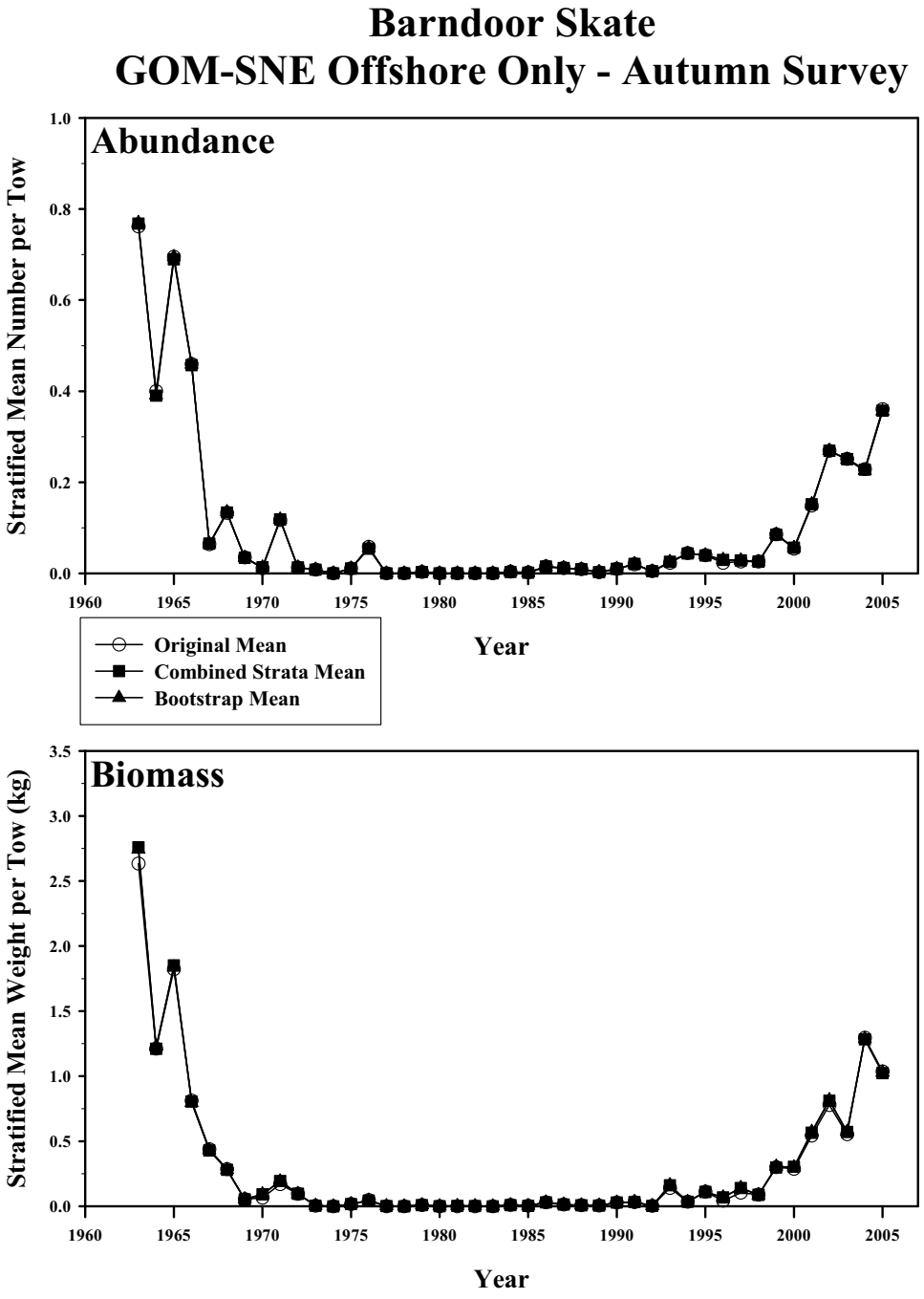


Figure B2.52. Abundance and biomass of barndoor skate from the NESFC autumn bottom trawl surveys from 1963-2006 in the Gulf of Maine to Southern New England offshore region. The circles represent the original stratified mean, the squares represent the mean combining strata for bootstrapping, and the triangles represent the bootstrapped mean.

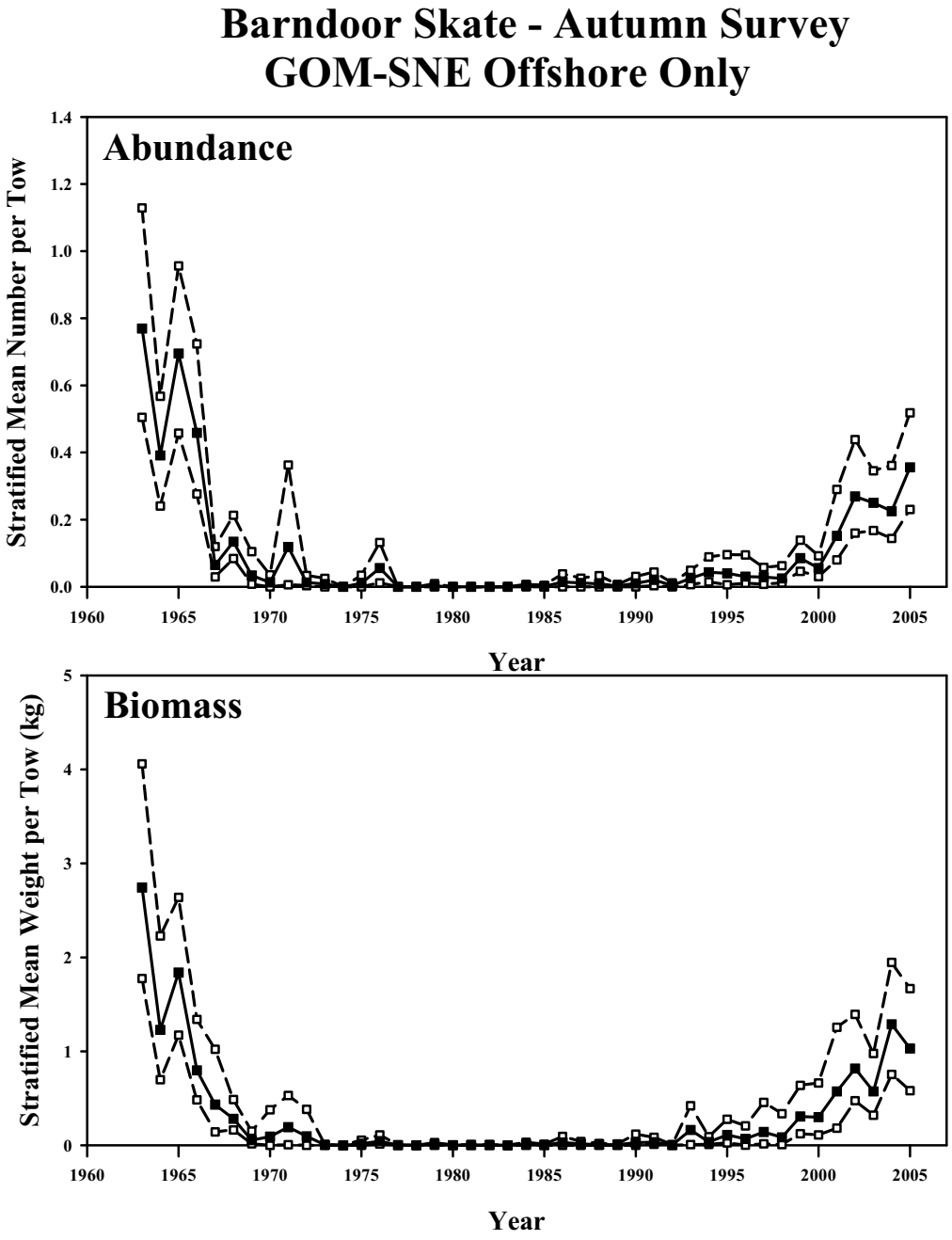


Figure B2.53. Bootstrapped abundance and biomass of barndoor skate from the NESFC autumn bottom trawl survey in the Gulf of Maine to Southern New England offshore region. Mean index in solid squares, 95% confidence interval in open squares.

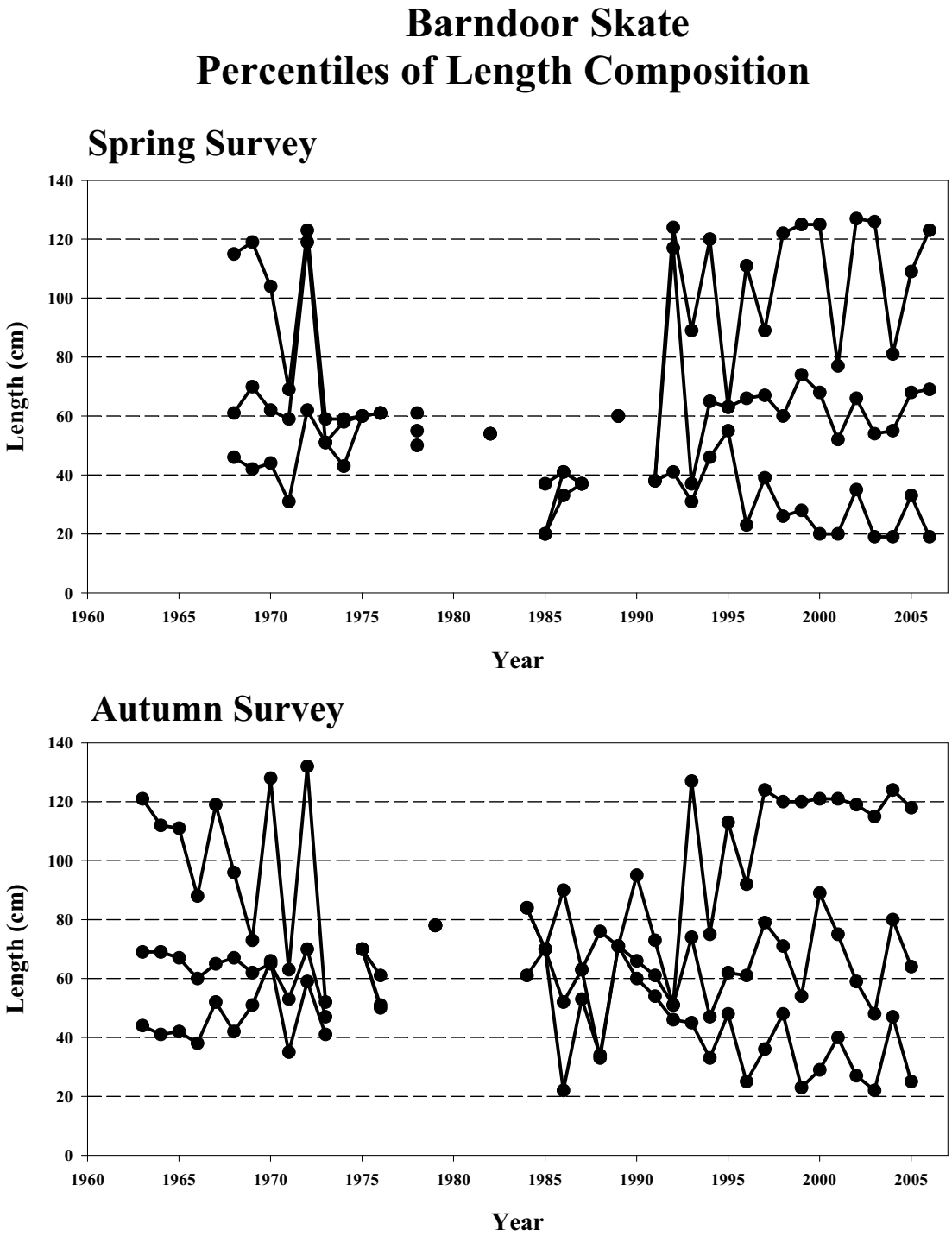


Figure B2.54. Percentiles of length composition (5, 50, and 95) of barndoor skate from the NESFC spring and autumn bottom trawl surveys from 1963-2006 in the Gulf of Maine to Southern New England offshore region.

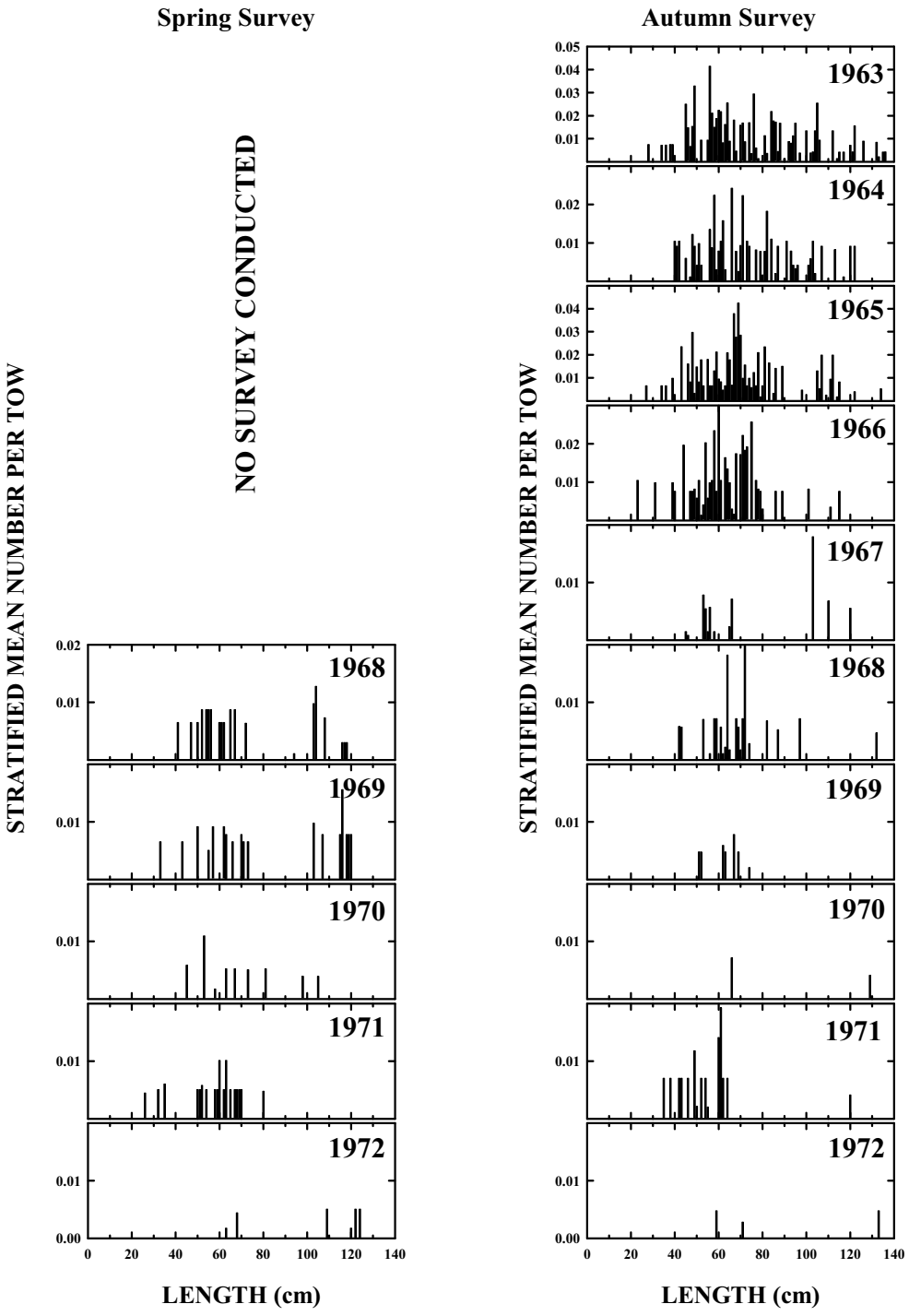


Figure B2.55. Barndoor skate length composition from the NEFSC spring and autumn bottom trawl surveys in the Gulf of Maine to Southern New England offshore region, 1963-1972.

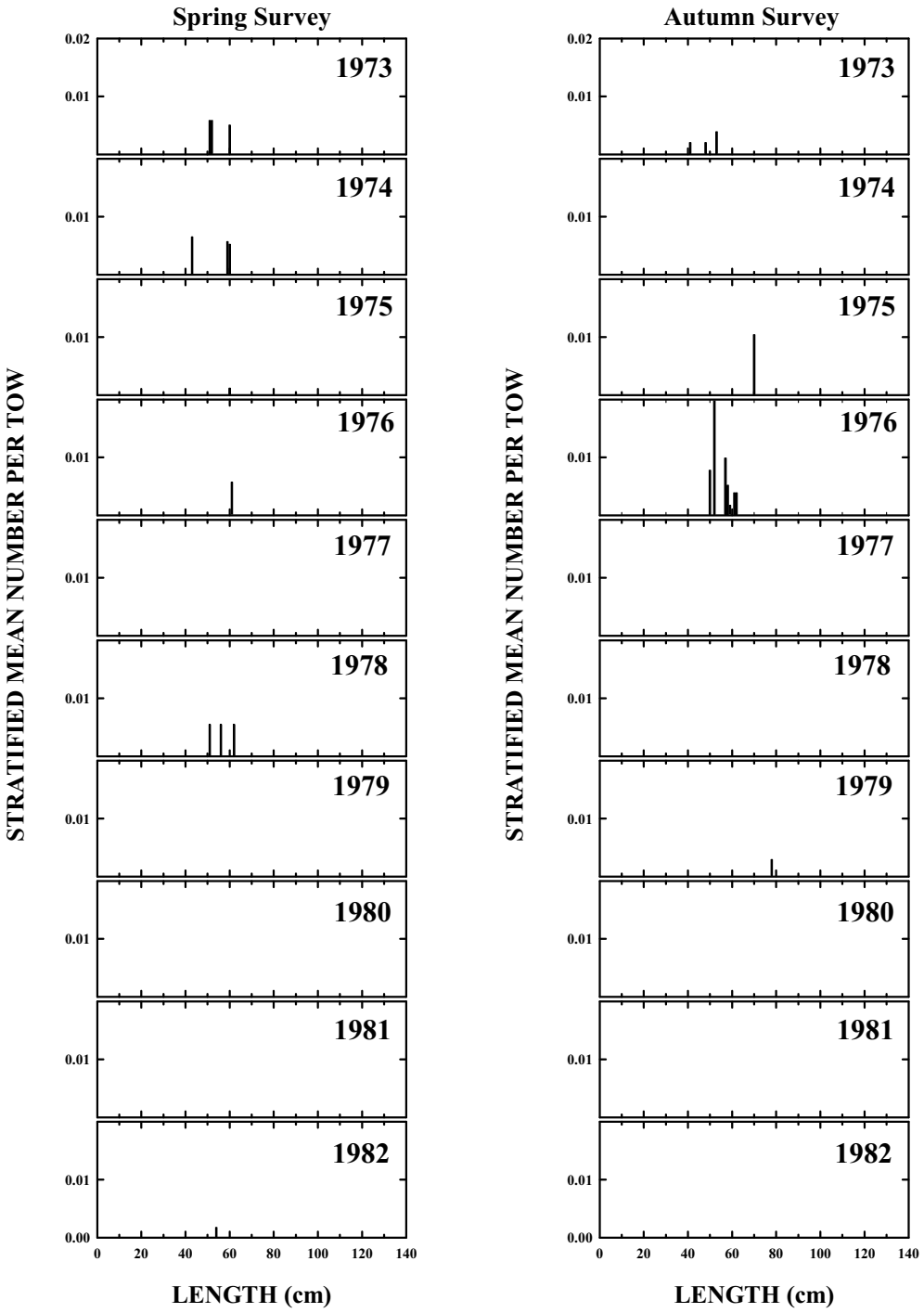


Figure B2.56. Barndoor skate length composition from the NEFSC spring and autumn bottom trawl surveys in the Gulf of Maine to Southern New England offshore region, 1973-1982.

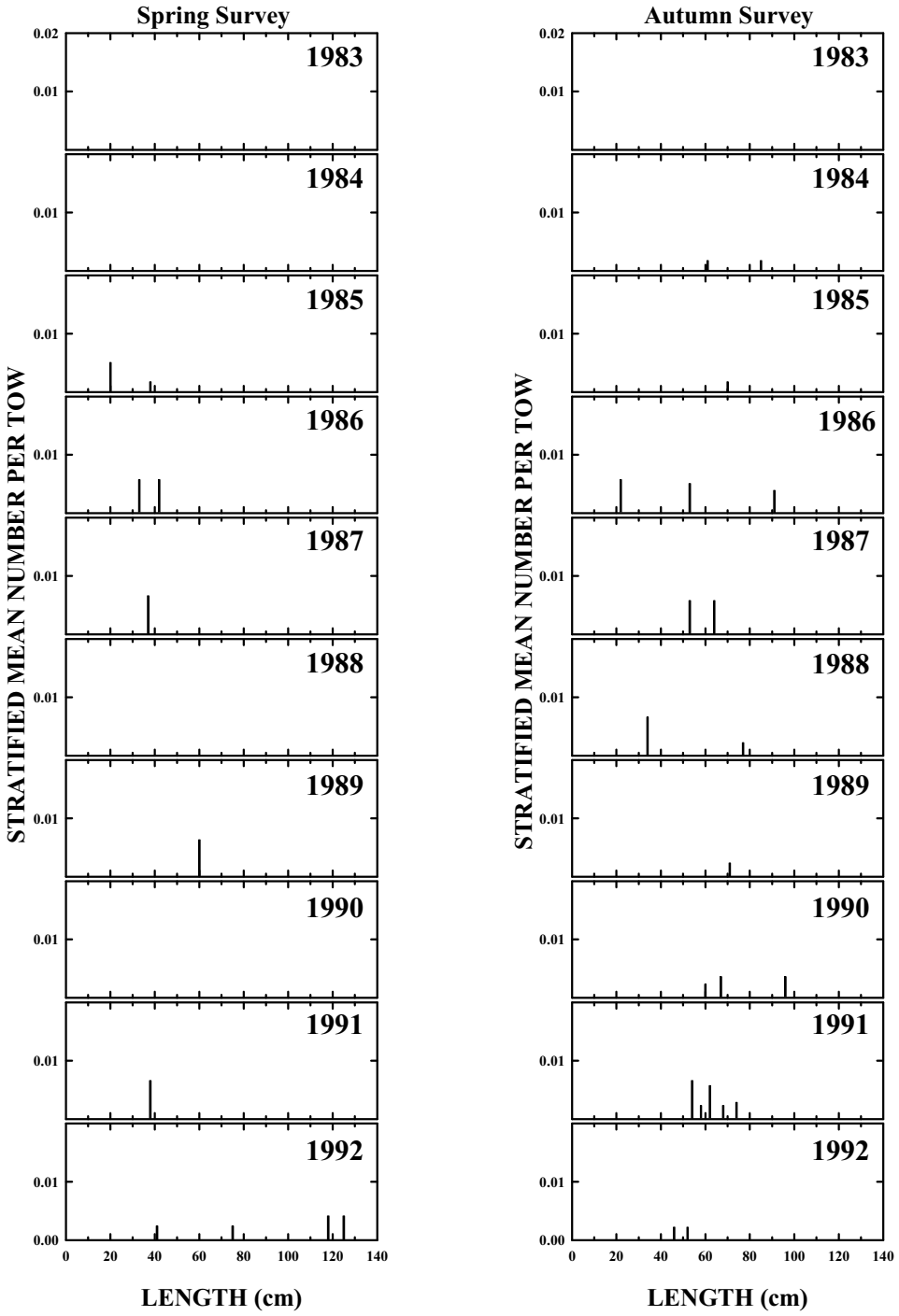


Figure B2.57. Barndoor skate length composition from the NEFSC spring and autumn bottom trawl surveys in the Gulf of Maine to Southern New England offshore region, 1983-1992.

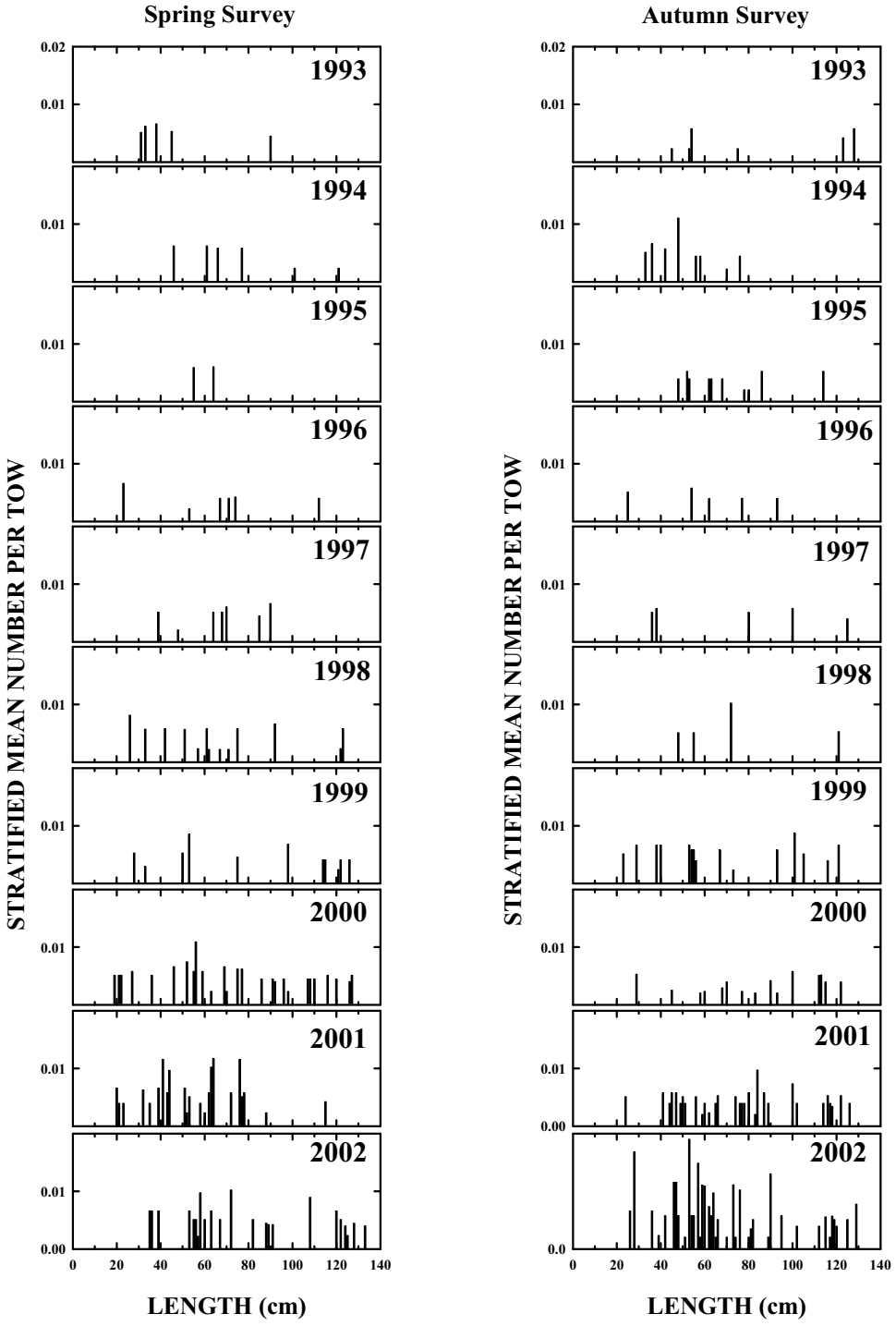


Figure B2.58. Barndoor skate length composition from the NEFSC spring and autumn bottom trawl surveys in the Gulf of Maine to Southern New England offshore region, 1993-2002.

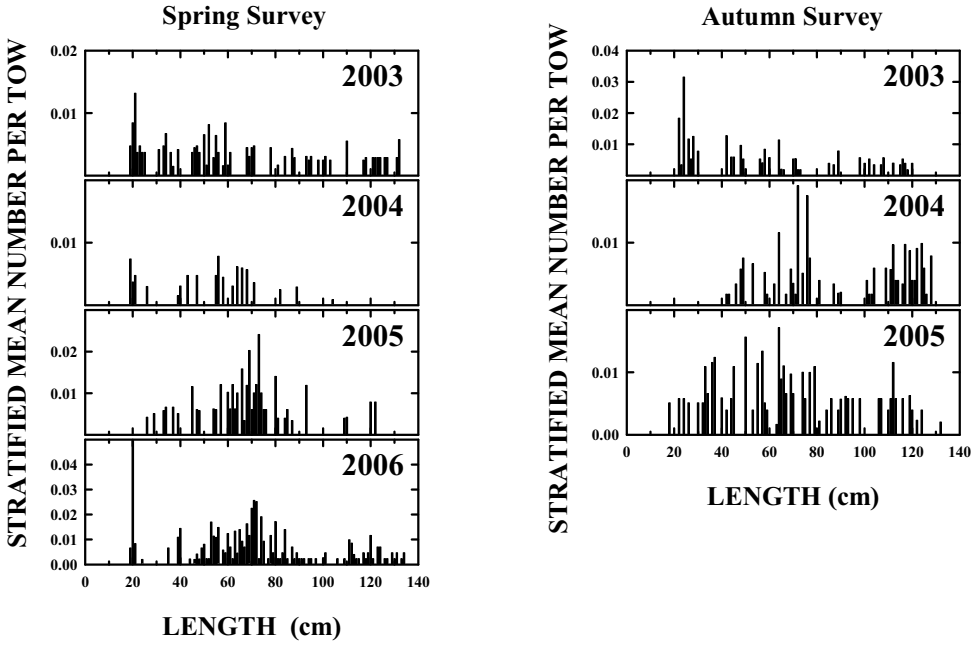


Figure B2.59. Barndoor skate length composition from the NEFSC spring and autumn bottom trawl surveys in the Gulf of Maine to Southern New England offshore region, 2003-2006.

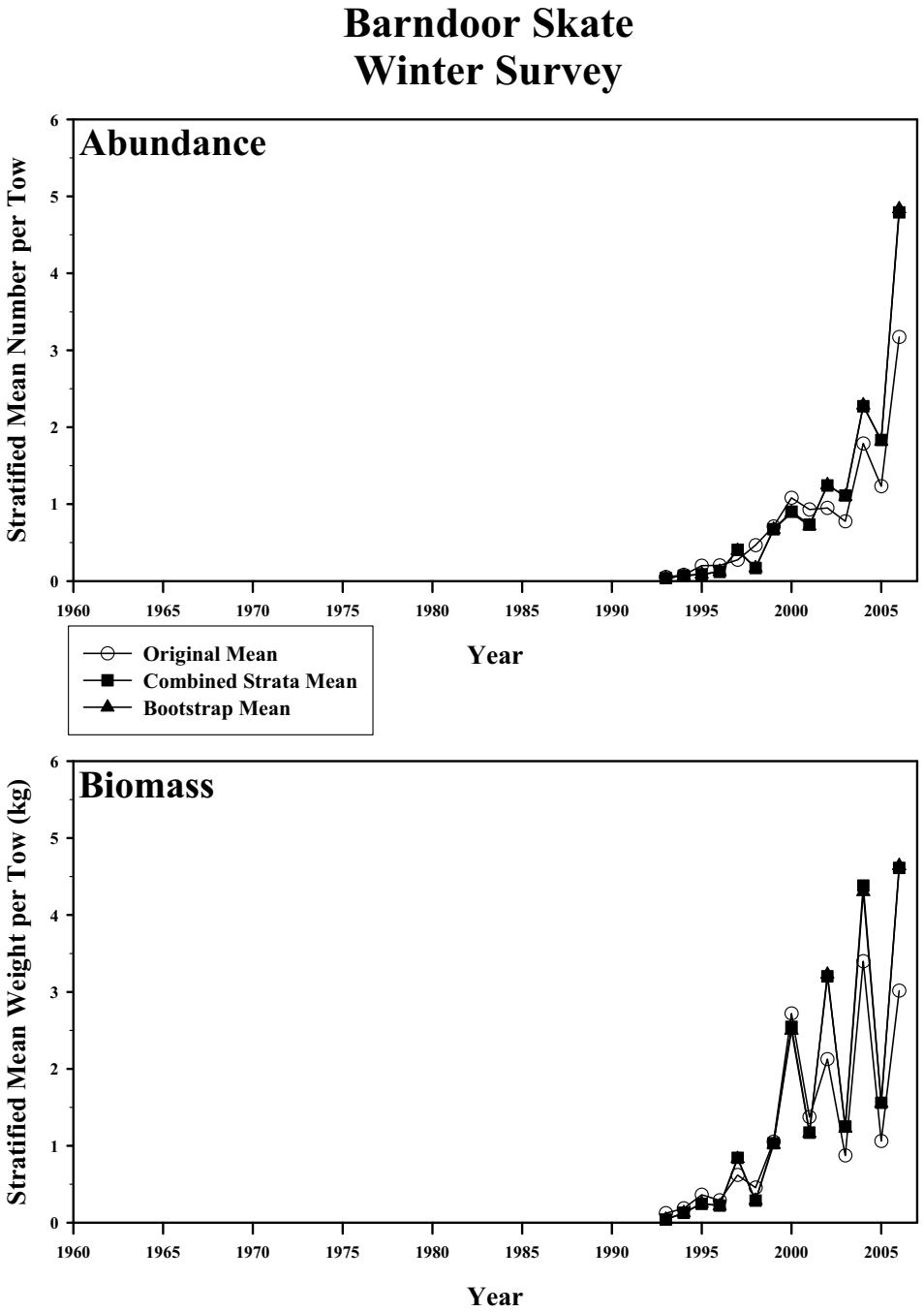


Figure B2.60. Abundance and biomass of barndoor skate from the NESFC winter bottom trawl surveys from 1993-2006. The circles represent the original stratified mean, the squares represent the mean combining strata for bootstrapping, and the triangles represent the bootstrapped mean.

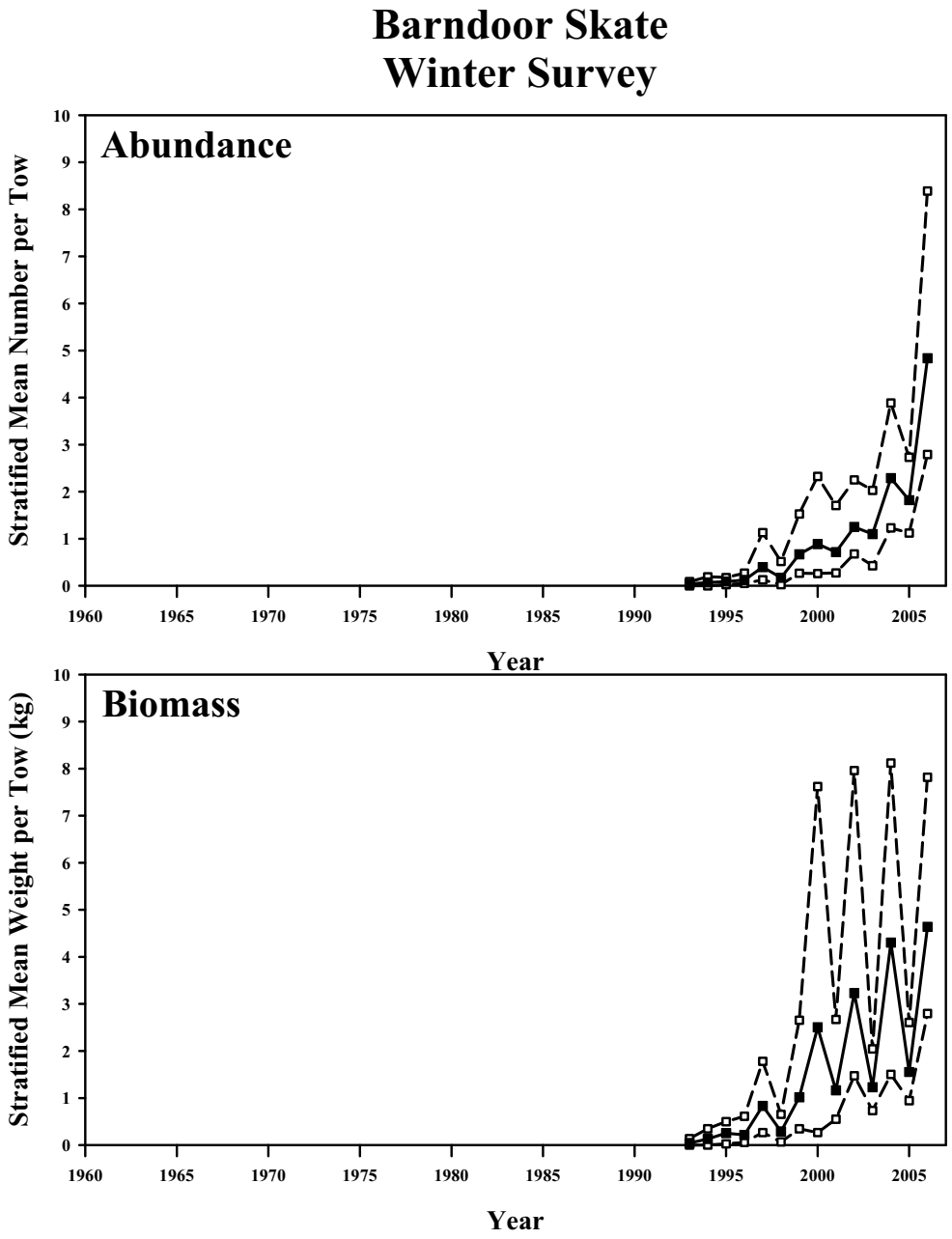


Figure B2.61. Bootstrapped abundance and biomass of barndoor skate from the NESFC winter bottom trawl survey. Mean index in solid squares, 95% confidence interval in open squares.

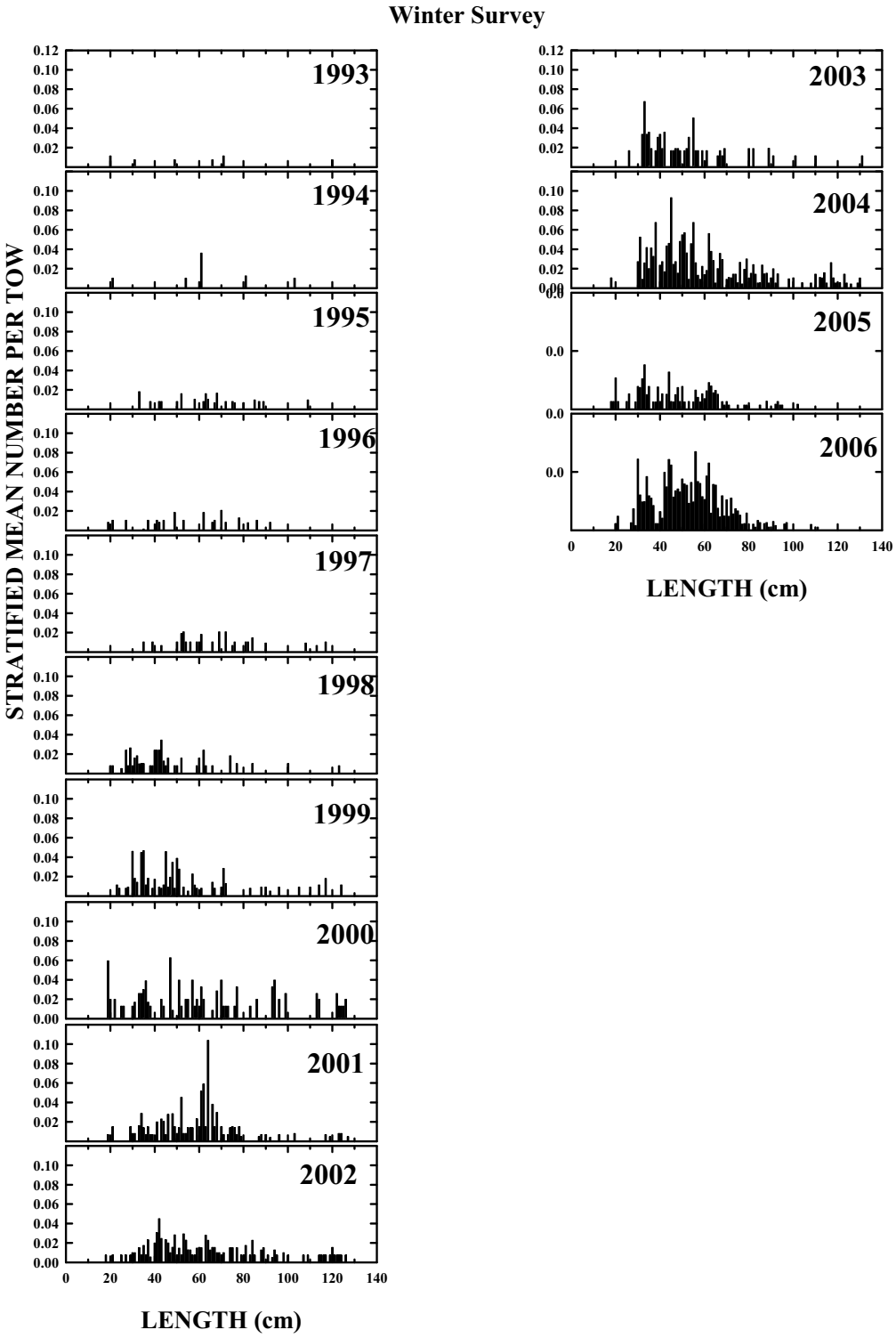


Figure B2.62. Barndoor skate length composition from the NEFSC winter flatfish surveys, 1993-2006.

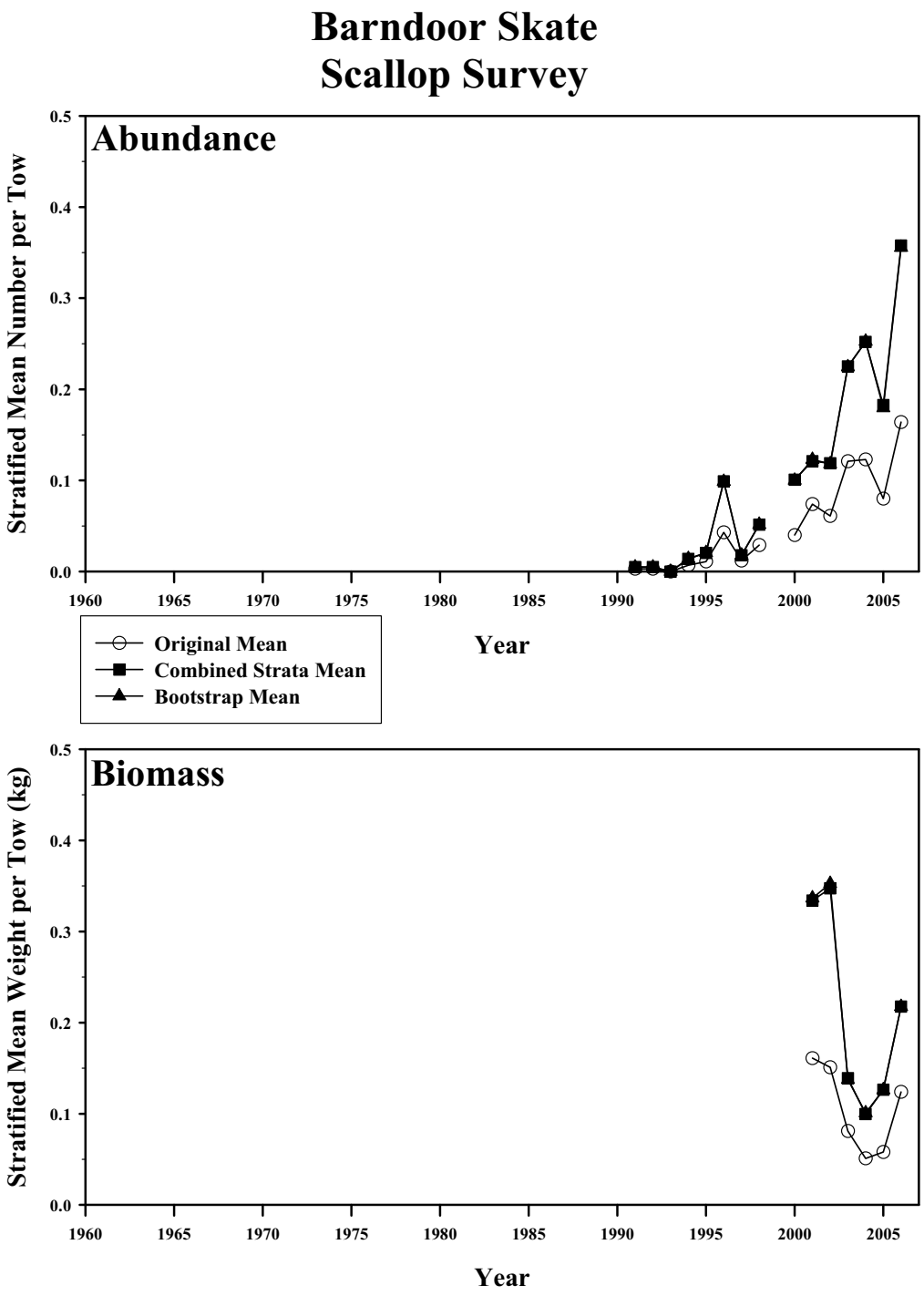


Figure B2.63. Abundance and biomass of barndoor skate from the NESFC scallop surveys from 1991-2006. The circles represent the original stratified mean, the squares represent the mean combining strata for bootstrapping, and the triangles represent the bootstrapped mean.

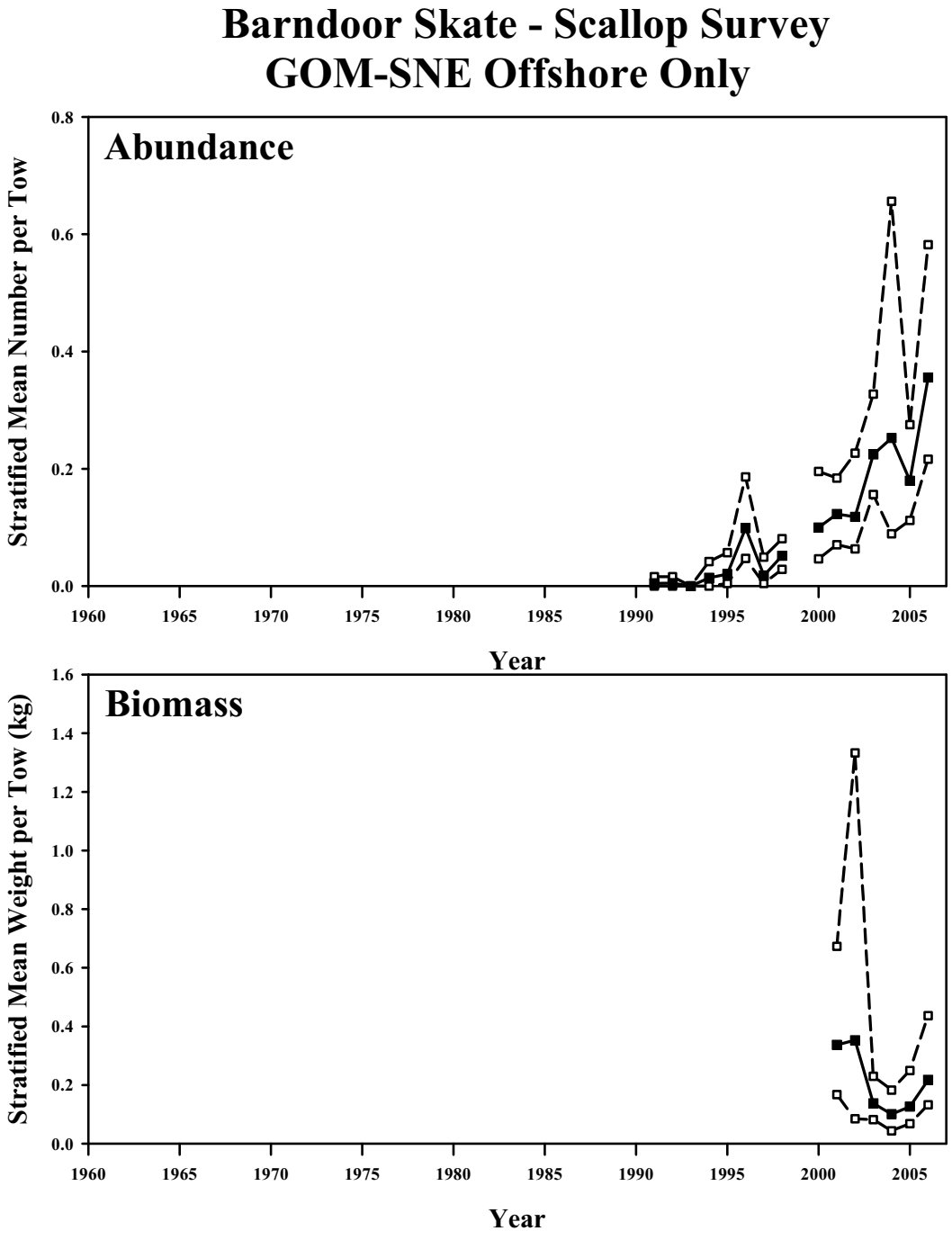


Figure B2.64. Bootstrapped abundance and biomass of barndoor skate from the NESFC scallop survey. Mean index in solid squares, 95% confidence interval in open squares.

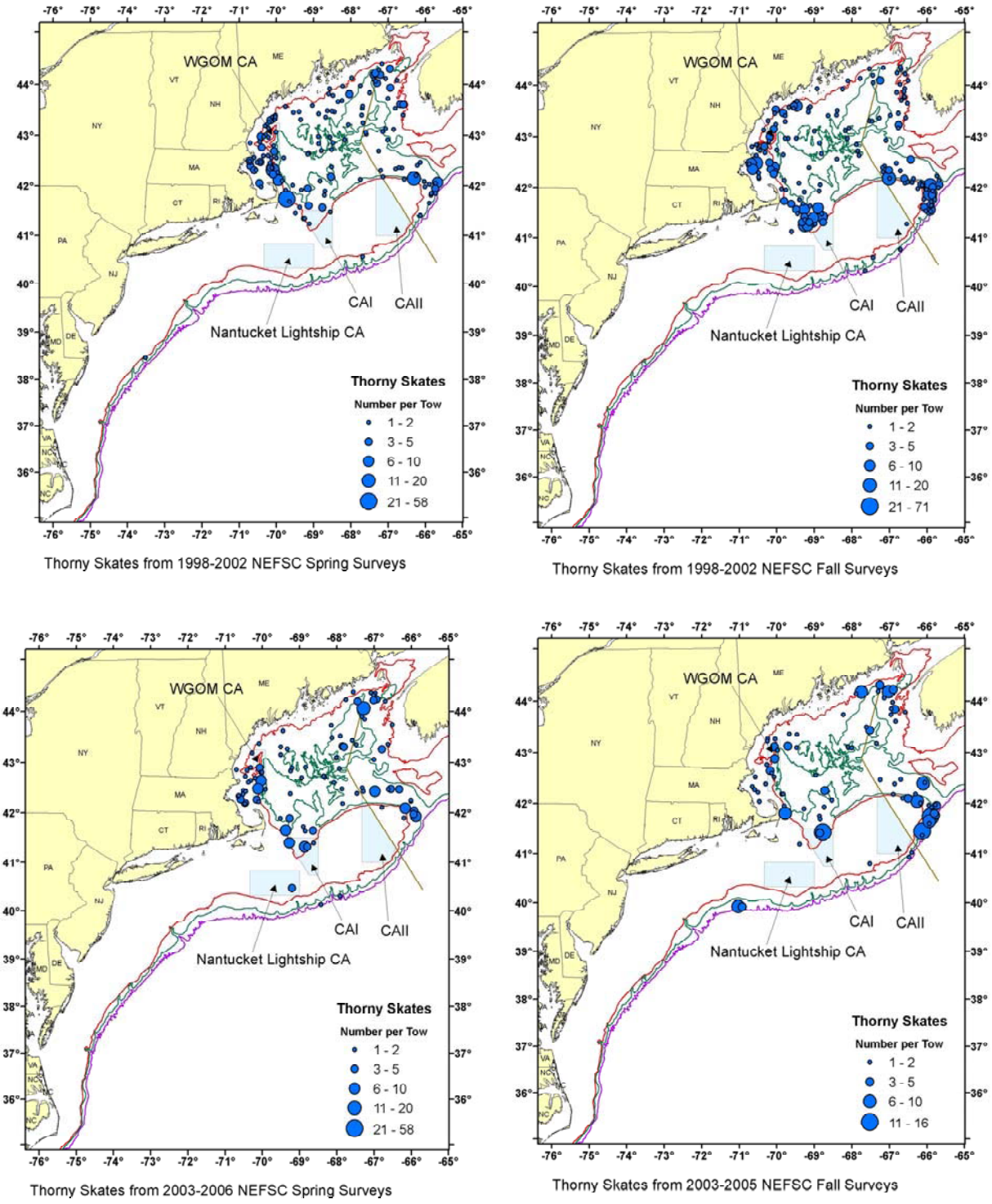


Figure B2.65. Distribution of thorny skate from the spring and autumn NEFSC surveys from 1998-2006.

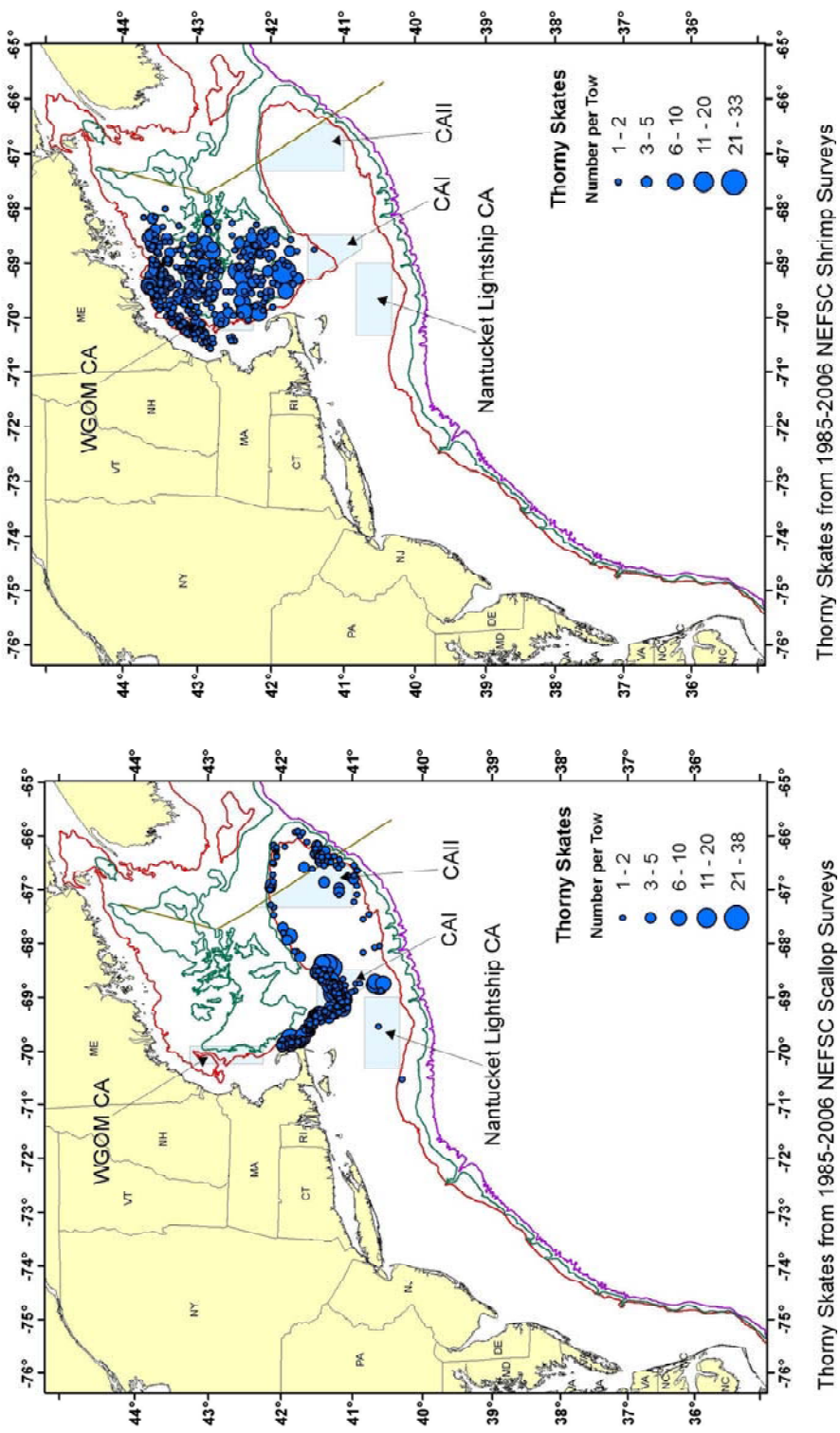


Figure B2.66. Distribution of thorny skate from the NEFSC scallop and shrimp surveys from 1985-2006.

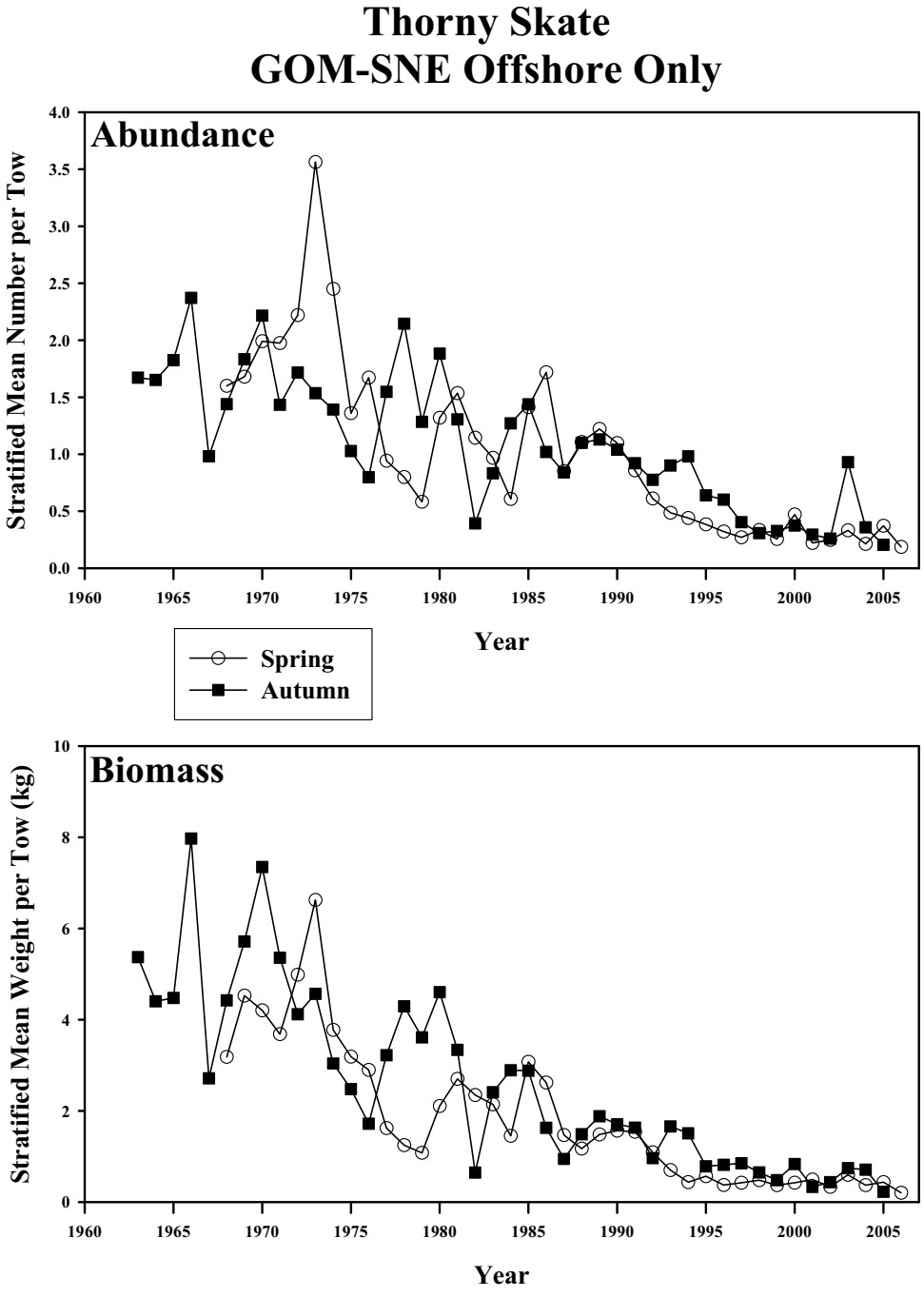


Figure B2.67. Abundance and biomass of thorny skate from the NESFC spring (circles) and autumn (squares) bottom trawl surveys from 1963-2006 in the Gulf of Maine to Southern New England offshore region.

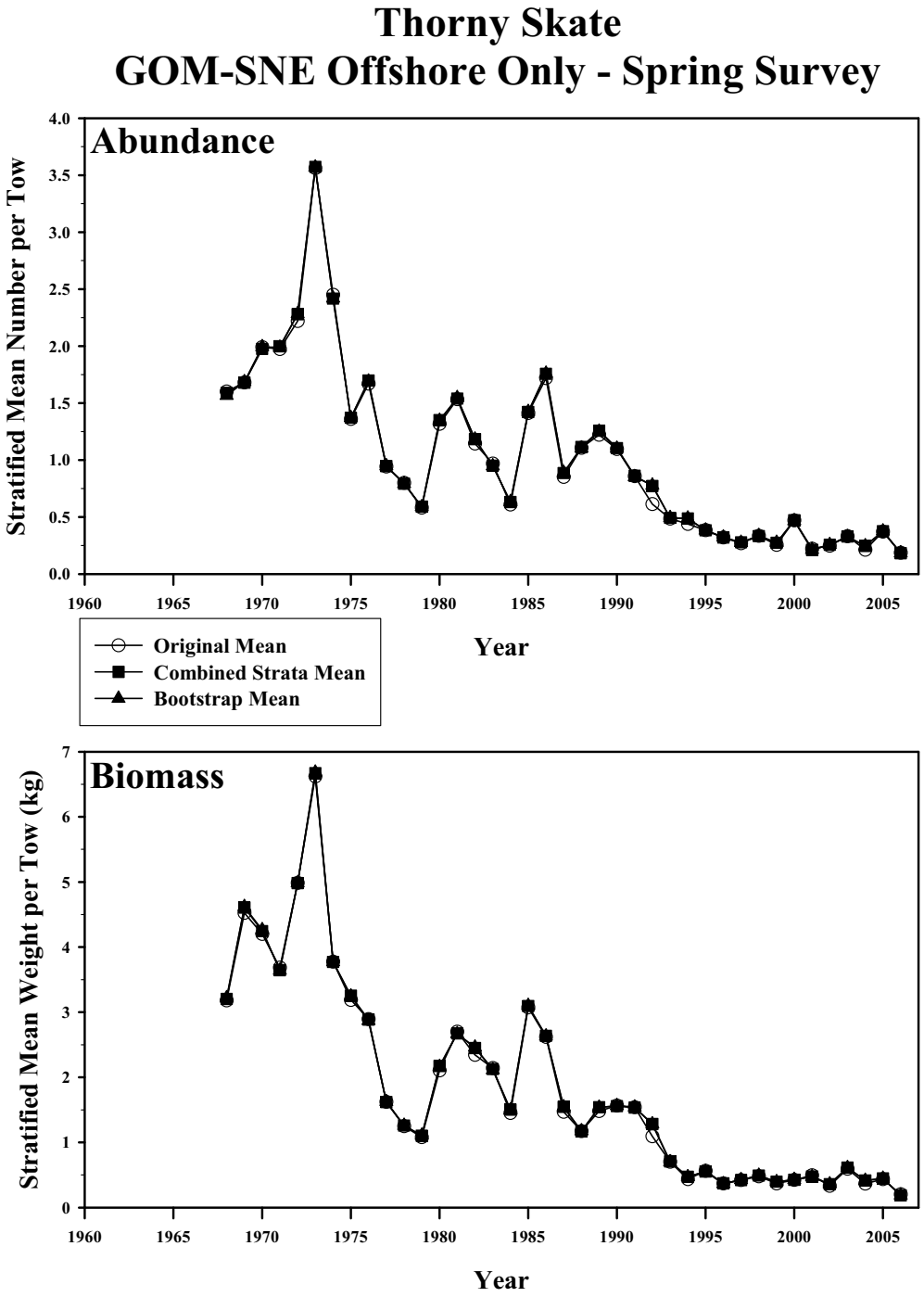


Figure B2.68. Abundance and biomass of thorny skate from the NESFC spring bottom trawl surveys from 1968-2006 in the Gulf of Maine to Southern New England offshore region. The circles represent the original stratified mean, the squares represent the mean combining strata for bootstrapping, and the triangles represent the bootstrapped mean.

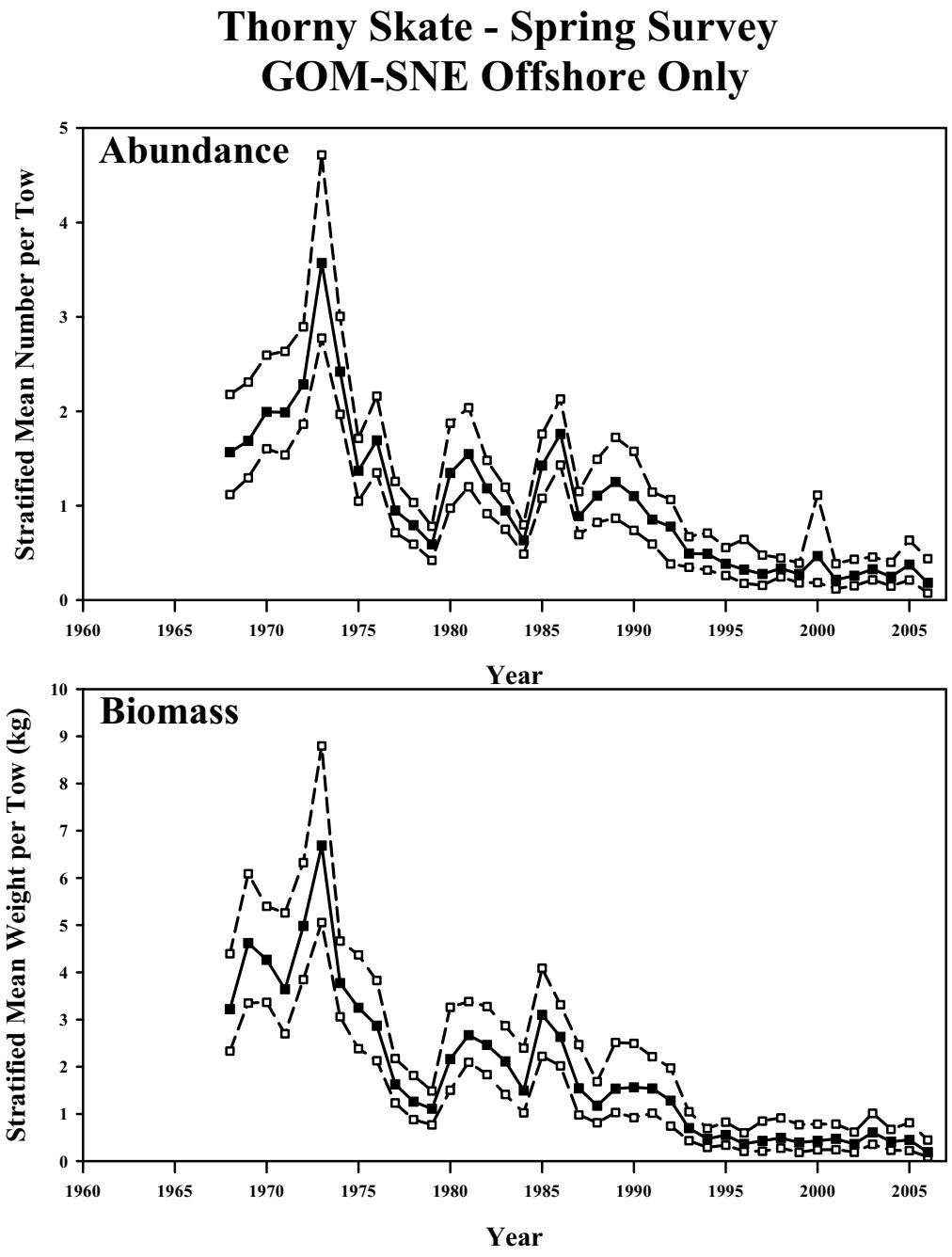


Figure B2.69. Bootstrapped abundance and biomass of thorny skate from the NESFC spring bottom trawl survey in the Gulf of Maine to Southern New England offshore region. Mean index in solid squares, 95% confidence interval in open squares.

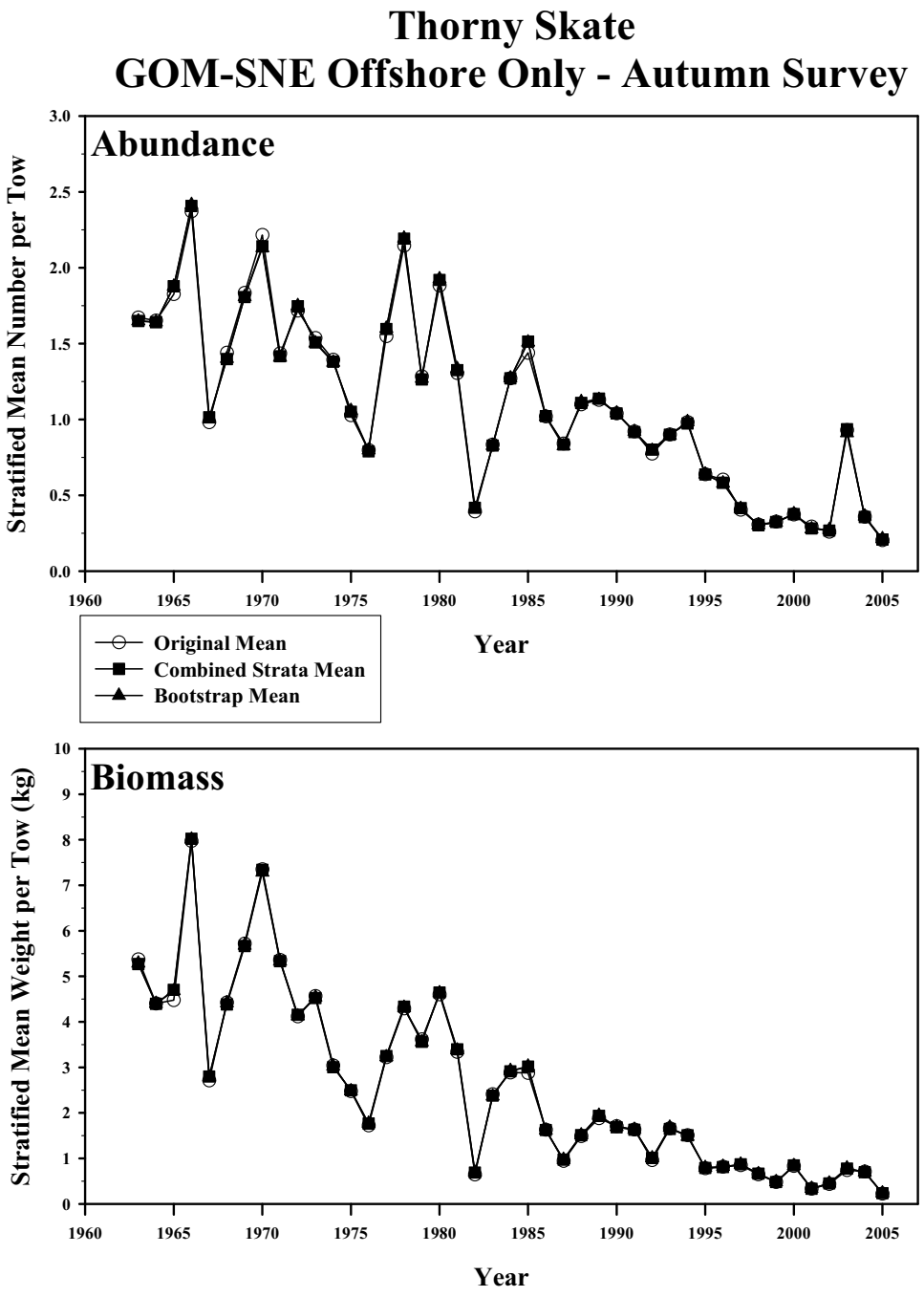


Figure B2.70. Abundance and biomass of thorny skate from the NESFC autumn bottom trawl surveys from 1968-2006 in the Gulf of Maine to Southern New England offshore region. The circles represent the original stratified mean, the squares represent the mean combining strata for bootstrapping, and the triangles represent the bootstrapped mean.

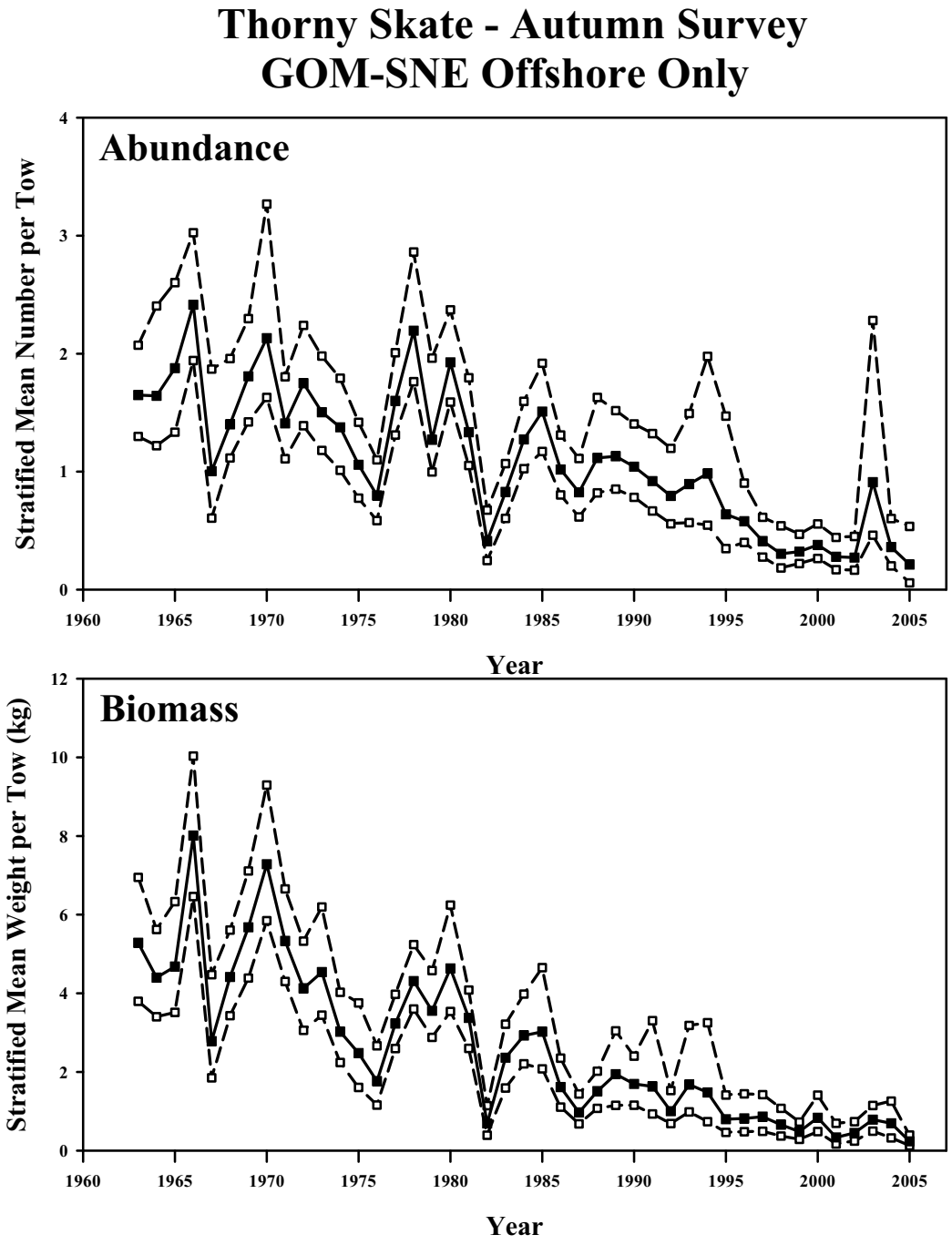


Figure B2.71. Bootstrapped abundance and biomass of thorny skate from the NESFC autumn bottom trawl survey in the Gulf of Maine to Southern New England offshore region. Mean index in solid squares, 95% confidence interval in open squares.

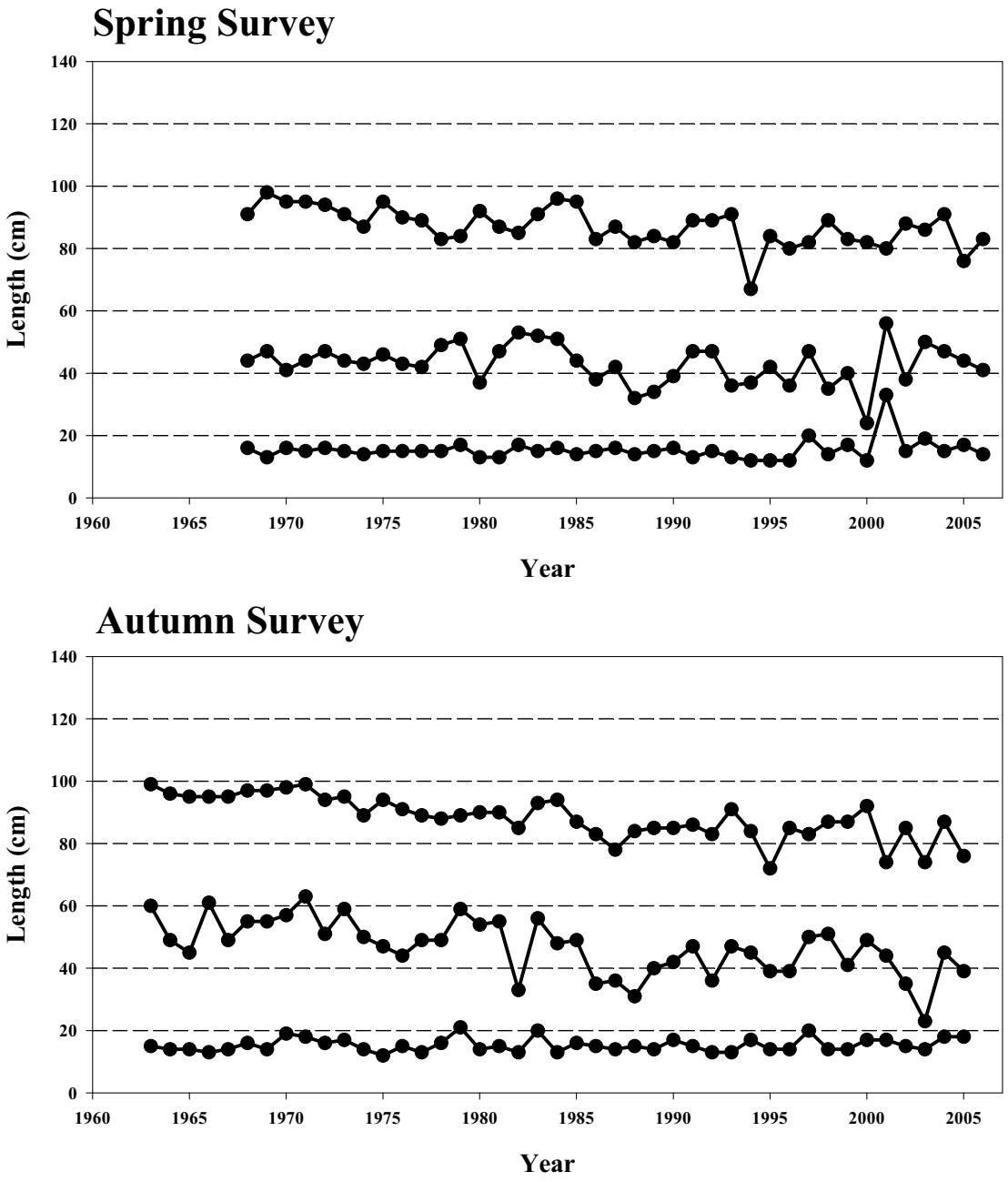


Figure B2.72. Percentiles of length composition (5, 50, and 95) of thorny skate from the NESFC spring and autumn bottom trawl surveys from 1963-2006 in the Gulf of Maine to Southern New England offshore region.

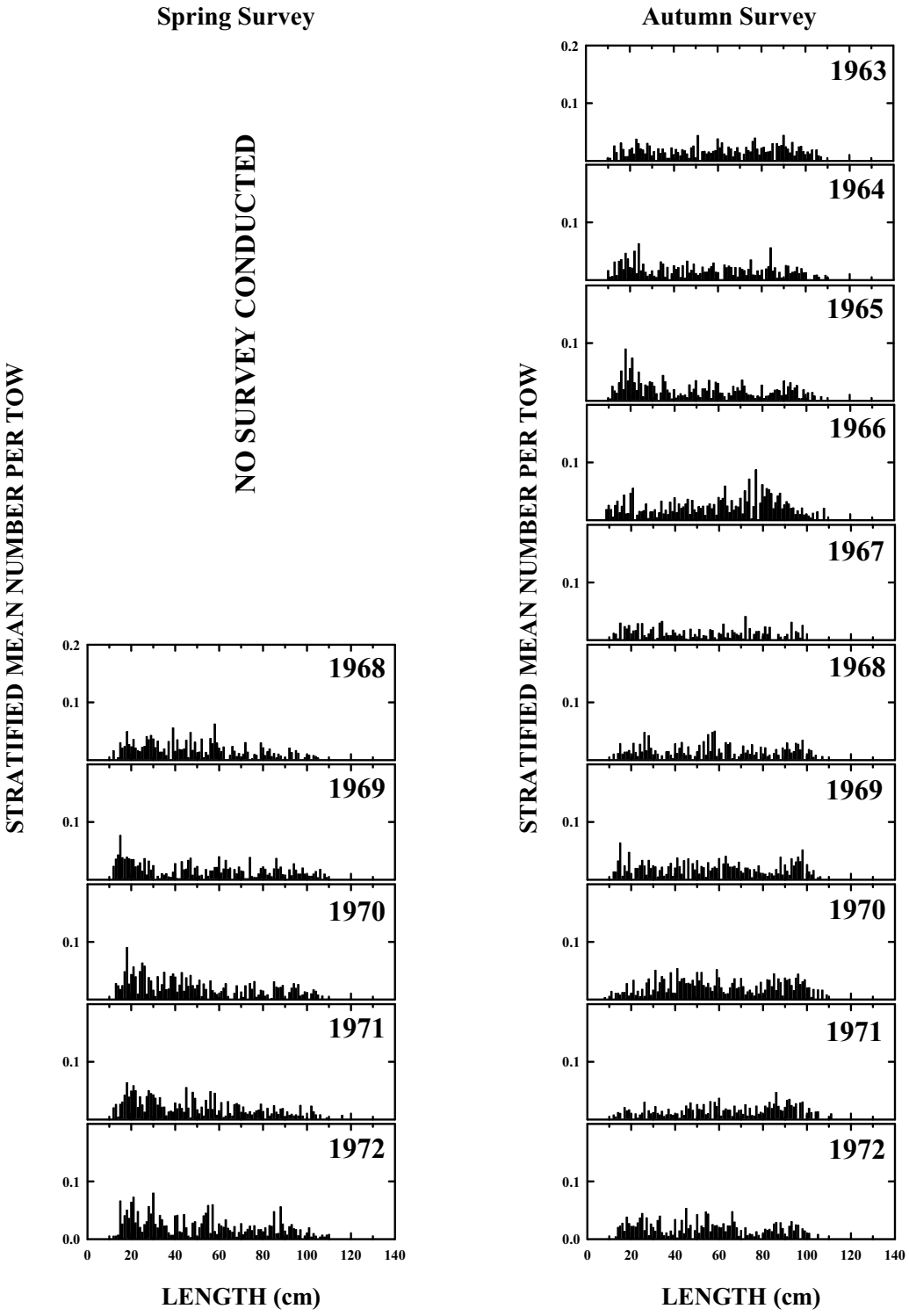


Figure B2.73. Thorny skate length composition from the NEFSC spring and autumn bottom trawl surveys in the Gulf of Maine to Southern New England offshore region, 1963-1972.

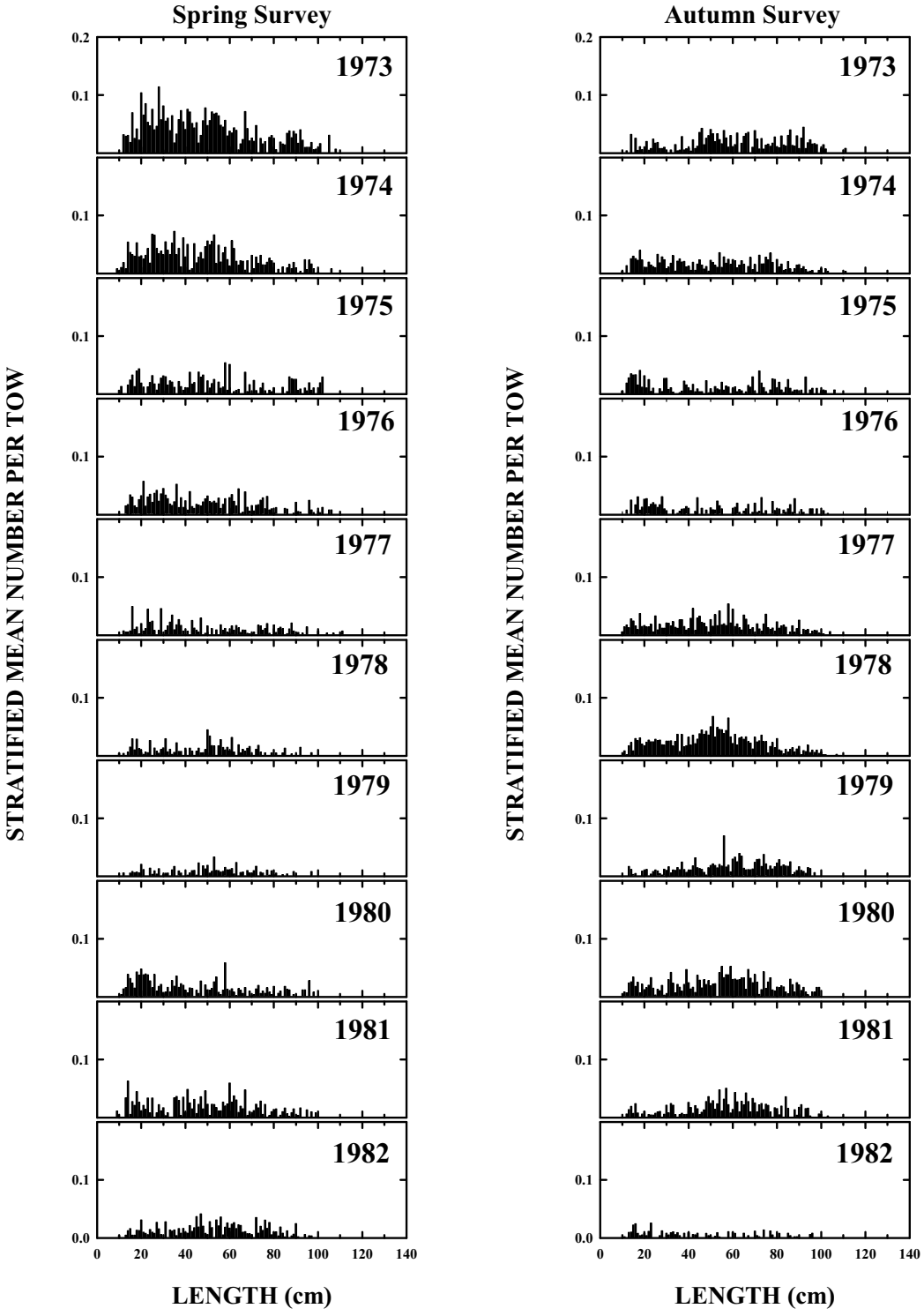


Figure B2.74. Thorny skate length composition from the NEFSC spring and autumn bottom trawl surveys in the Gulf of Maine to Southern New England offshore region, 1973-1982.

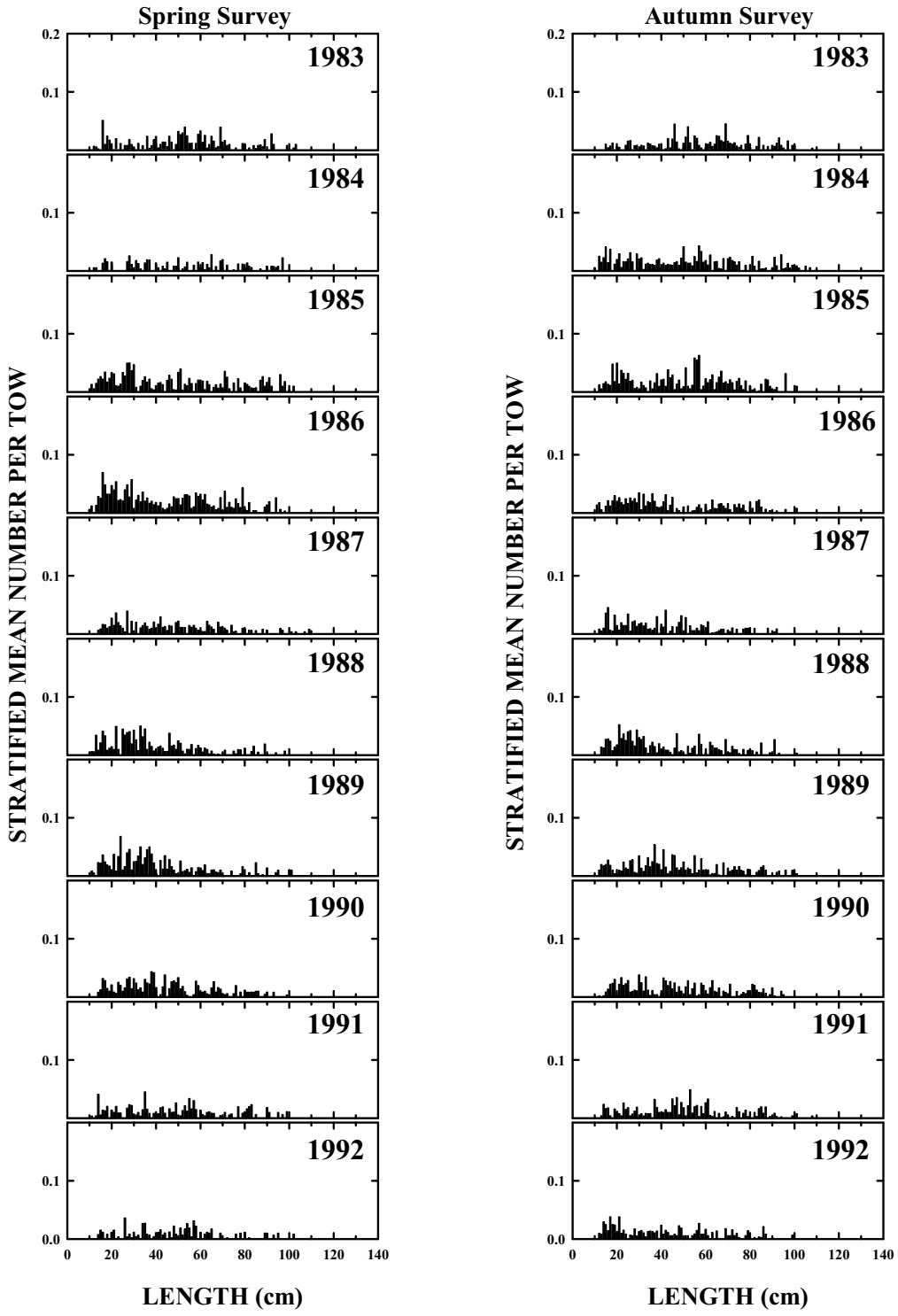


Figure B2.75. Thorny skate length composition from the NEFSC spring and autumn bottom trawl surveys in the Gulf of Maine to Southern New England offshore region, 1983-1992.

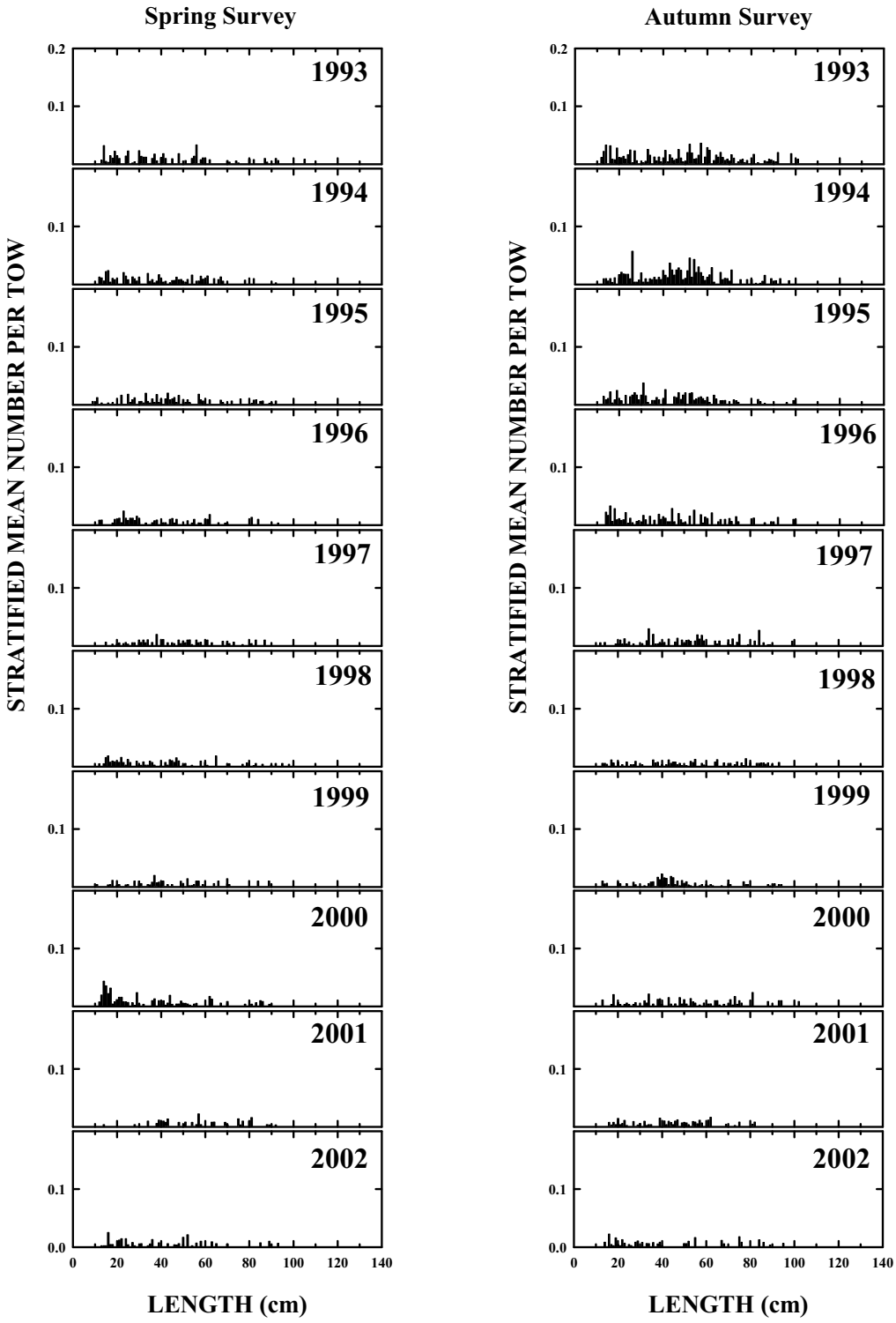


Figure B2.76. Thorny skate length composition from the NEFSC spring and autumn bottom trawl surveys in the Gulf of Maine to Southern New England offshore region, 1993-2002.

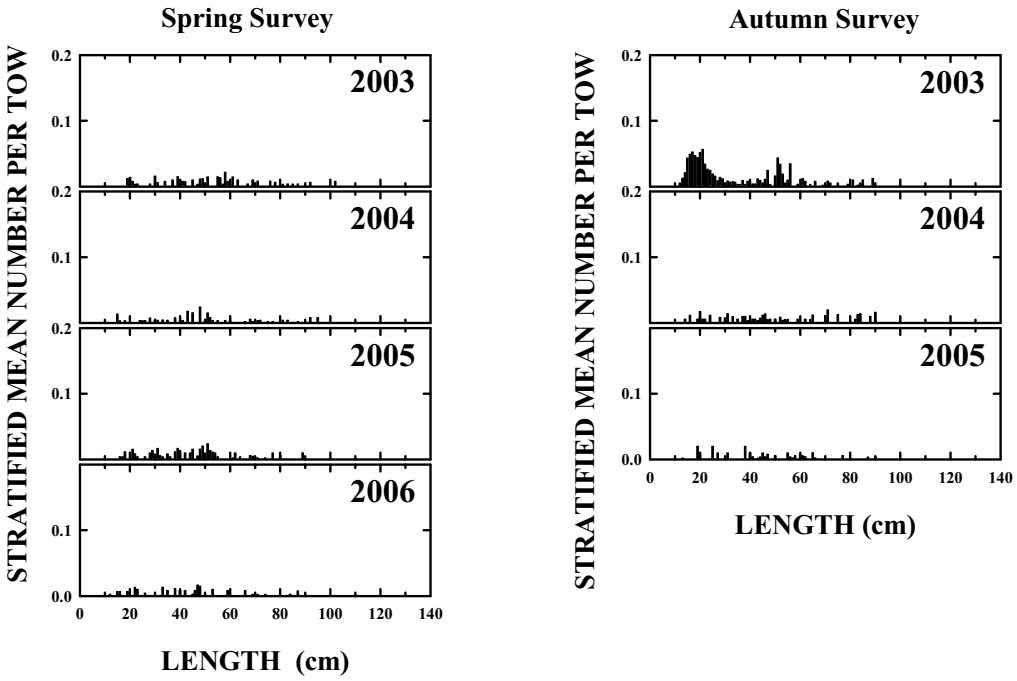


Figure B2.77. Thorny skate length composition from the NEFSC spring and autumn bottom trawl surveys in the Gulf of Maine to Southern New England offshore region, 2003-2006.

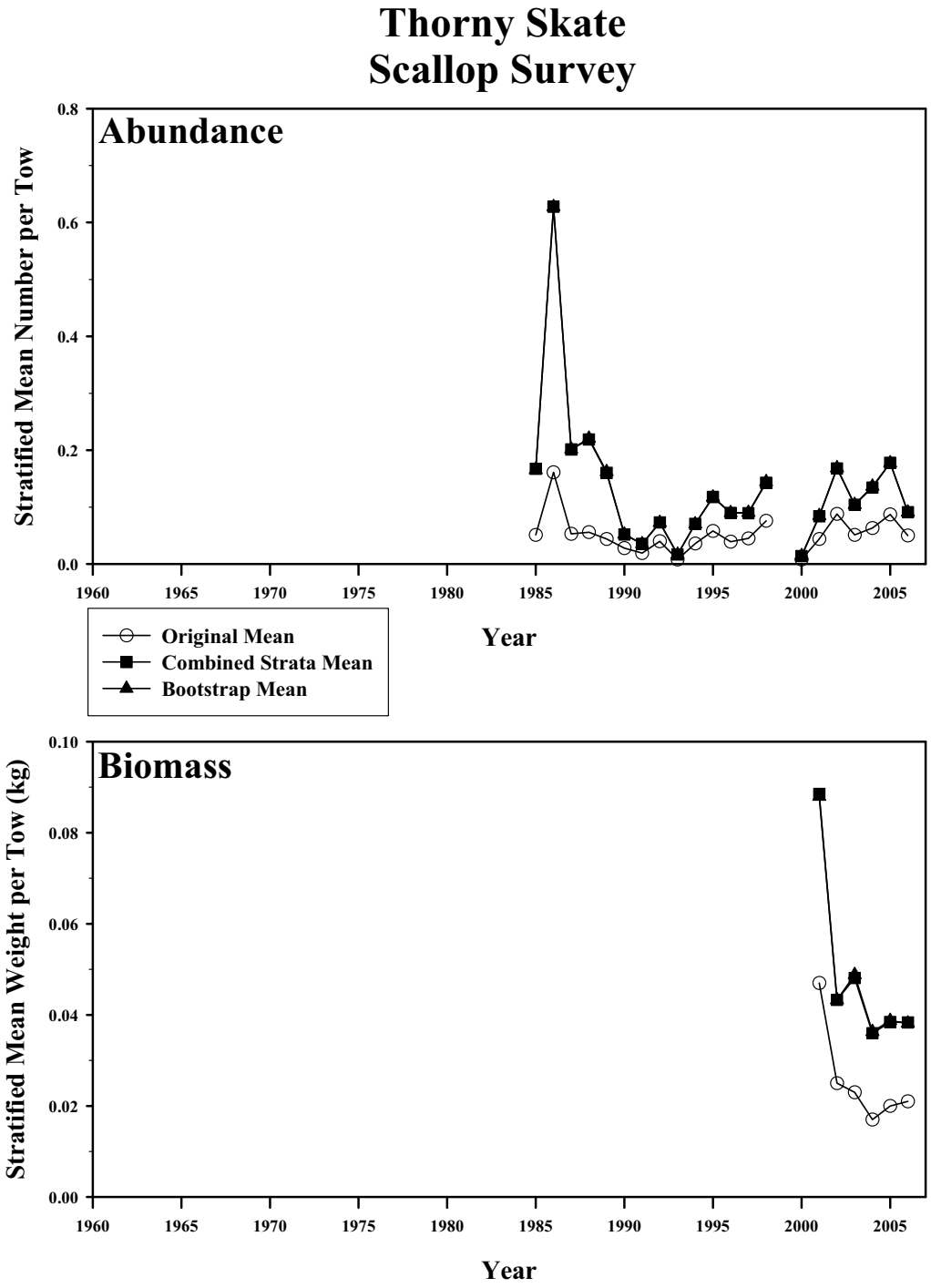


Figure B2.78. Abundance and biomass of thorny skate from the NESFC scallop surveys from 1985-2006. The circles represent the original stratified mean, the squares represent the mean combining strata for bootstrapping, and the triangles represent the bootstrapped mean.

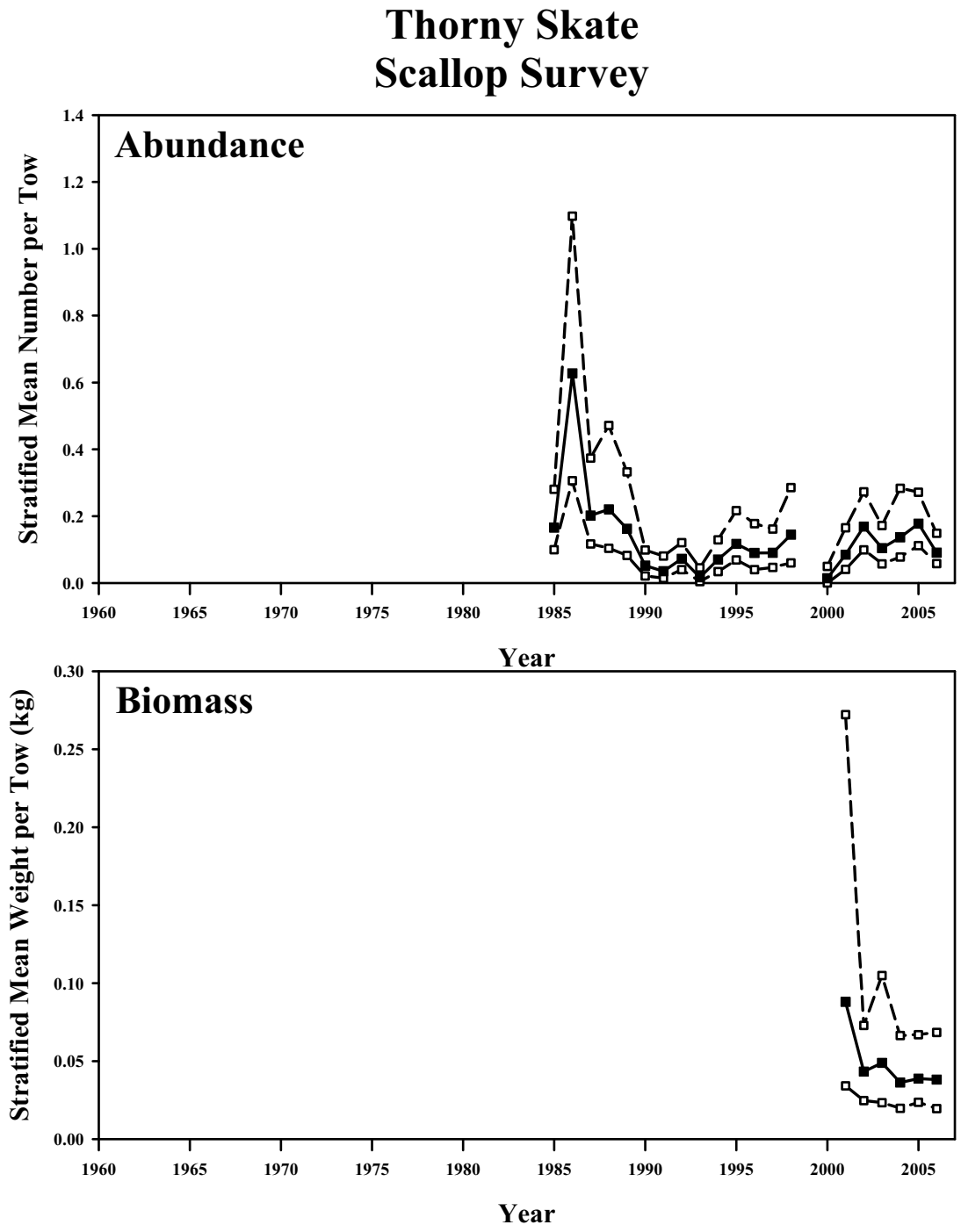


Figure B2.79. Bootstrapped abundance and biomass of thorny skate from the NESFC scallop survey. Mean index in solid squares, 95% confidence interval in open squares.

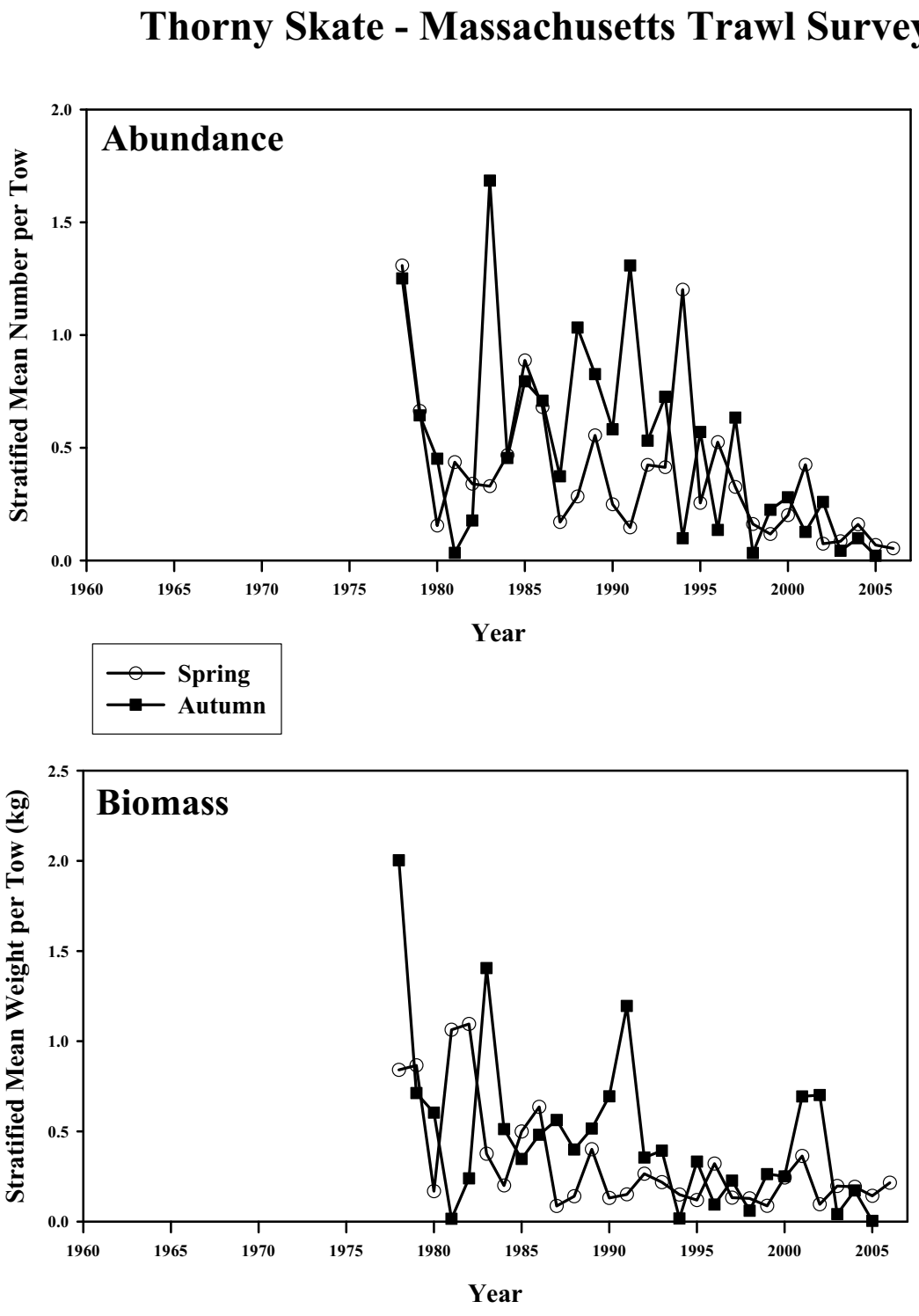


Figure B2.80. Abundance and biomass of thorny skate from the Massachusetts spring and autumn finfish bottom trawl survey in state waters (strata 25-36).

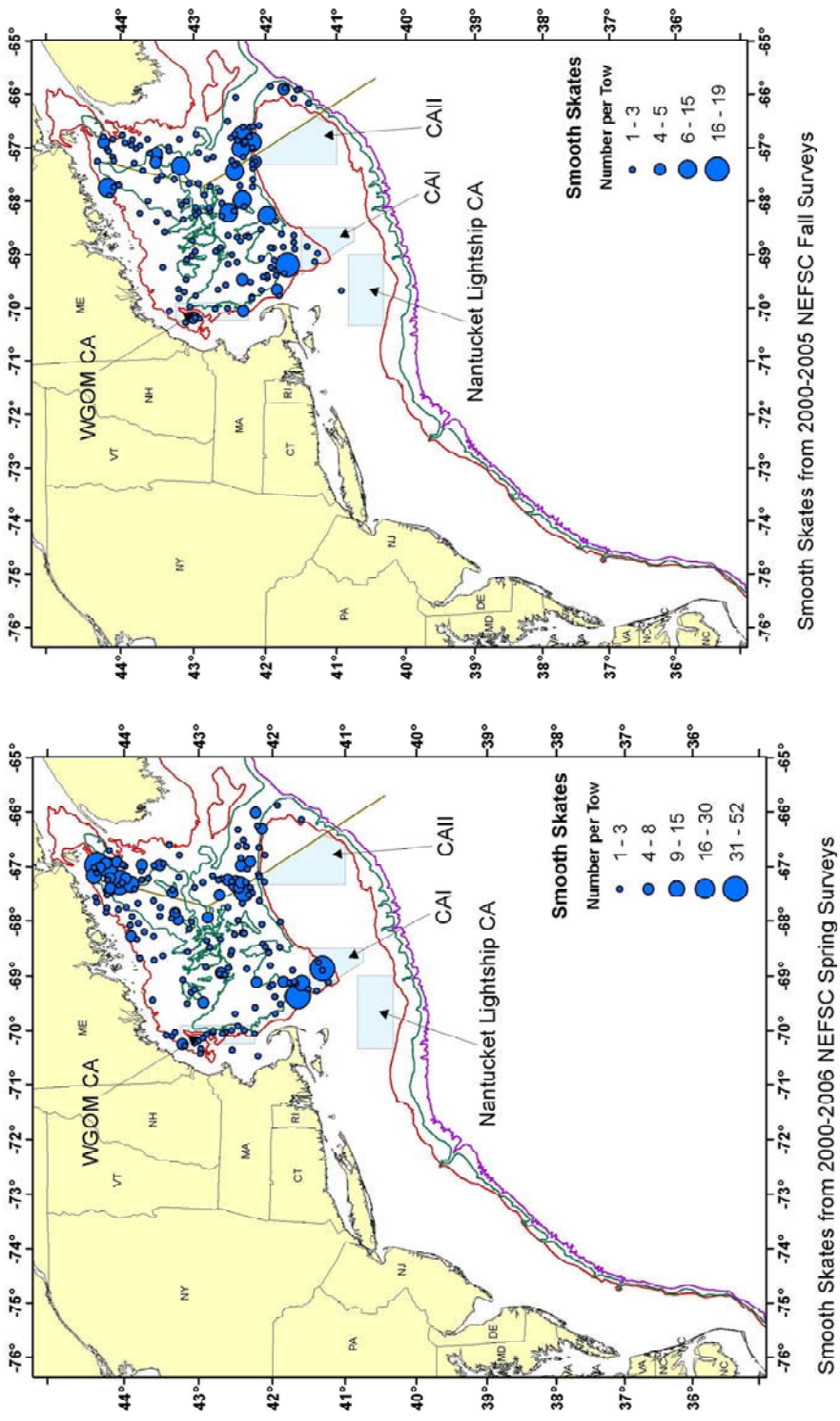


Figure B2.81. Distribution of smooth skate from the spring and autumn NEFSC surveys from 2000-2006.

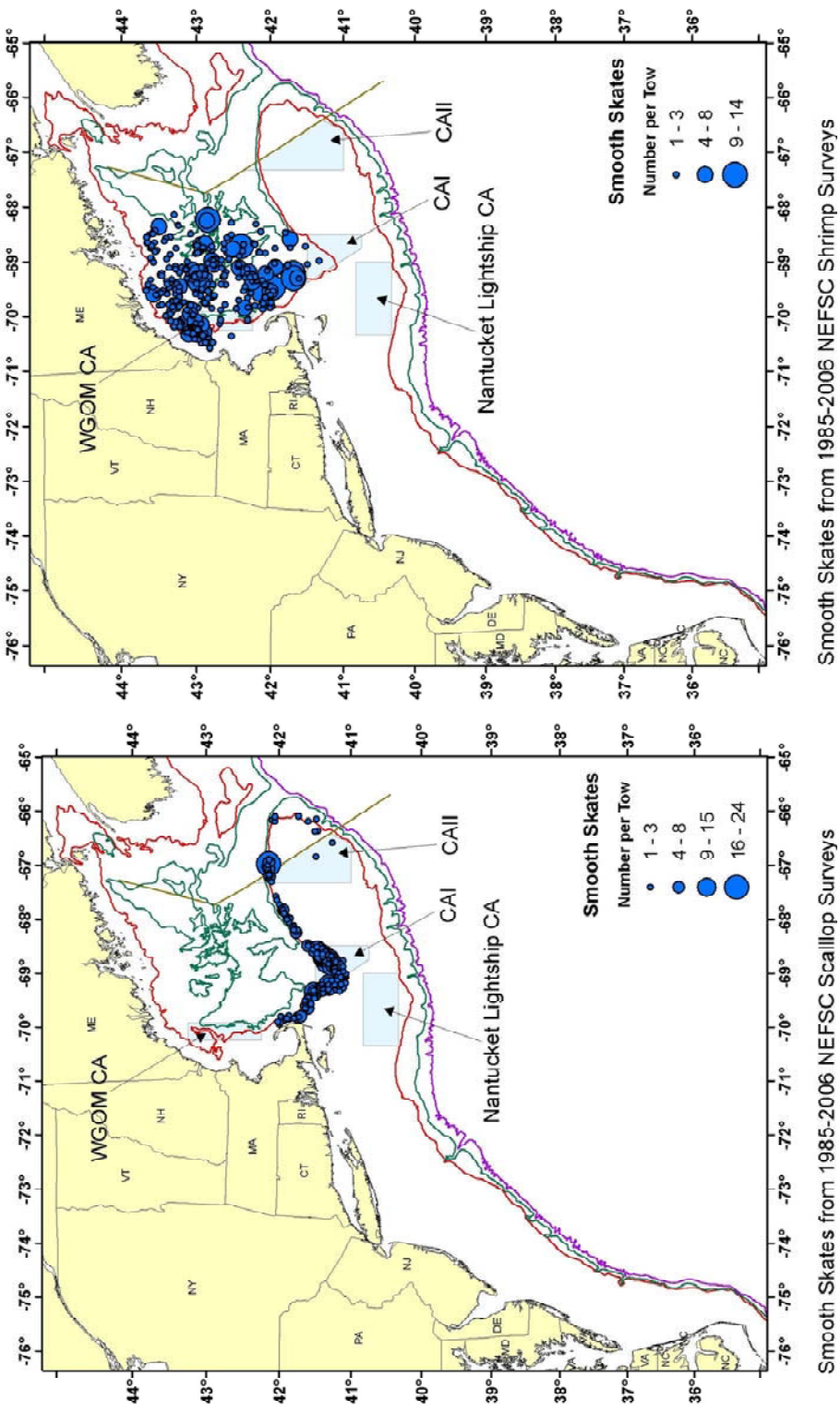


Figure B2.82. Distribution of smooth skate from the NEFSC scallop and shrimp surveys from 1985-2006.

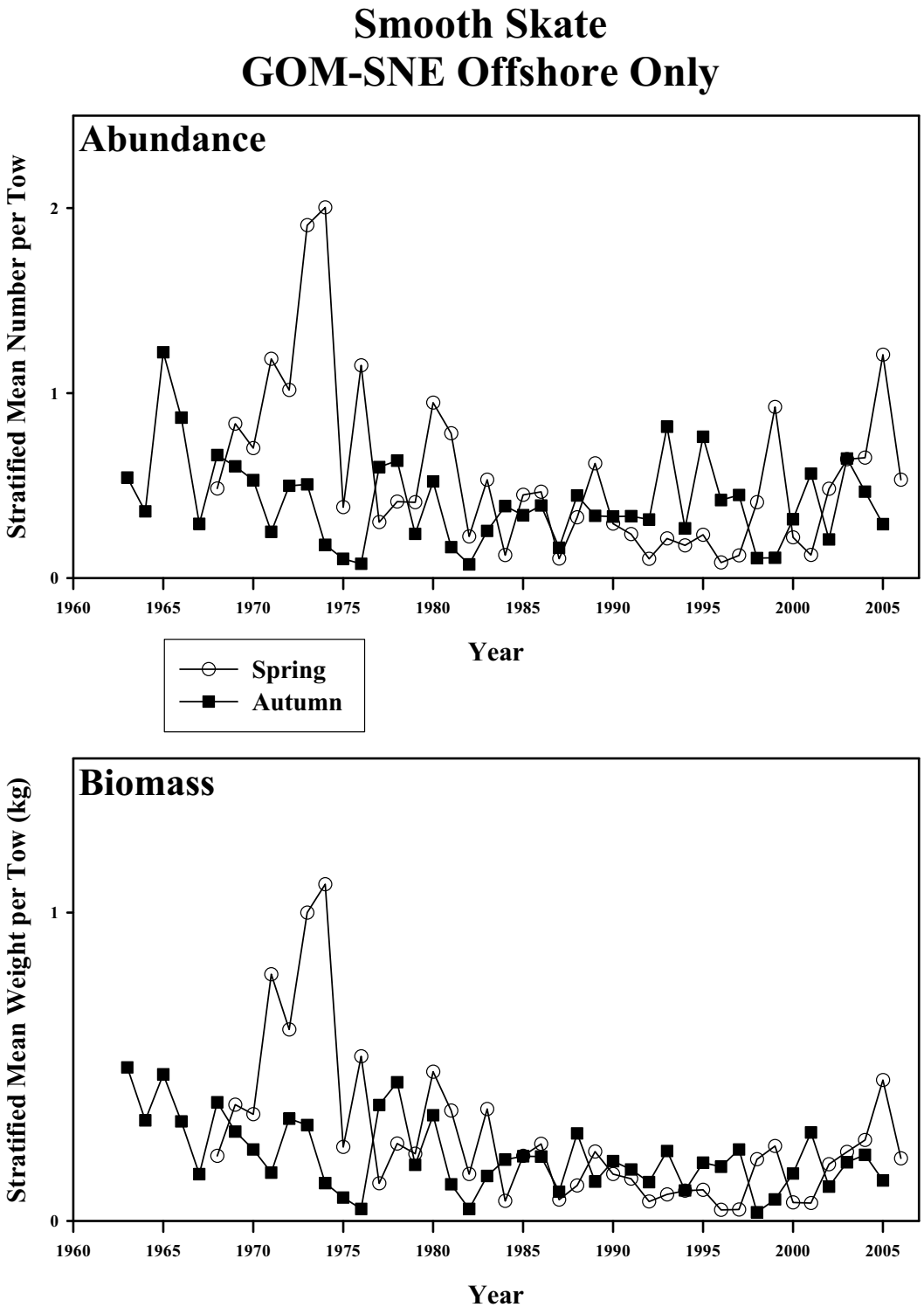


Figure B2.83. Abundance and biomass of smooth skate from the NESFC spring (circles) and autumn (squares) bottom trawl surveys from 1963-2006 in the Gulf of Maine to Southern New England offshore region.

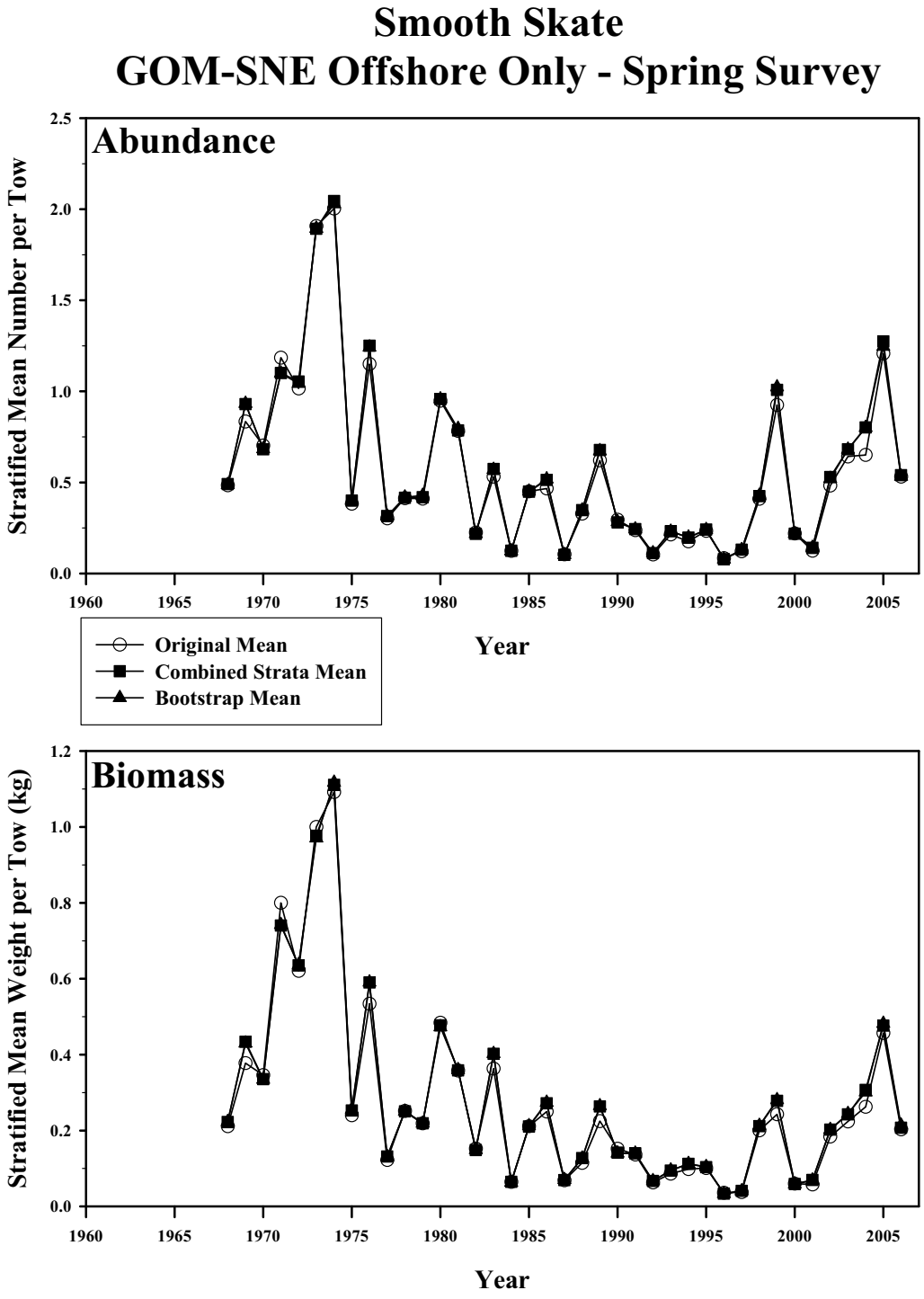


Figure B2.84. Abundance and biomass of smooth skate from the NESFC spring bottom trawl surveys from 1968-2006 in the Gulf of Maine to Southern New England offshore region. The circles represent the original stratified mean, the squares represent the mean combining strata for bootstrapping, and the triangles represent the bootstrapped mean.

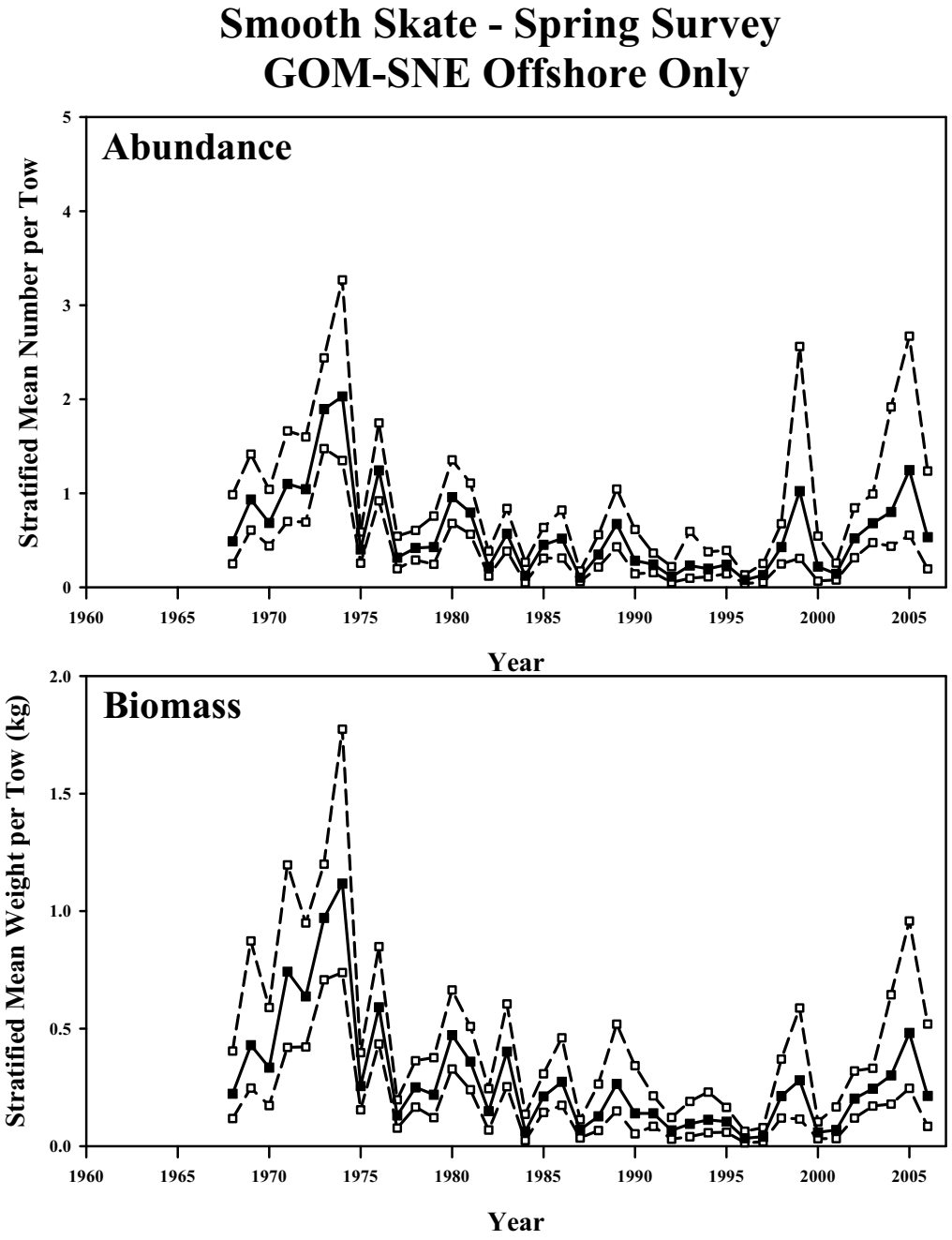


Figure B2.85. Bootstrapped abundance and biomass of smooth skate from the NESFC spring bottom trawl survey in the Gulf of Maine to Southern New England offshore region. Mean index in solid squares, 95% confidence interval in open squares.

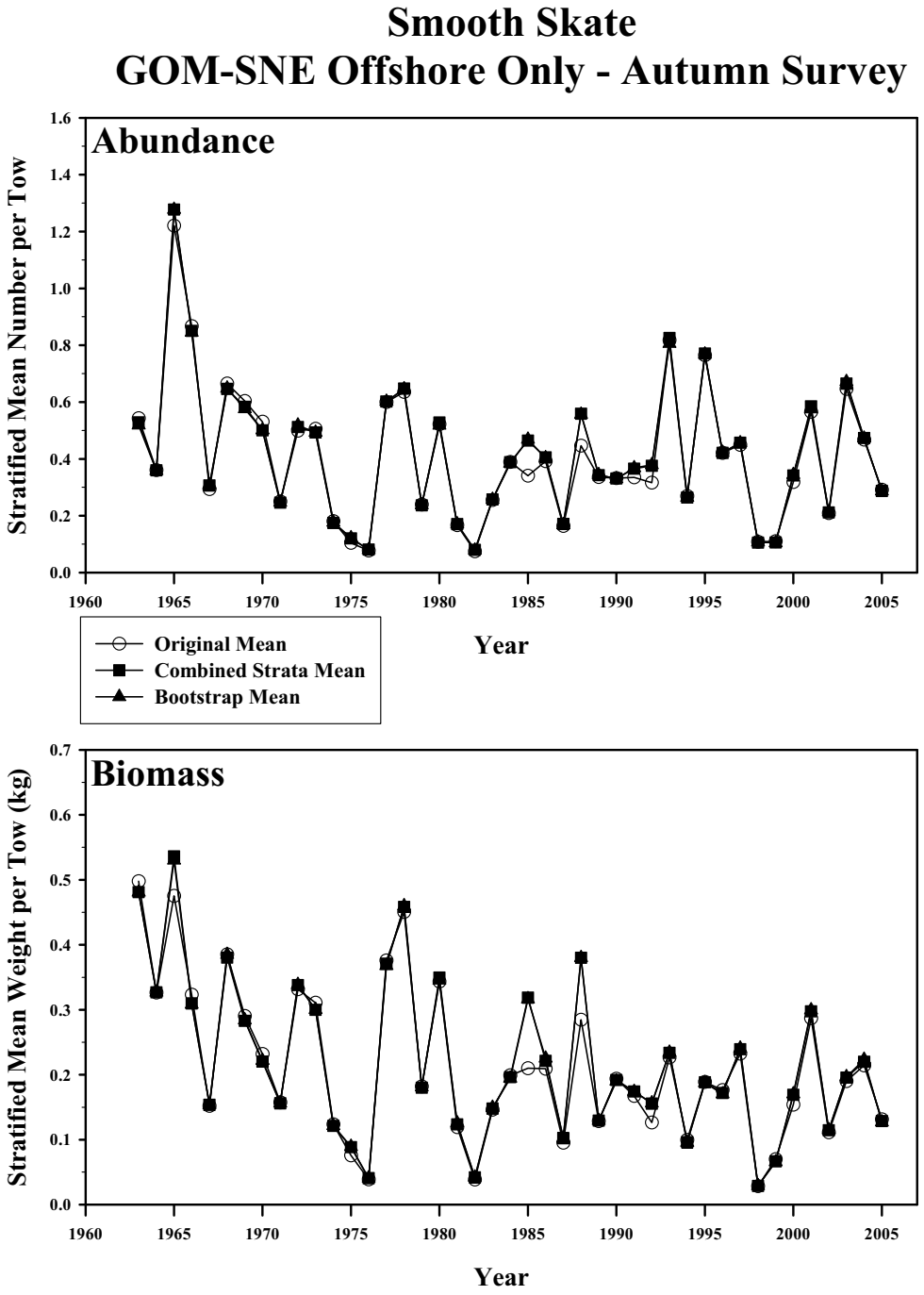


Figure B2.86. Abundance and biomass of smooth skate from the NESFC autumn bottom trawl surveys from 1968-2006 in the Gulf of Maine to Southern New England offshore region. The circles represent the original stratified mean, the squares represent the mean combining strata for bootstrapping, and the triangles represent the bootstrapped mean.

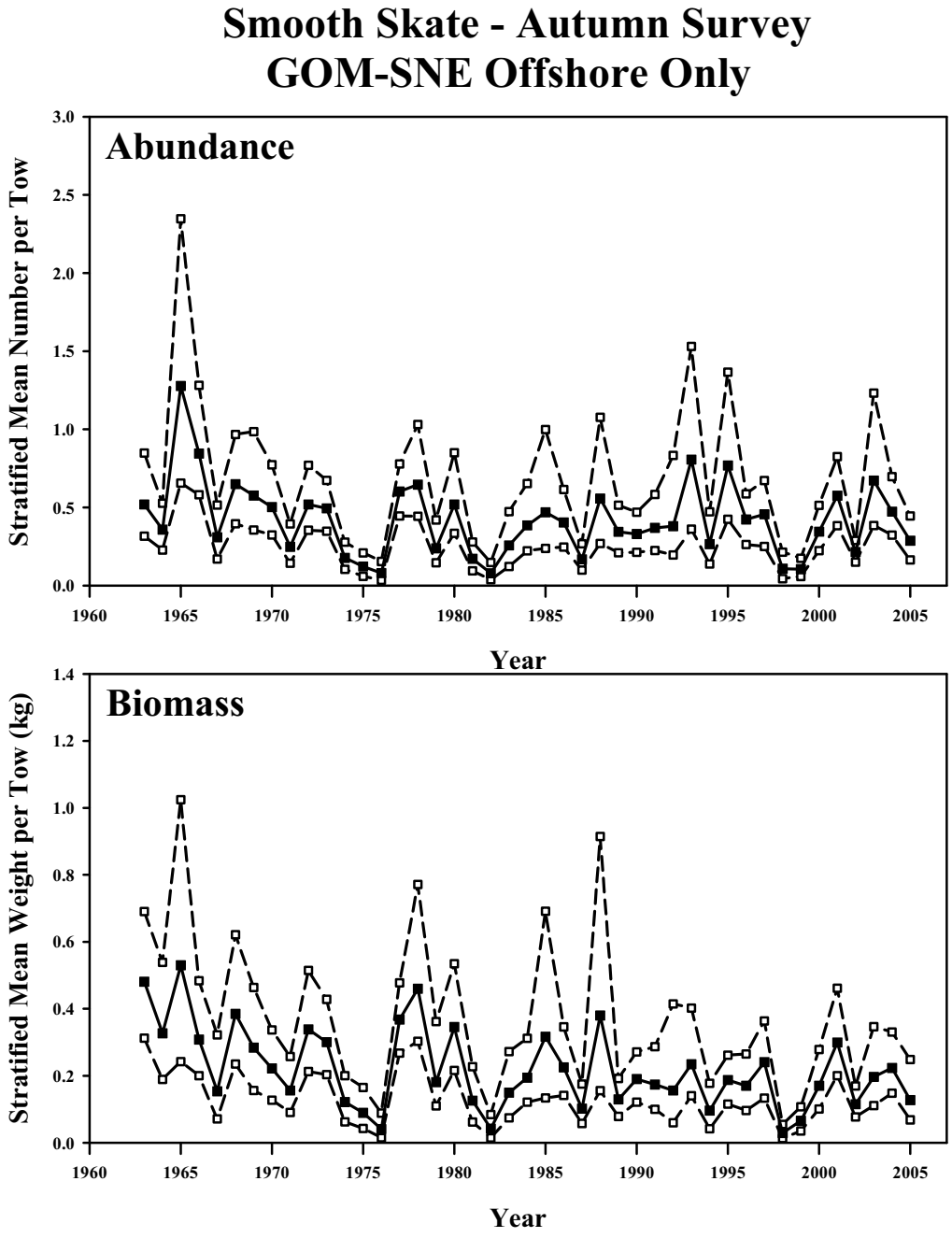


Figure B2.87. Bootstrapped abundance and biomass of smooth skate from the NESFC autumn bottom trawl survey in the Gulf of Maine to Southern New England offshore region. Mean index in solid squares, 95% confidence interval in open squares.

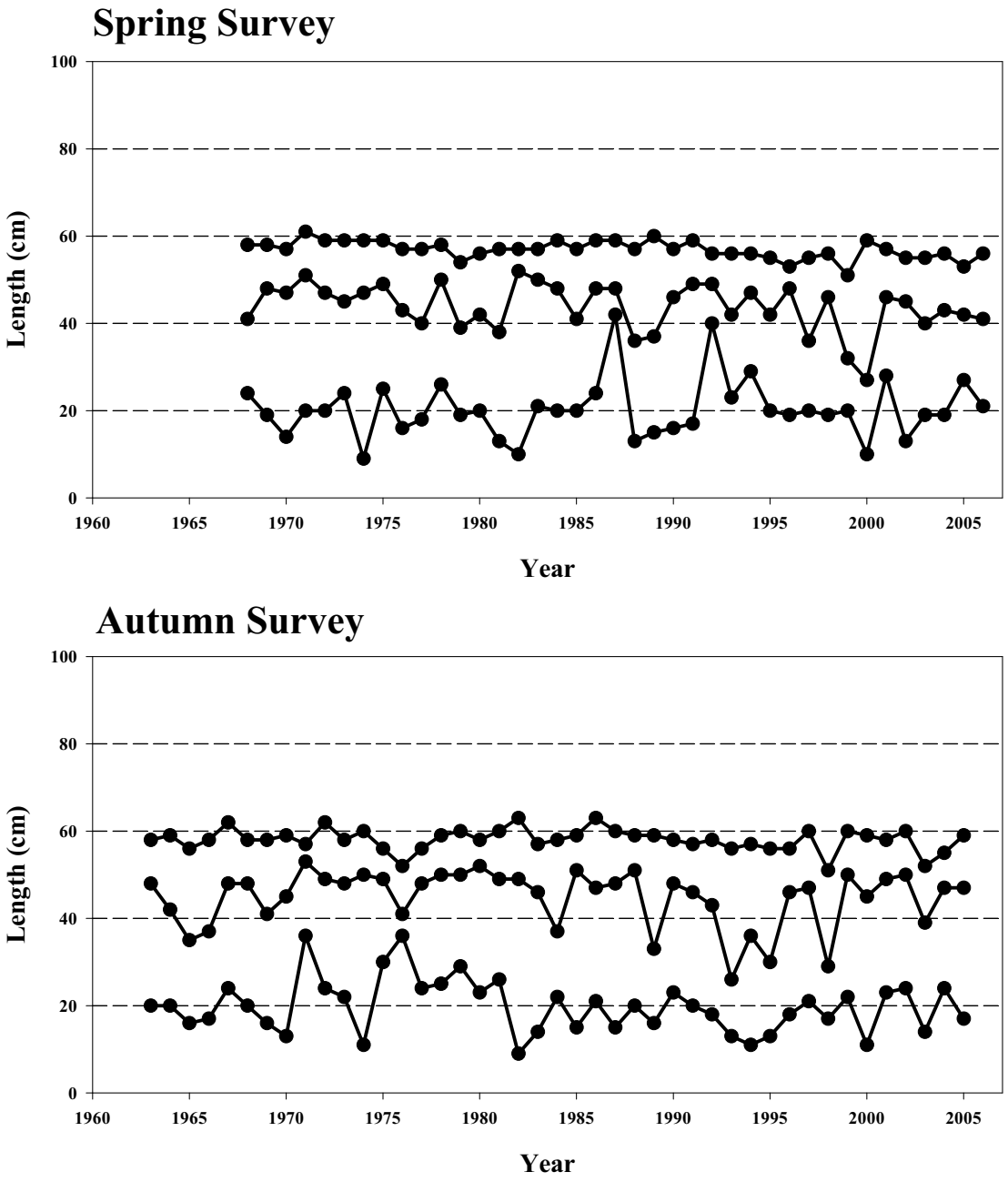


Figure B2.88. Percentiles of length composition (5, 50, and 95) of smooth skate from the NESFC spring and autumn bottom trawl surveys from 1963-2006 in the Gulf of Maine to Southern New England offshore region.

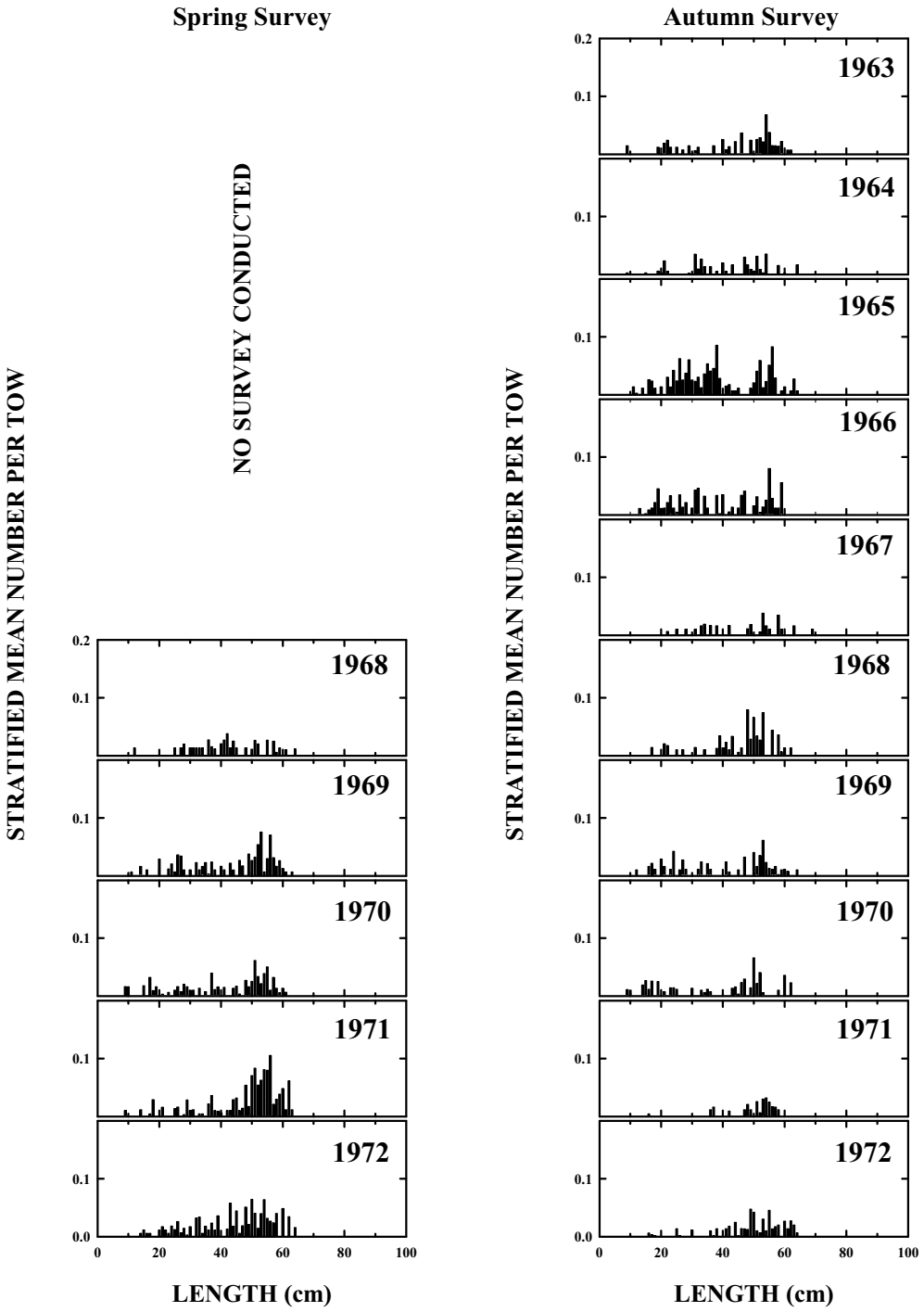


Figure B2.89. Smooth skate length composition from the NEFSC spring and autumn bottom trawl surveys in the Gulf of Maine to Southern New England offshore region, 1963-1972.

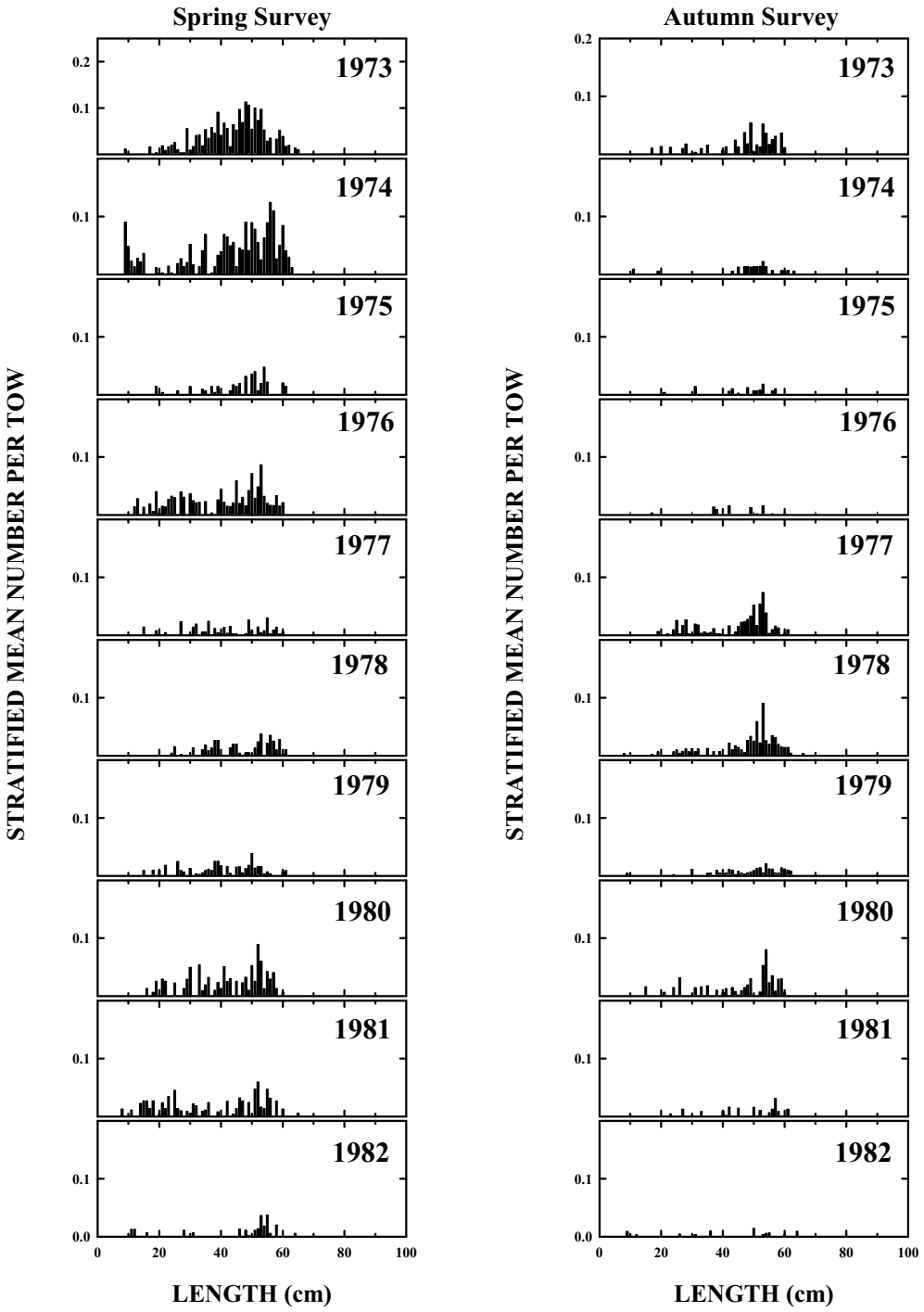


Figure B2.90. Smooth skate length composition from the NEFSC spring and autumn bottom trawl surveys in the Gulf of Maine to Southern New England offshore region, 1973-1982.

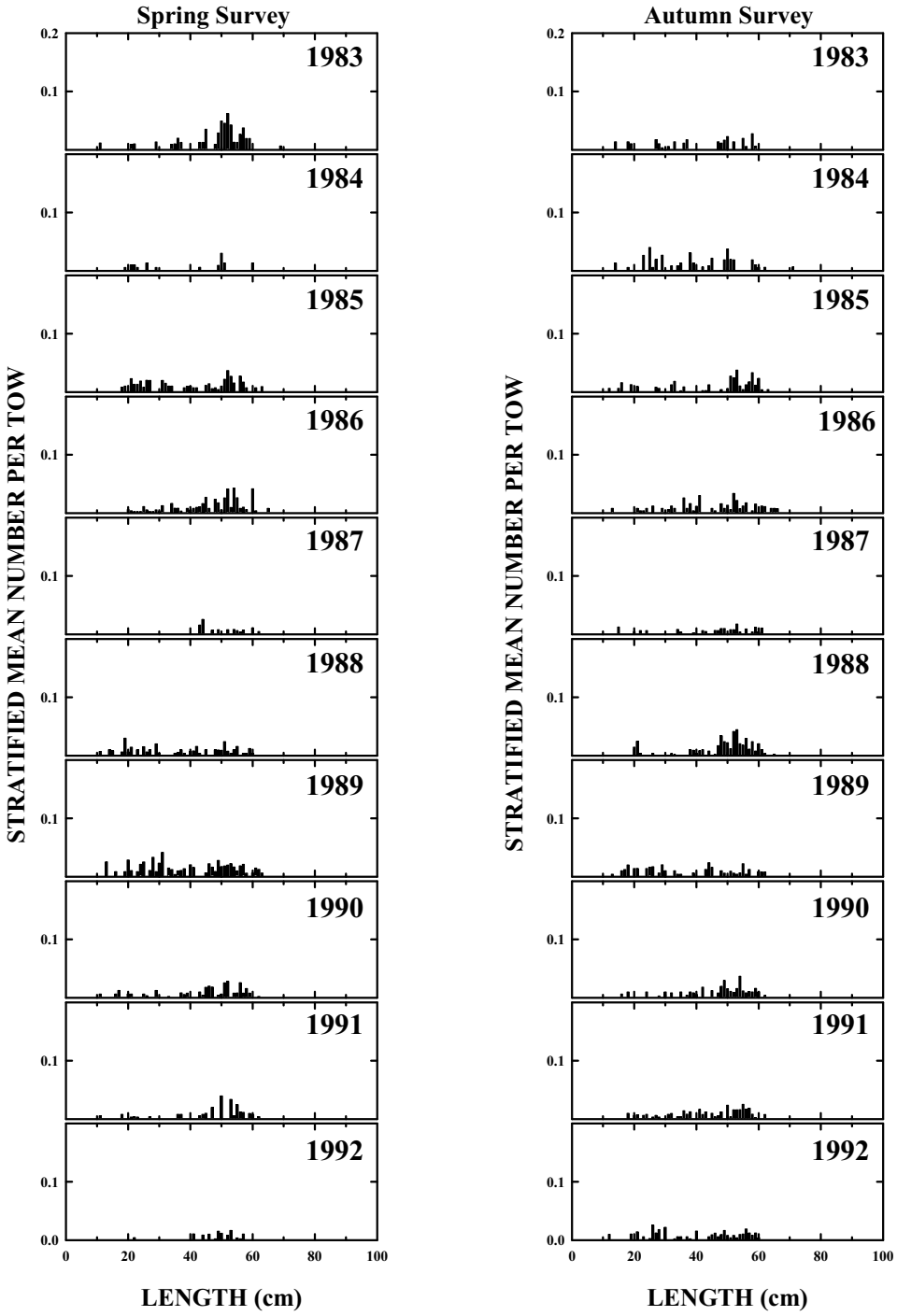


Figure B2.91. Smooth skate length composition from the NEFSC spring and autumn bottom trawl surveys in the Gulf of Maine to Southern New England offshore region, 1983-1992.

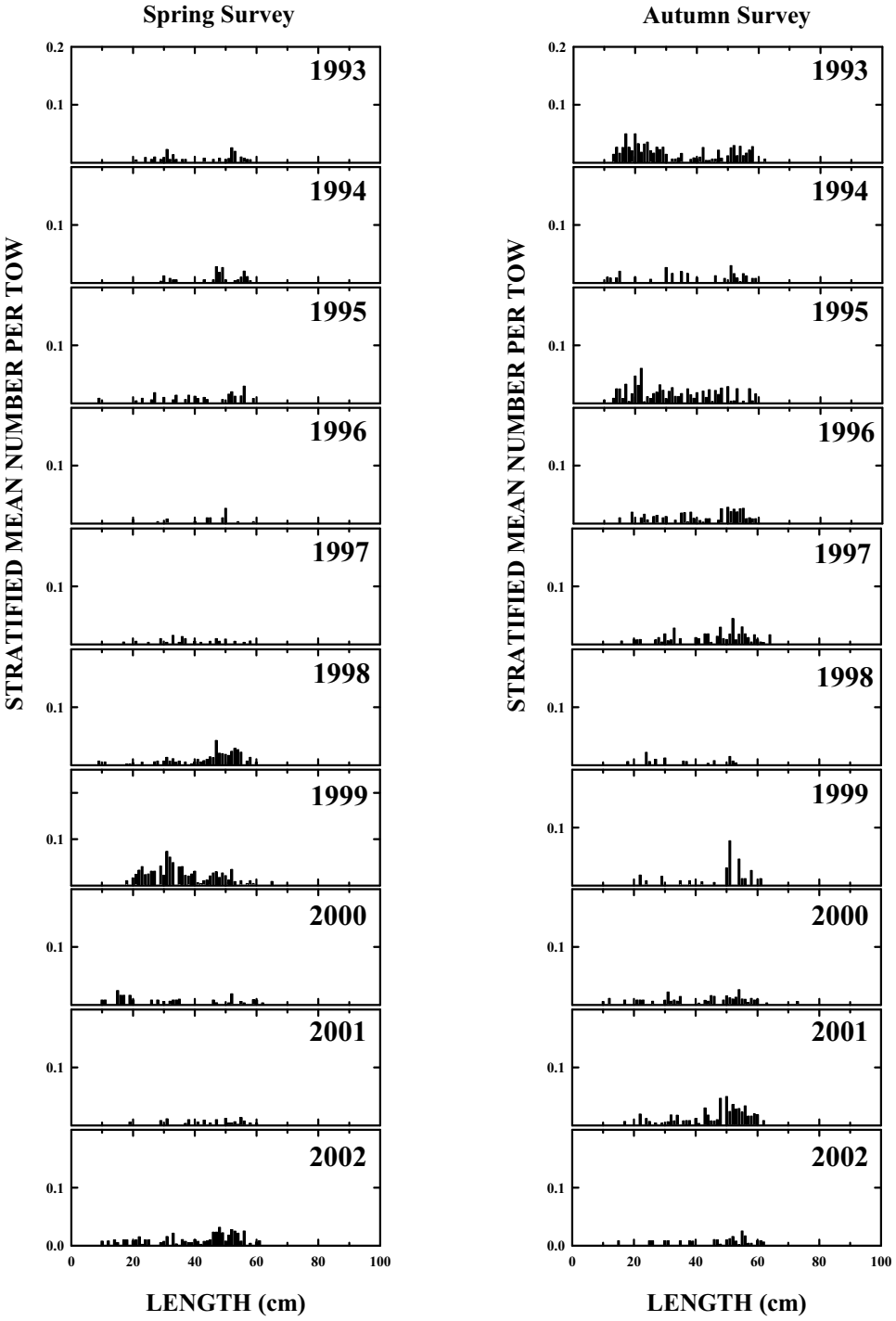


Figure B2.92. Smooth skate length composition from the NEFSC spring and autumn bottom trawl surveys in the Gulf of Maine to Southern New England offshore region, 1993-2002.

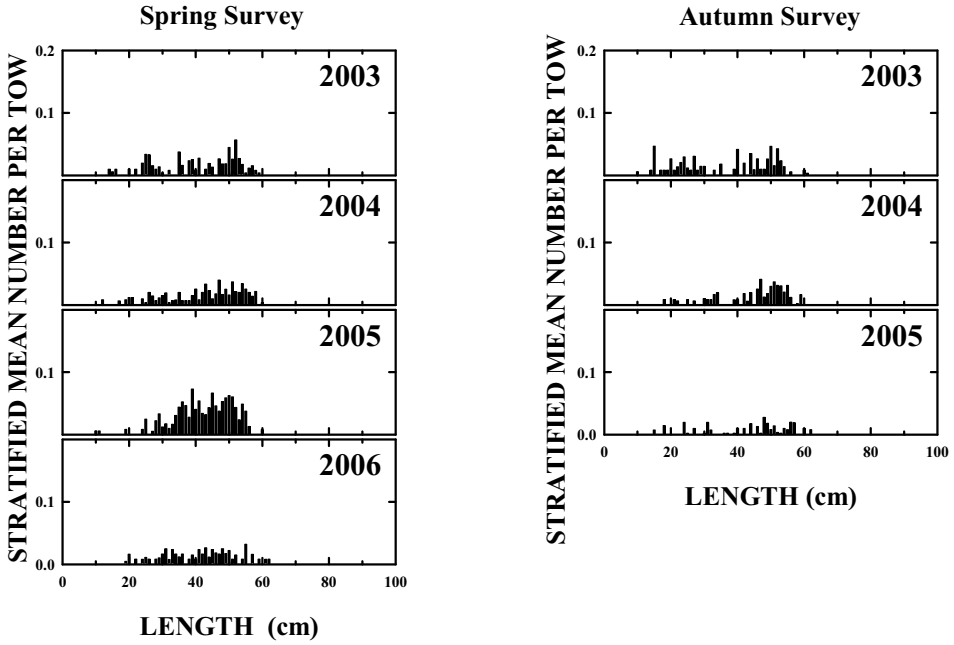


Figure B2.93. Smooth skate length composition from the NEFSC spring and autumn bottom trawl surveys in the Gulf of Maine to Southern New England offshore region, 2003-2006.

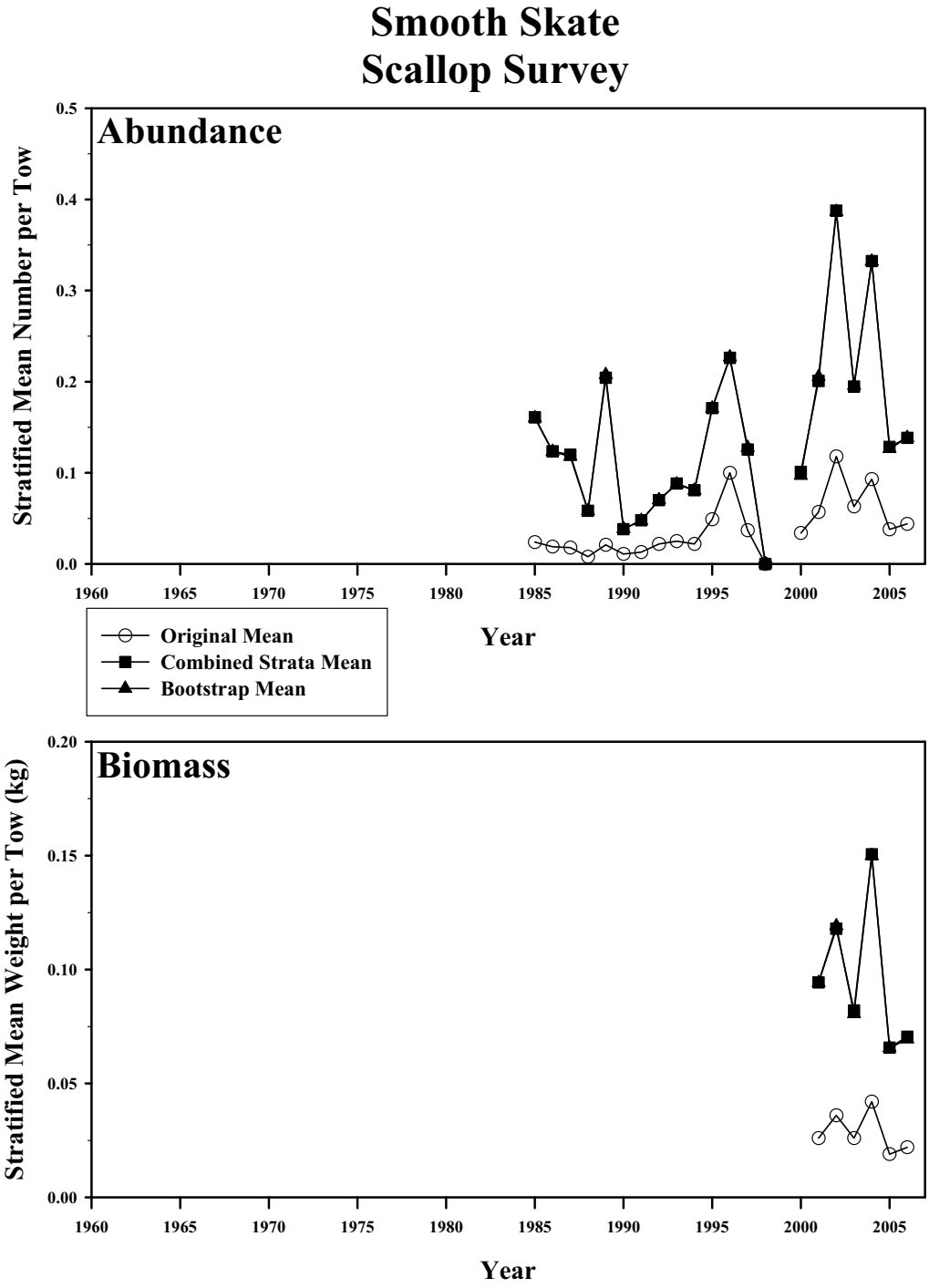


Figure B2.94. Abundance and biomass of smooth skate from the NESFC scallop surveys from 1985-2006. The circles represent the original stratified mean, the squares represent the mean combining strata for bootstrapping, and the triangles represent the bootstrapped mean.

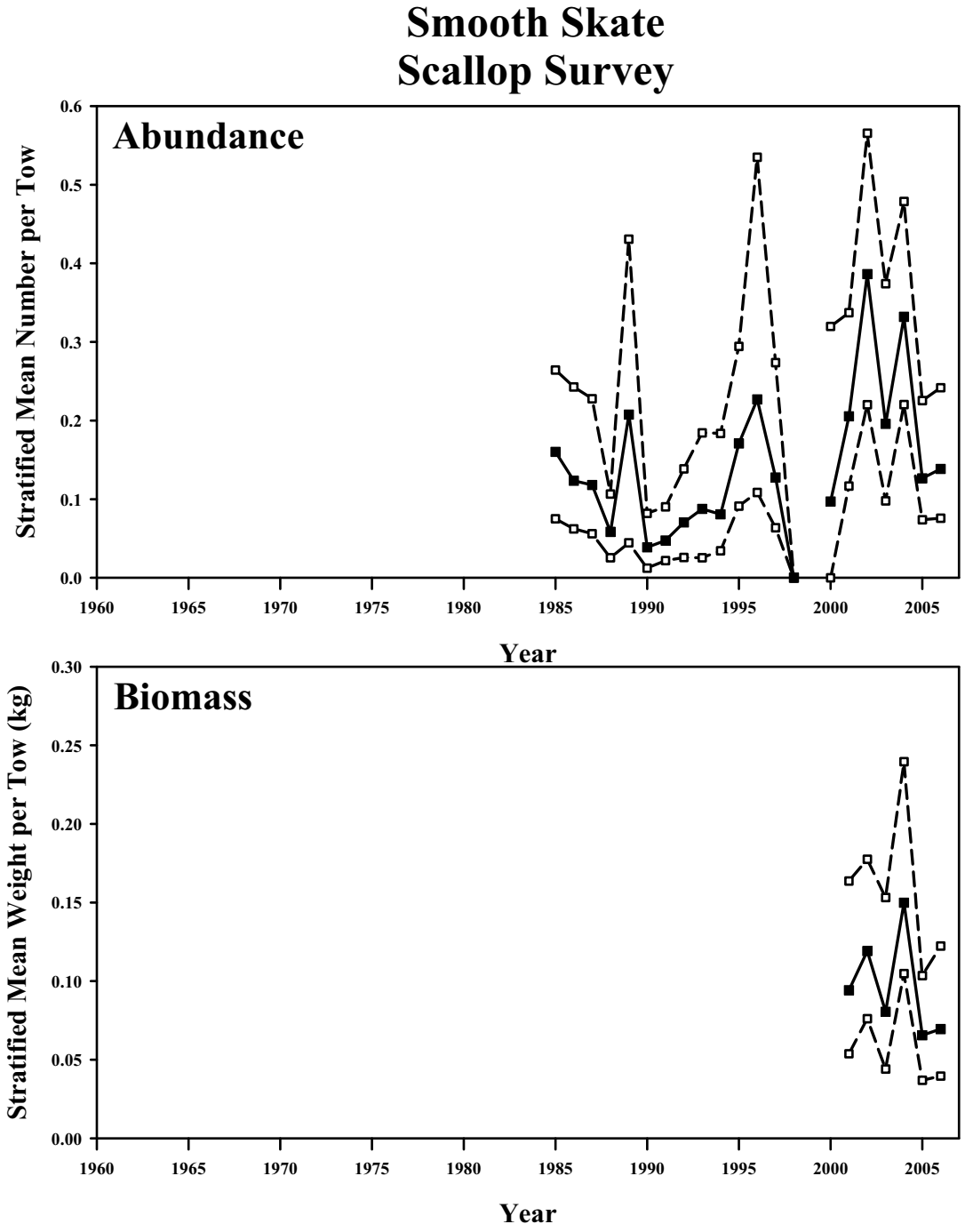


Figure B2.95. Bootstrapped abundance and biomass of smooth skate from the NESFC scallop survey. Mean index in solid squares, 95% confidence interval in open squares.

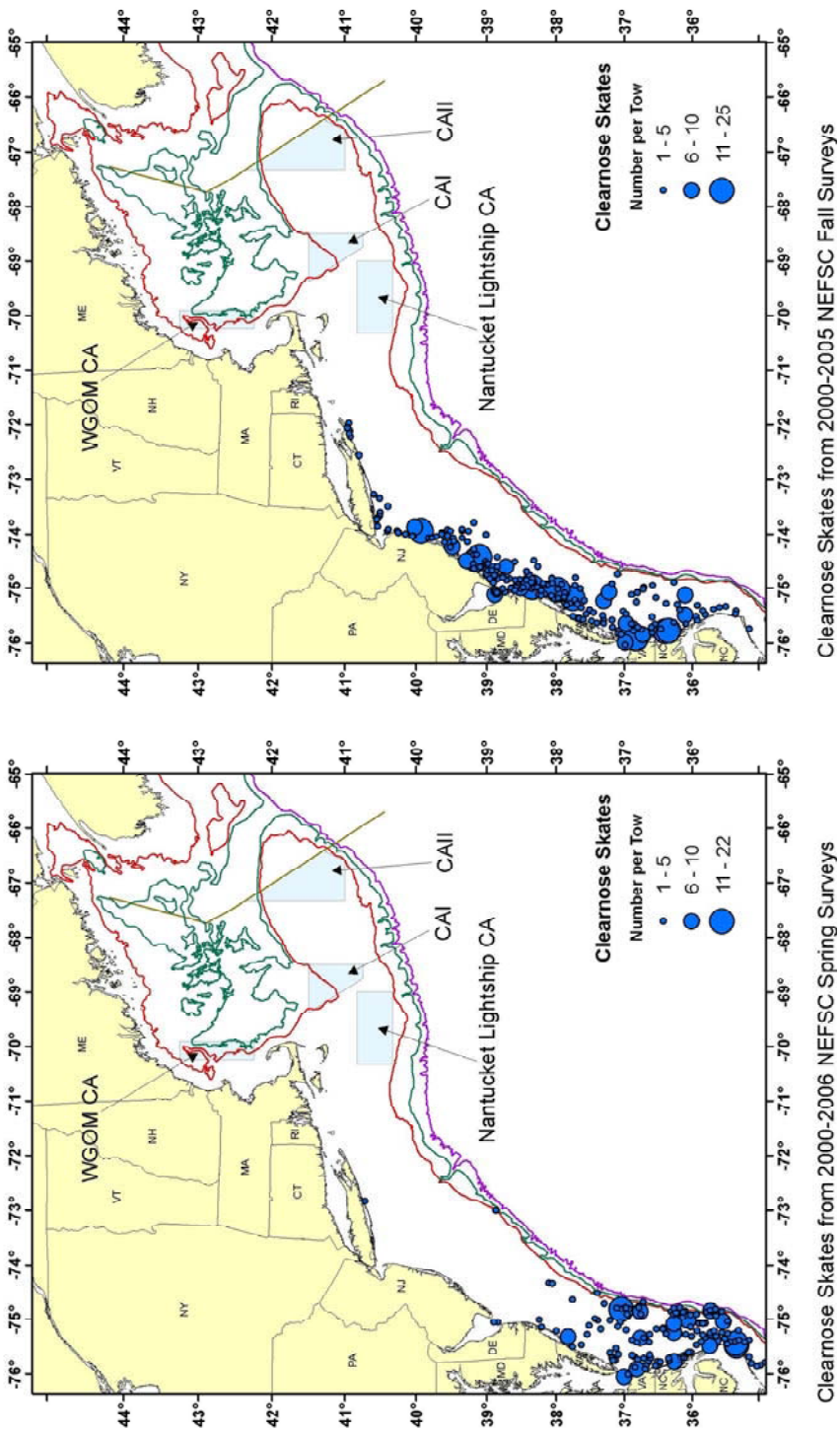
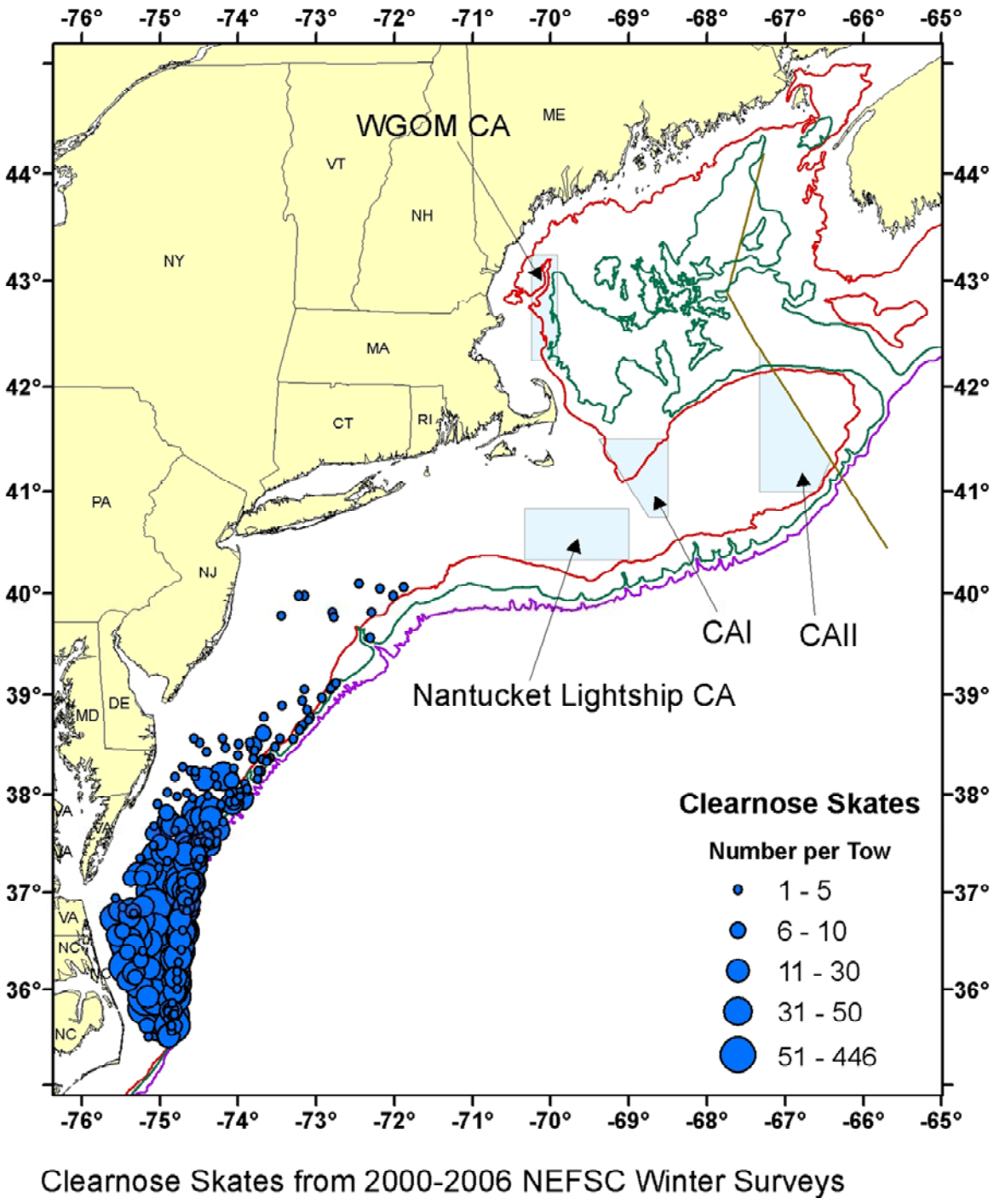


Figure B2.96. Distribution of clearnose skate from the spring and autumn NEFSC surveys from 2000-2006.



Clearnose Skates from 2000-2006 NEFSC Winter Surveys

Figure B2.97. Distribution of clearnose skate from the winter NEFSC surveys from 2000-2006.

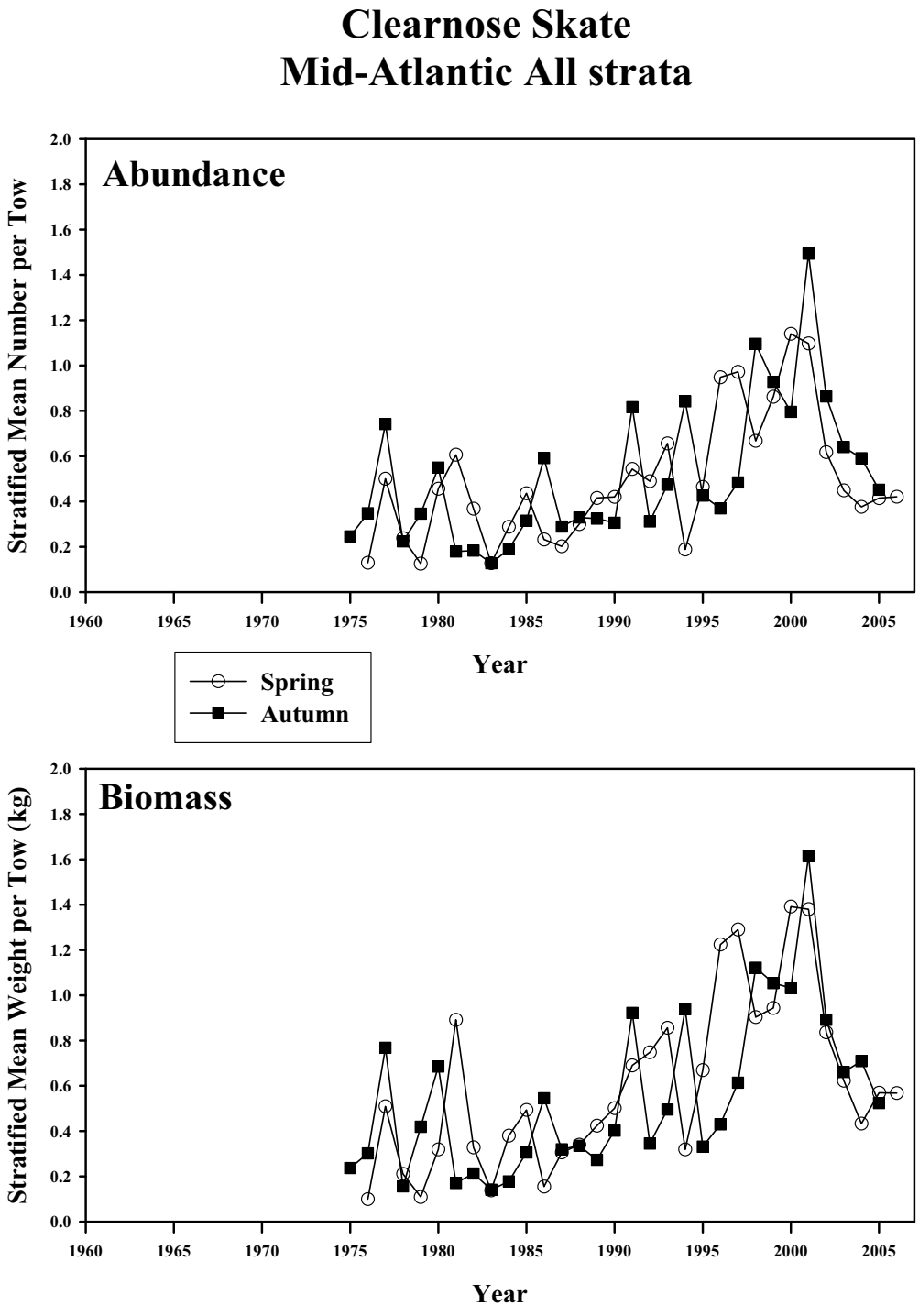


Figure B2.98. Abundance and biomass of clearnose skate from the NESFC spring (circles) and autumn (squares) bottom trawl surveys from 1975-2006 in the Mid-Atlantic (all strata).

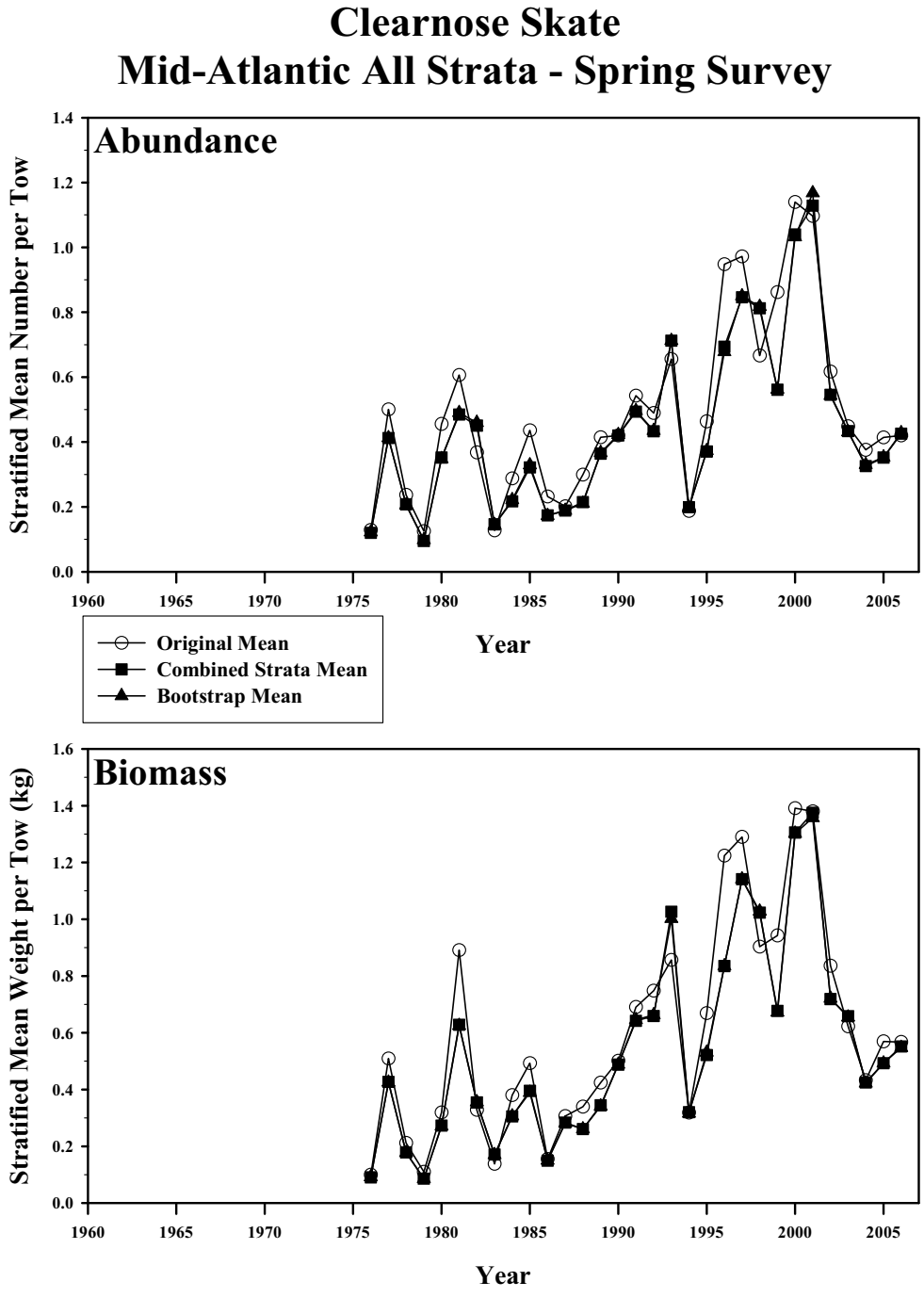


Figure B2.99. Abundance and biomass of clearnose skate from the NESFC spring bottom trawl surveys from 1976-2006 in the Mid-Atlantic (all strata). The circles represent the original stratified mean, the squares represent the mean combining strata for bootstrapping, and the triangles represent the bootstrapped mean.

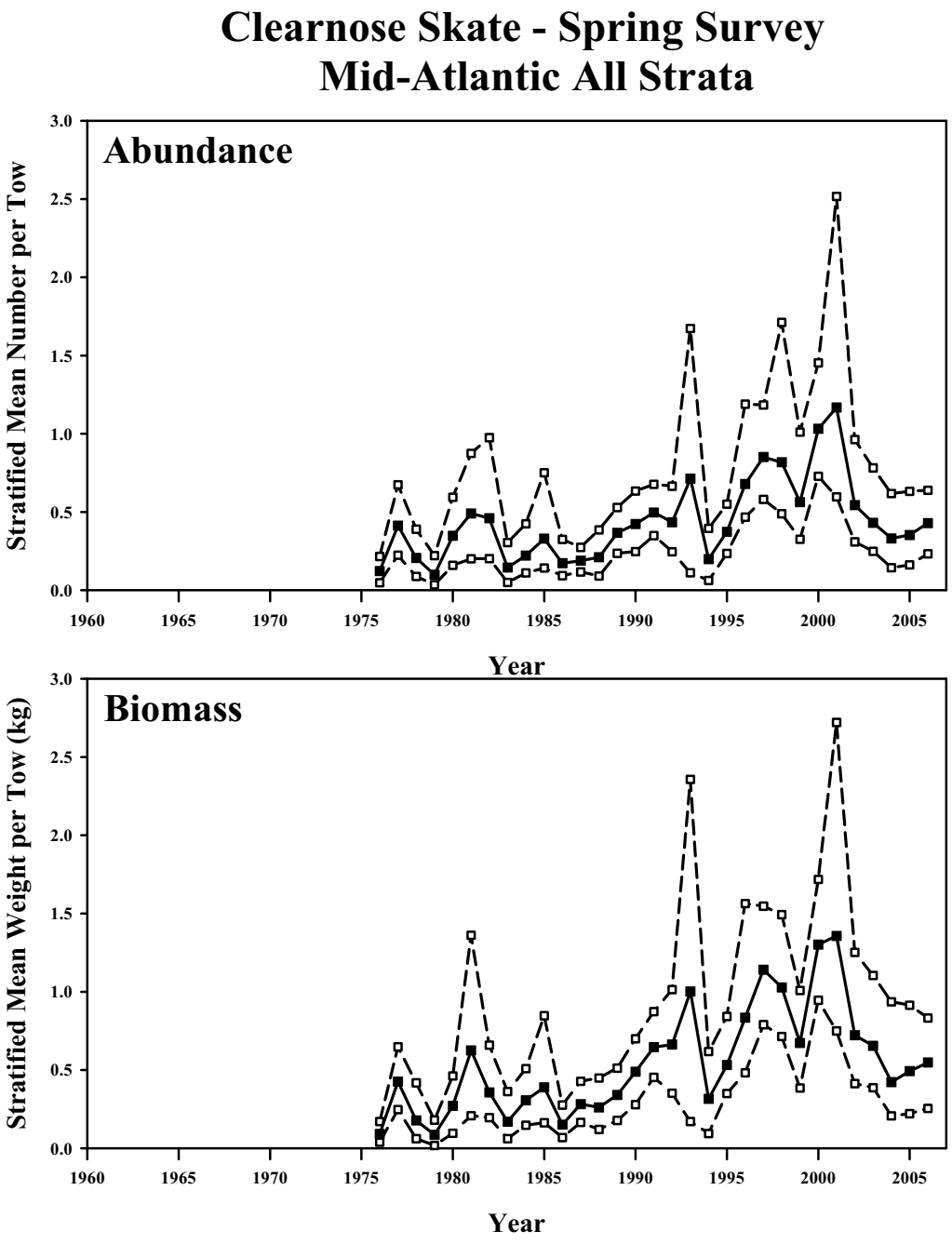


Figure B2.100. Bootstrapped abundance and biomass of clearnose skate from the NESFC spring bottom trawl survey in the Mid-Atlantic region (all strata). Mean index in solid squares, 95% confidence interval in open squares.

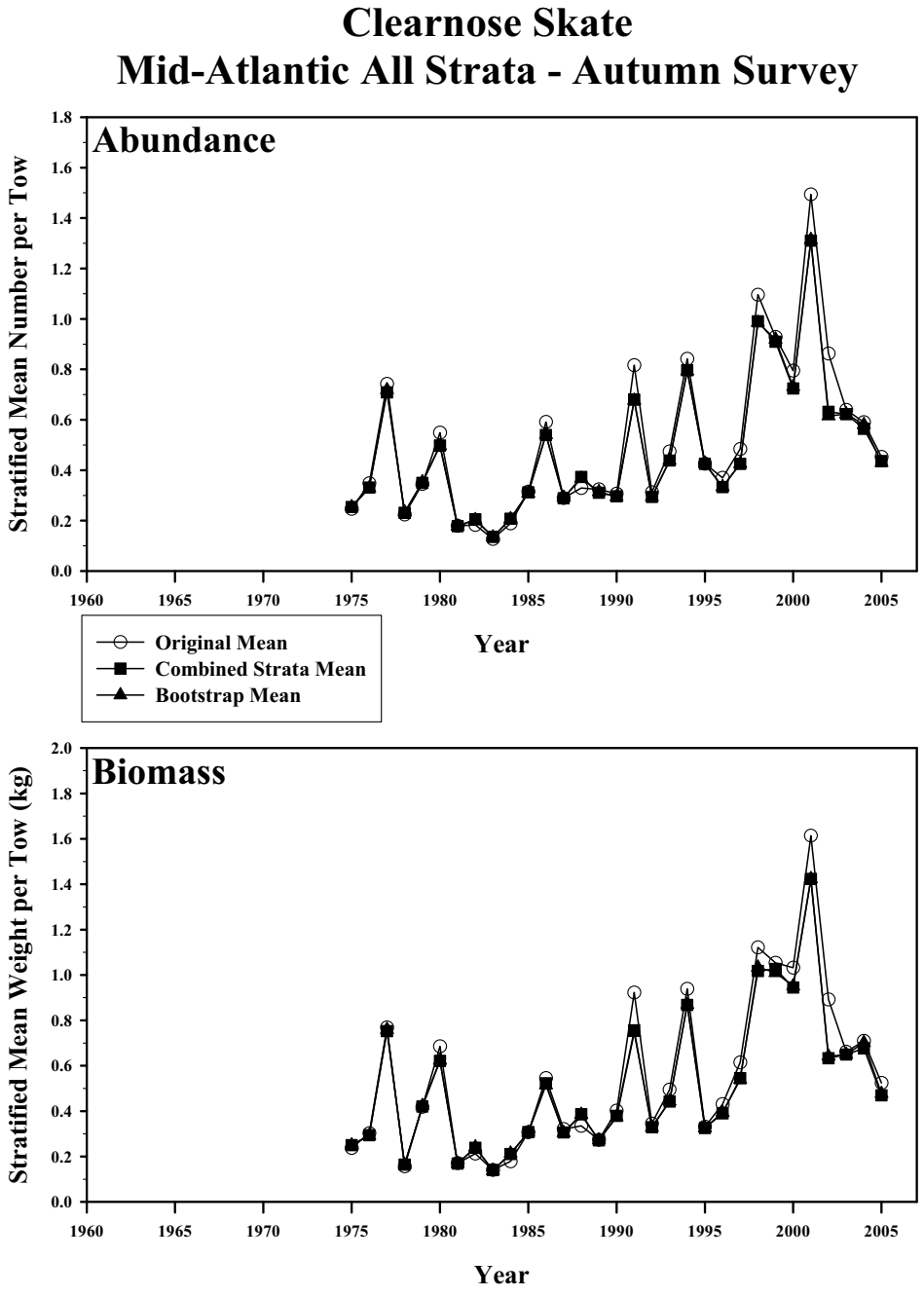


Figure B2.101. Abundance and biomass of clearnose skate from the NESFC autumn bottom trawl surveys from 1976-2006 in the Mid-Atlantic (all strata). The circles represent the original stratified mean, the squares represent the mean combining strata for bootstrapping, and the triangles represent the bootstrapped mean.

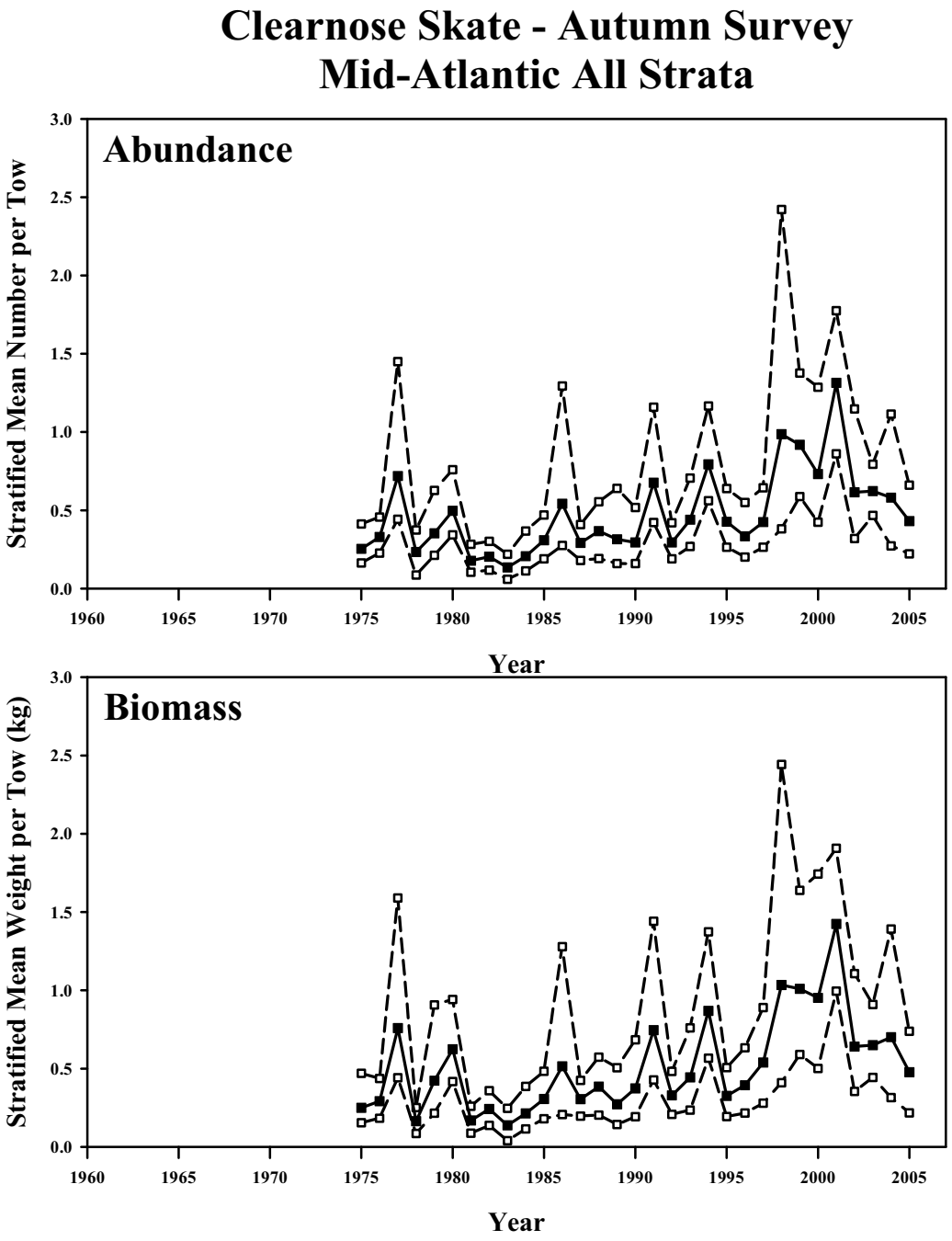


Figure B2.102. Bootstrapped abundance and biomass of clearnose skate from the NESFC autumn bottom trawl survey in the Mid-Atlantic region (all strata). Mean index in solid squares, 95% confidence interval in open squares.

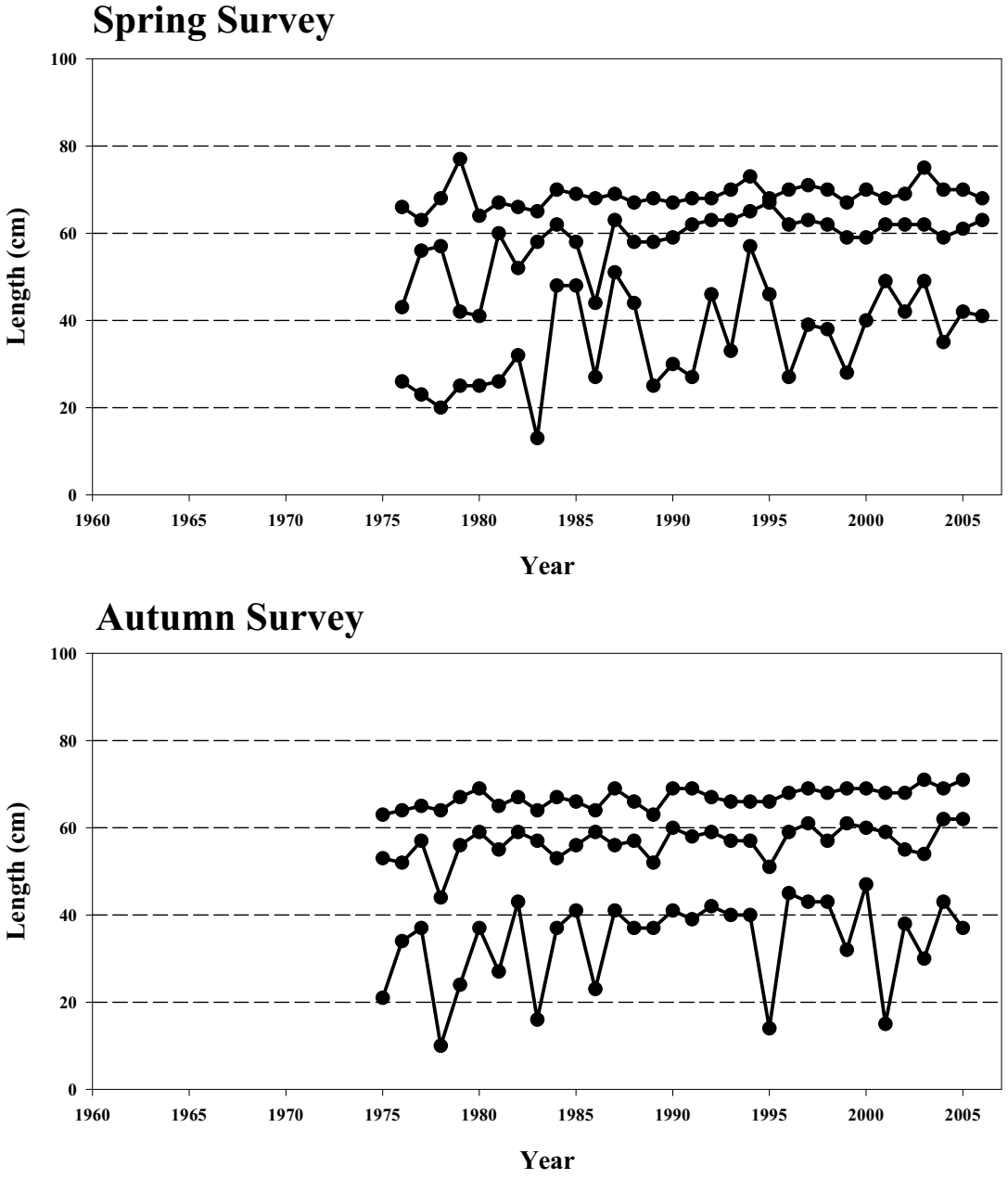


Figure B2.103. Percentiles of length composition (5, 50, and 95) of clearnose skate from the NESFC spring and autumn bottom trawl surveys from 1975-2006 in the Mid-Atlantic region (all strata).

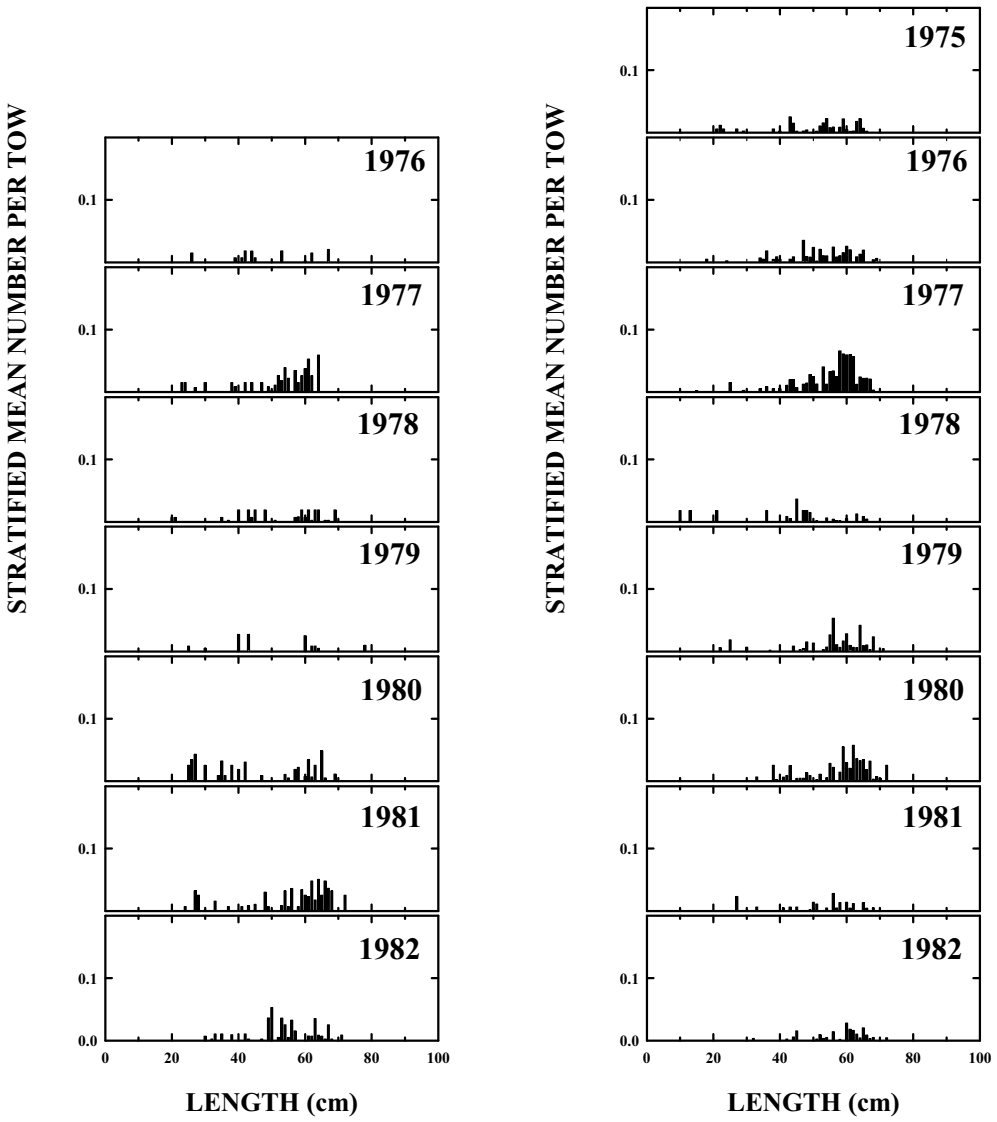


Figure B2.104. Clearnose skate length composition from the NEFSC spring and autumn bottom trawl surveys in the Mid-Atlantic (all strata), 1975-1982.

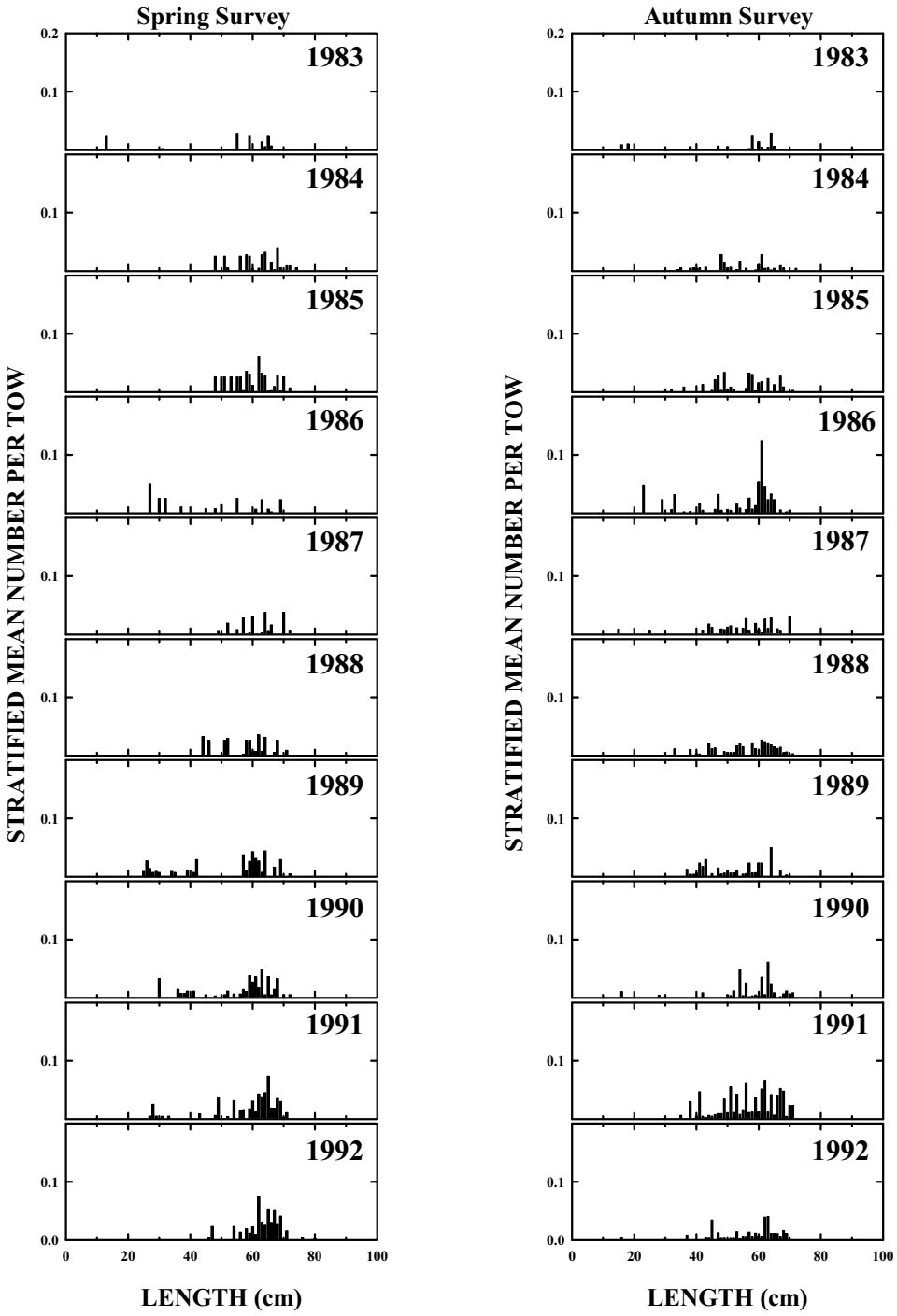


Figure B2.105. Clearnose skate length composition from the NEFSC spring and autumn bottom trawl surveys in the Mid-Atlantic (all strata), 1983-1992.

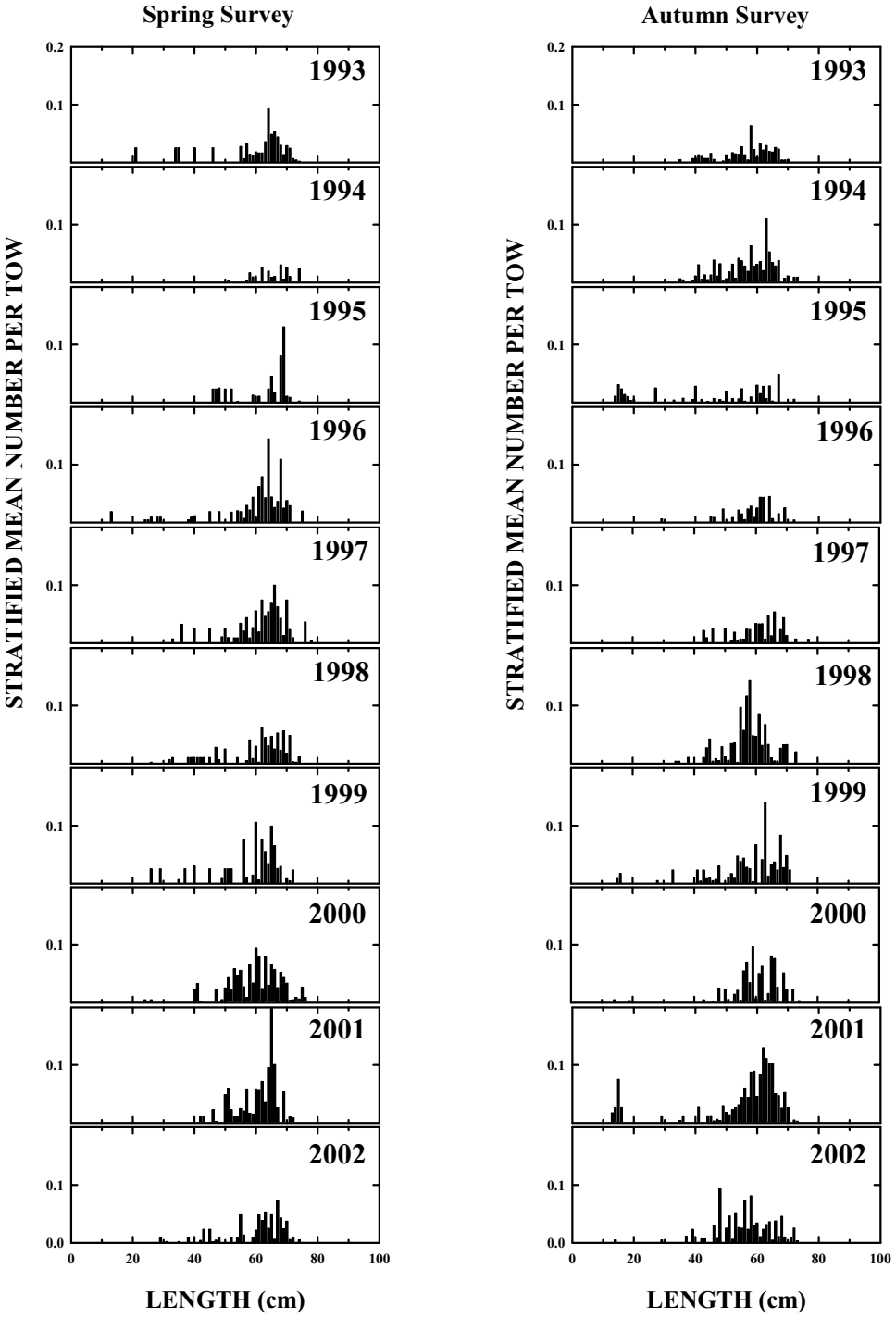


Figure B2.106. Clearnose skate length composition from the NEFSC spring and autumn bottom trawl surveys in the Mid-Atlantic (all strata), 1993-2002.

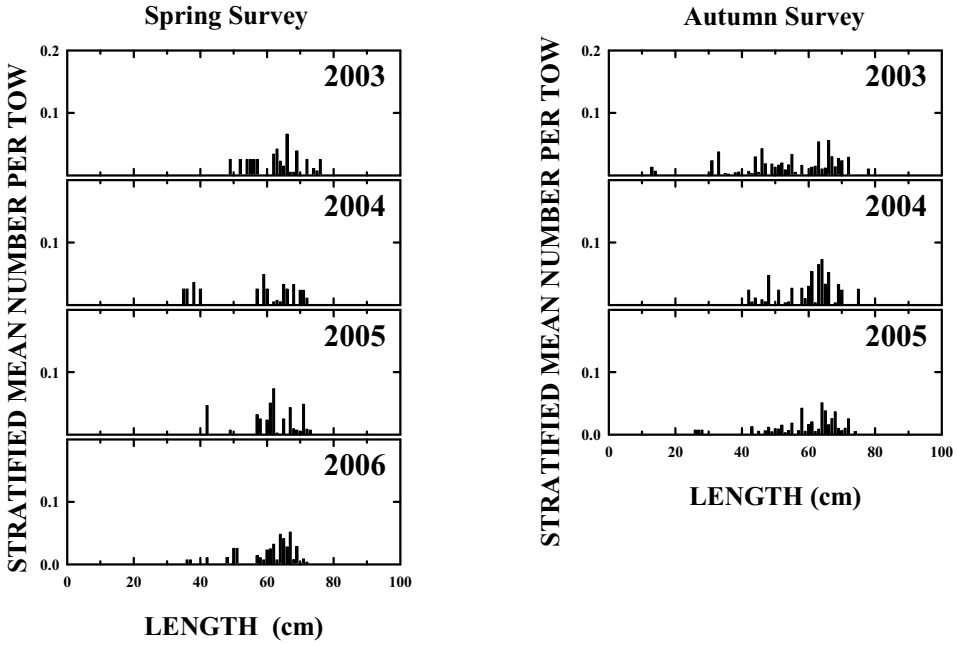


Figure B2.107. Clearnose skate length composition from the NEFSC spring and autumn bottom trawl surveys in the Mid-Atlantic (all strata), 2003-2006.

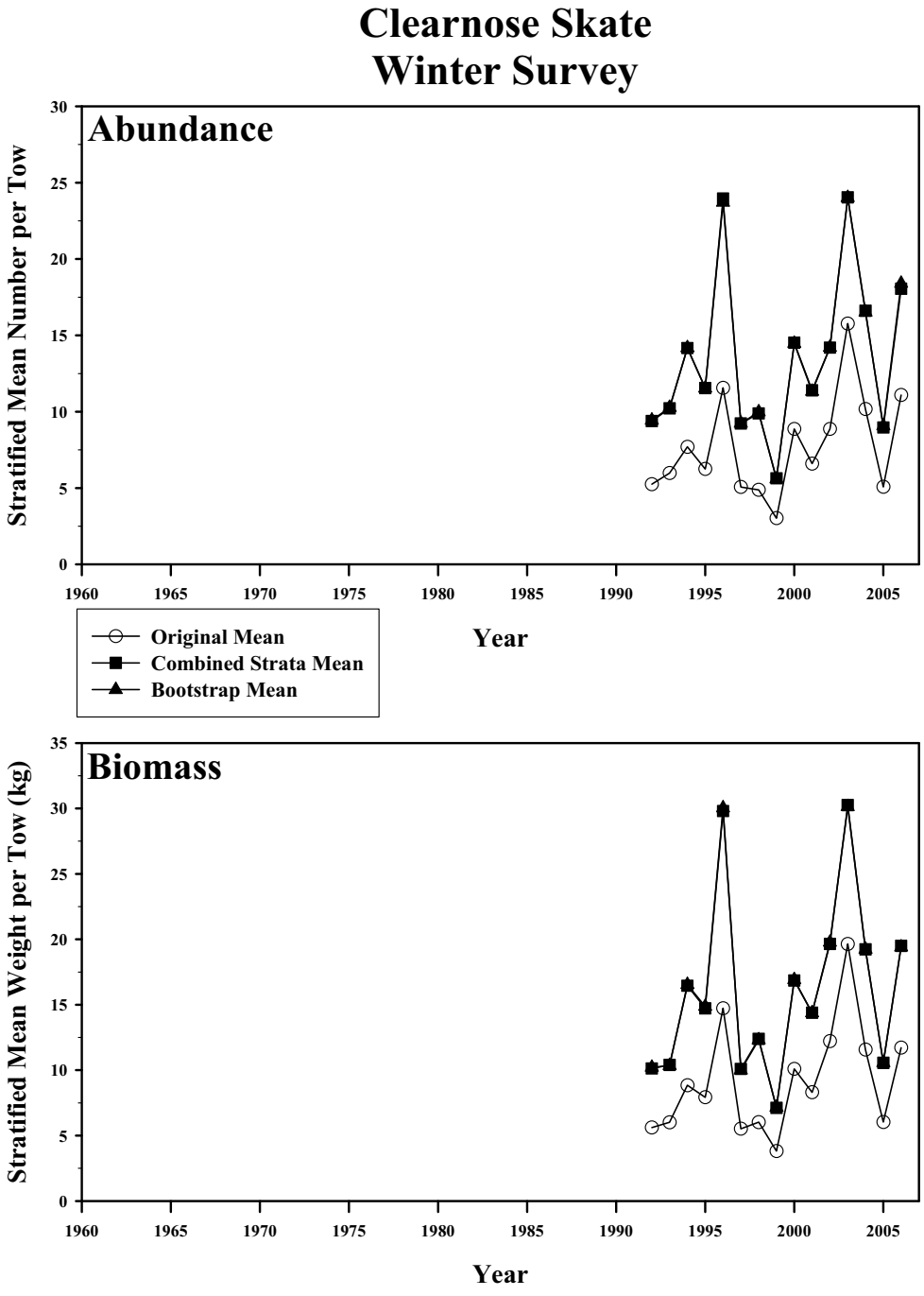


Figure B2.108. Abundance and biomass of clearnose skate from the NESFC winter bottom trawl surveys from 1992-2006. The circles represent the original stratified mean, the squares represent the mean combining strata for bootstrapping, and the triangles represent the bootstrapped mean.

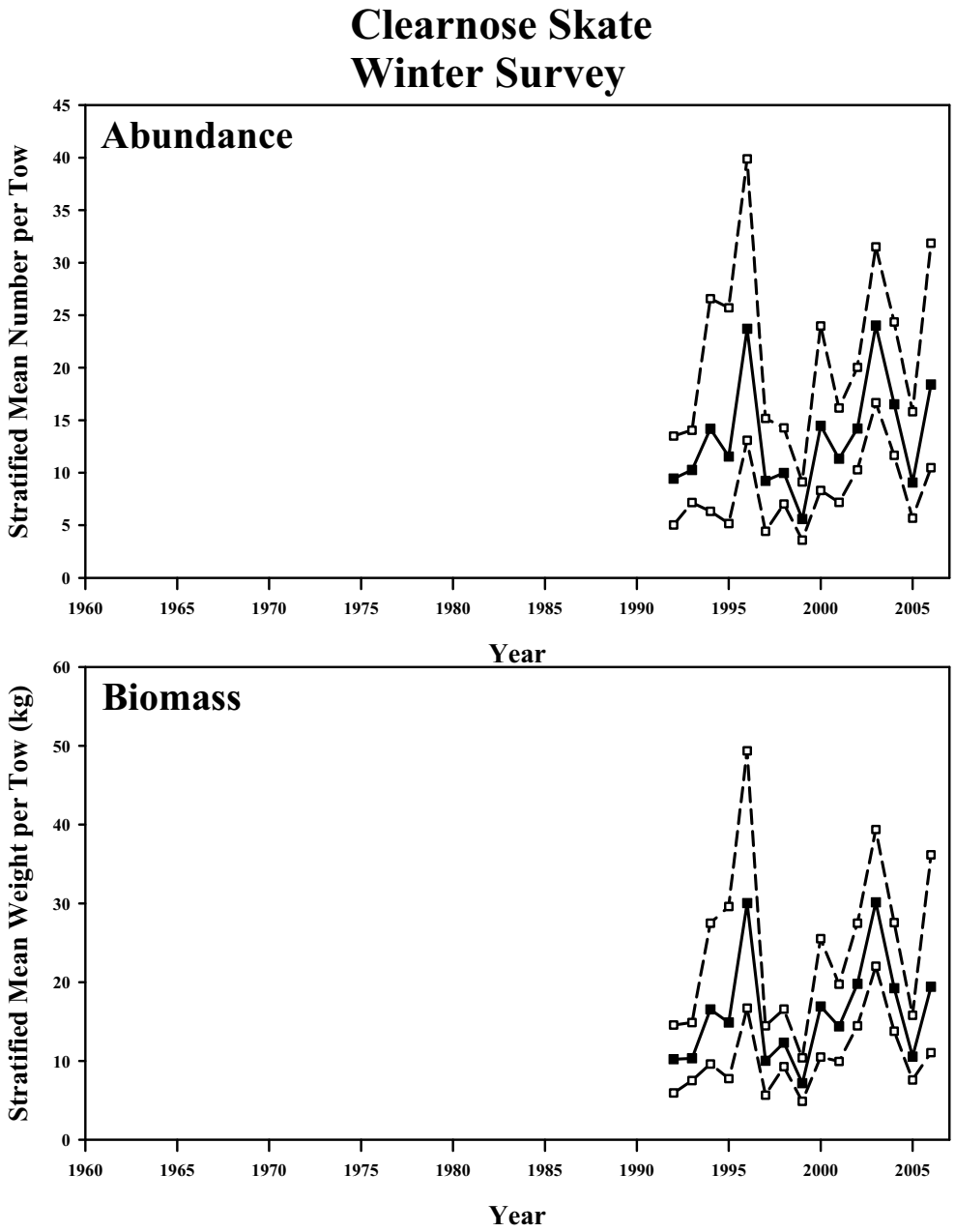


Figure B2.109. Bootstrapped abundance and biomass of clearnose skate from the NESFC winter bottom trawl survey. Mean index in solid squares, 95% confidence interval in open squares.

Clearnose Skate - CTDEP Finfish Survey

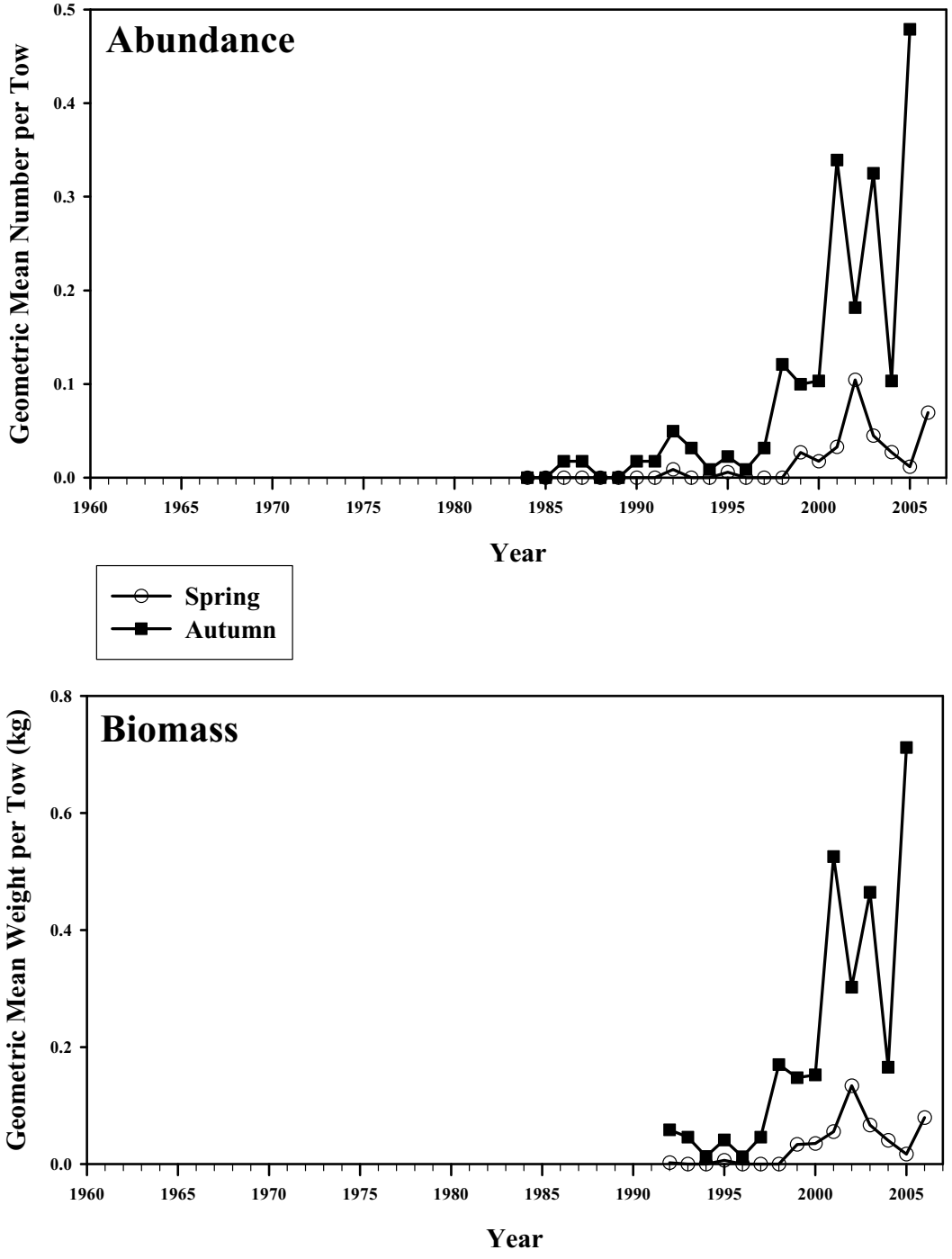


Figure B2.110. Abundance and biomass of clearnose skate from the CTDEP spring and autumn finfish bottom trawl survey in Connecticut state waters, 1984-2006.

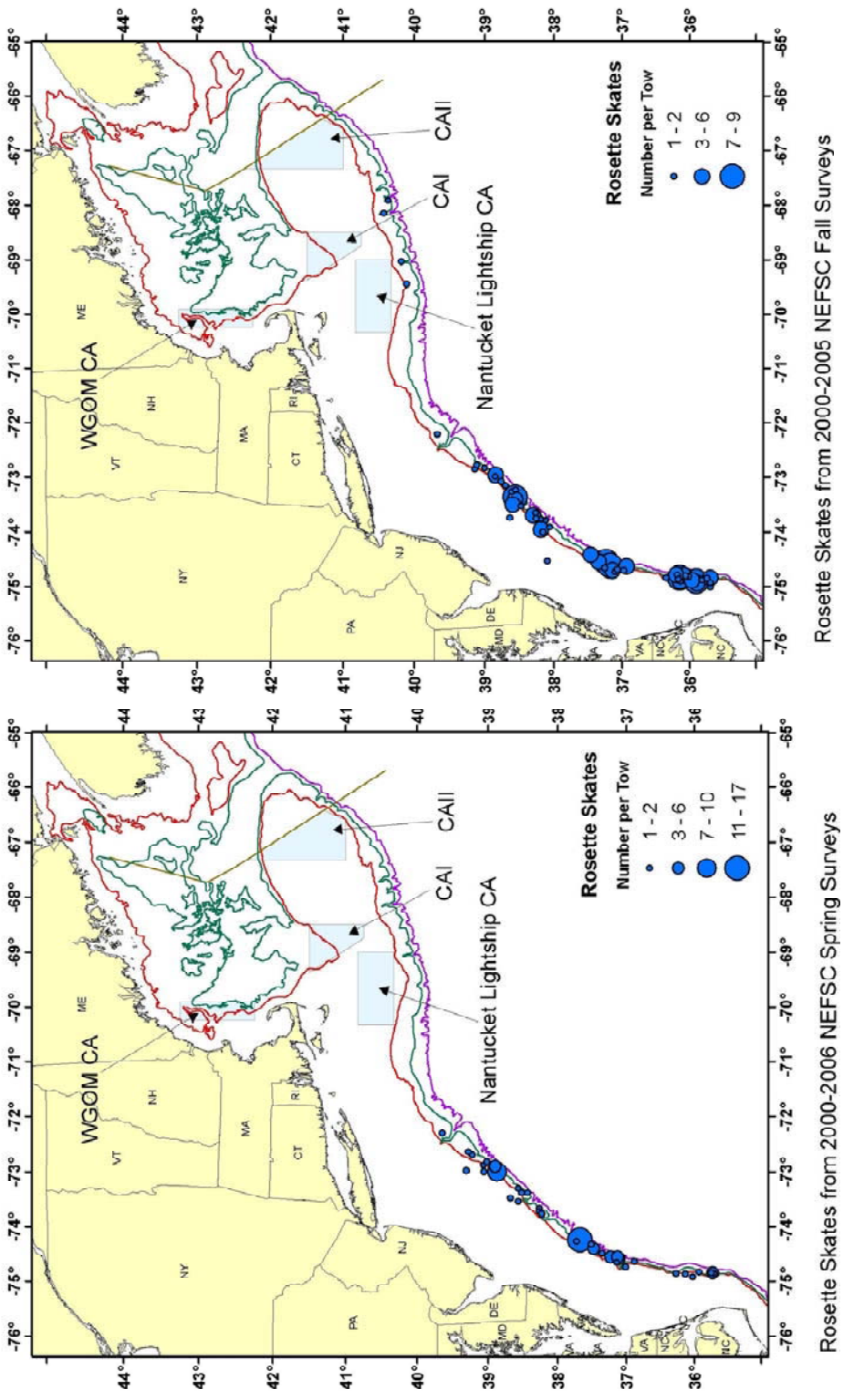
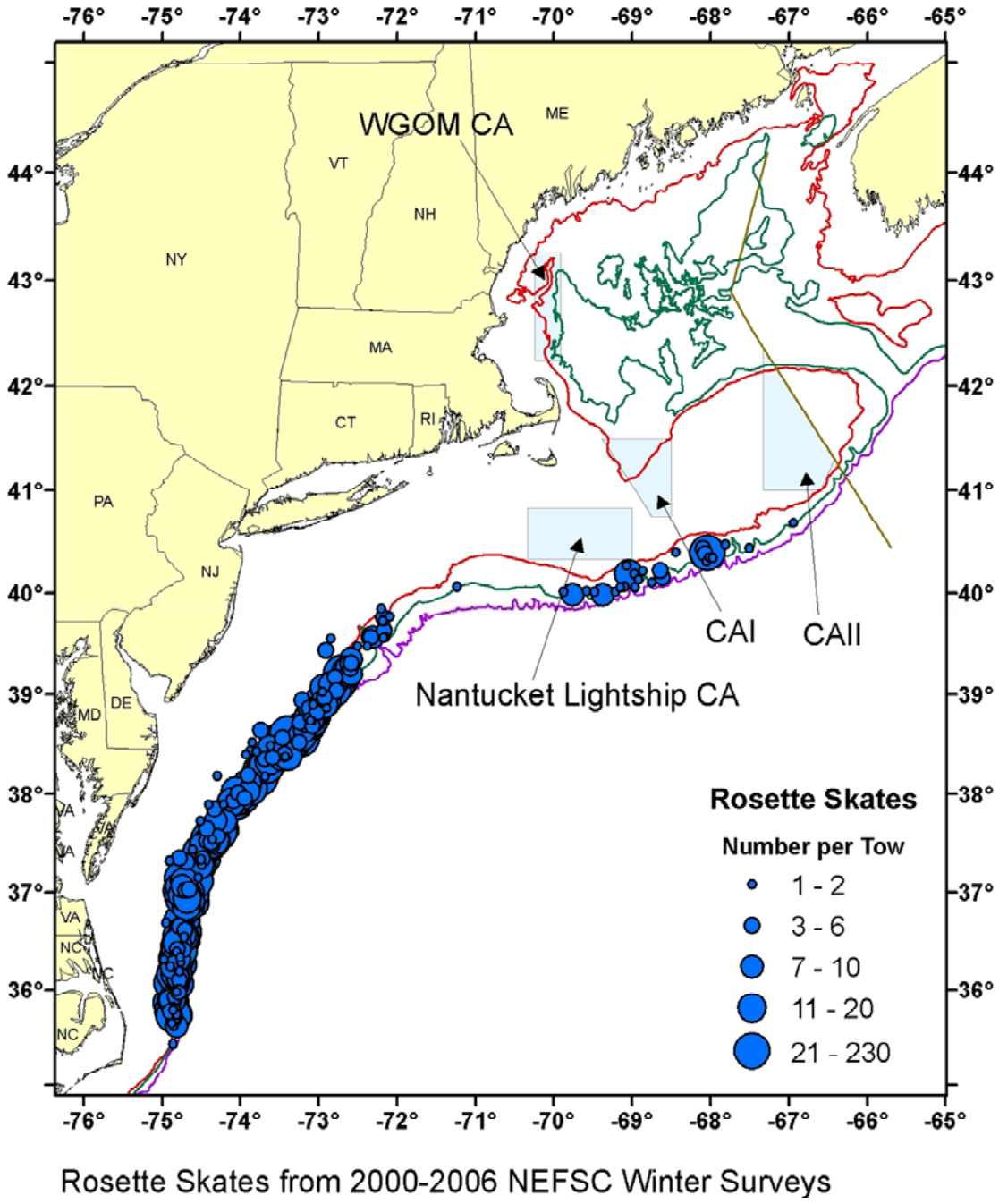


Figure B2.111. Distribution of rosette skate from the spring and autumn NEFSC surveys from 2000-2006.



Rosette Skates from 2000-2006 NEFSC Winter Surveys

Figure B2.112. Distribution of rosette skate from the winter NEFSC surveys from 2000-2006.

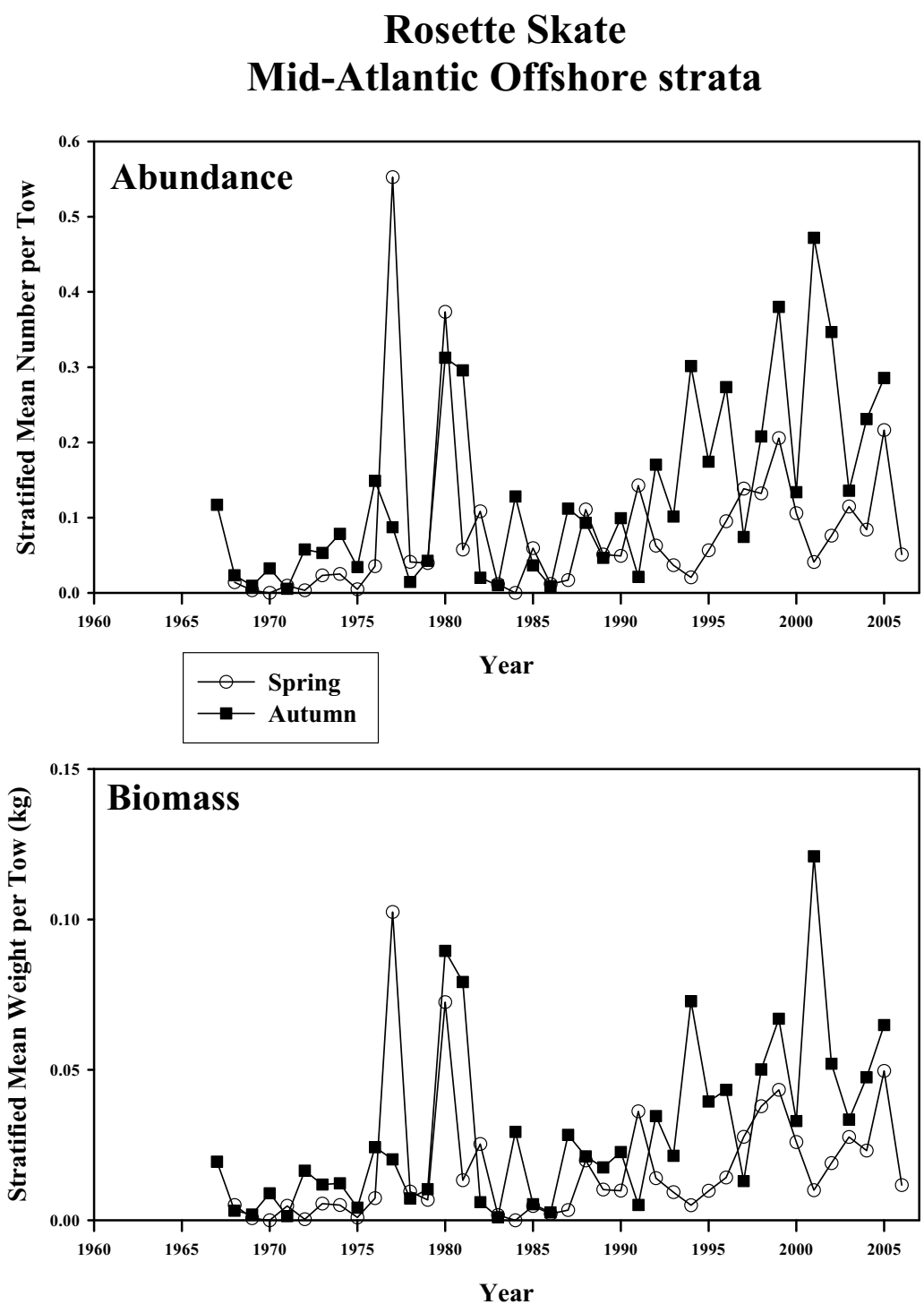


Figure B2.113. Abundance and biomass of rosette skate from the NESFC spring (circles) and autumn (squares) bottom trawl surveys from 1967-2006 in the Mid-Atlantic offshore region.

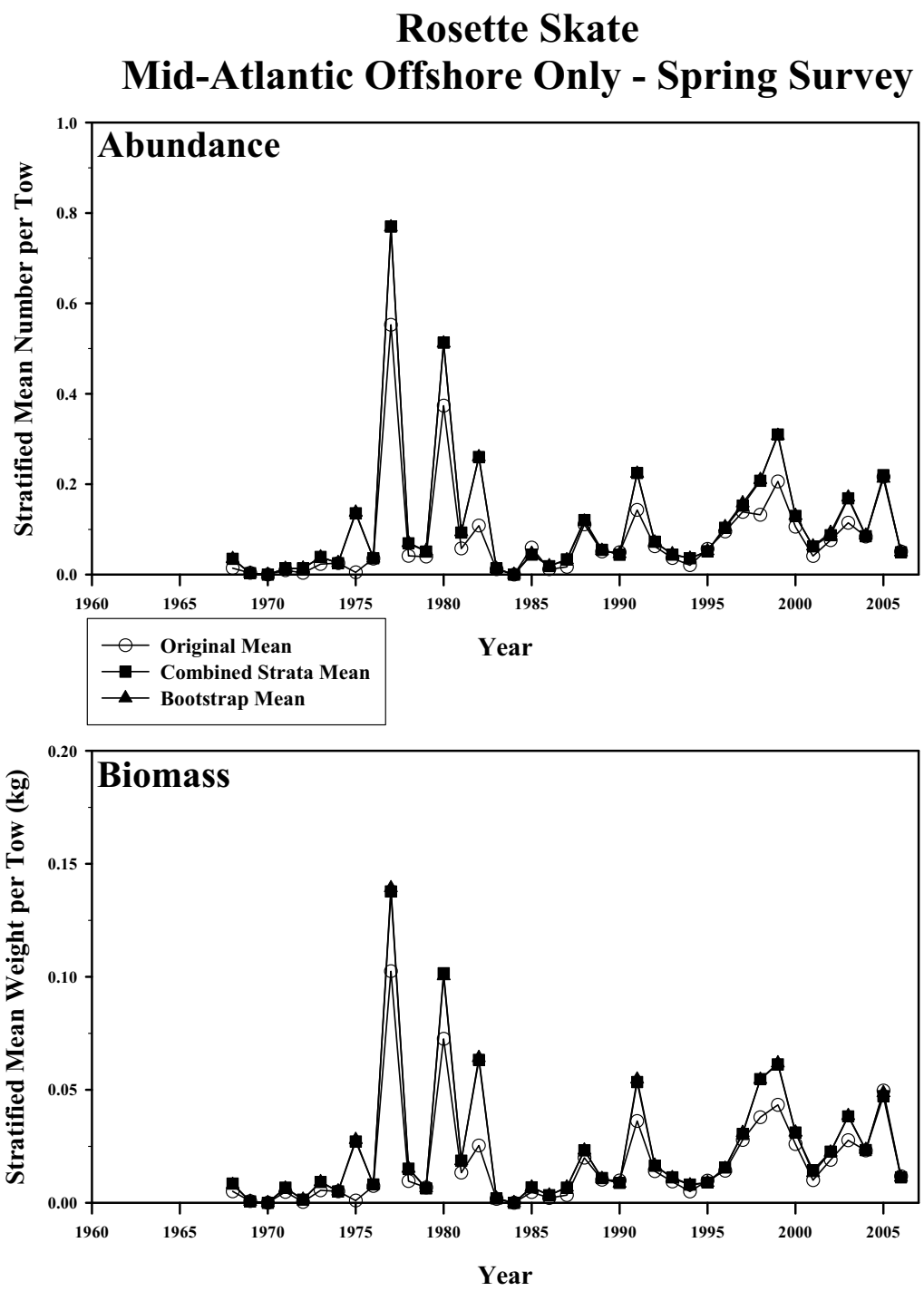


Figure B2.114. Abundance and biomass of rosette skate from the NESFC spring bottom trawl surveys from 1968-2006 in the Mid-Atlantic offshore region. The circles represent the original stratified mean, the squares represent the mean combining strata for bootstrapping, and the triangles represent the bootstrapped mean.

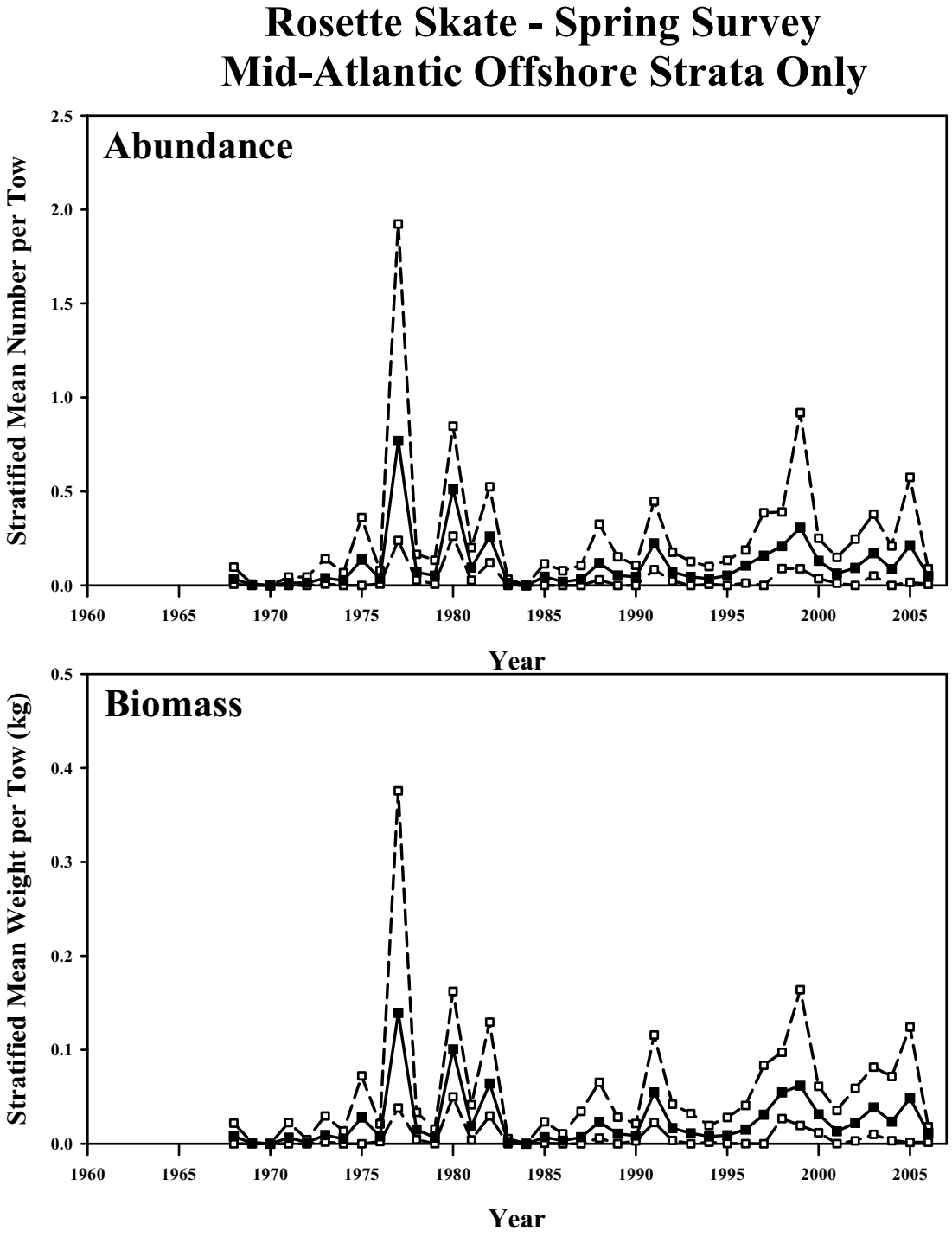


Figure B2.115. Bootstrapped abundance and biomass of rosette skate from the NESFC spring bottom trawl survey in the Mid-Atlantic offshore region. Mean index in solid squares, 95% confidence interval in open squares.

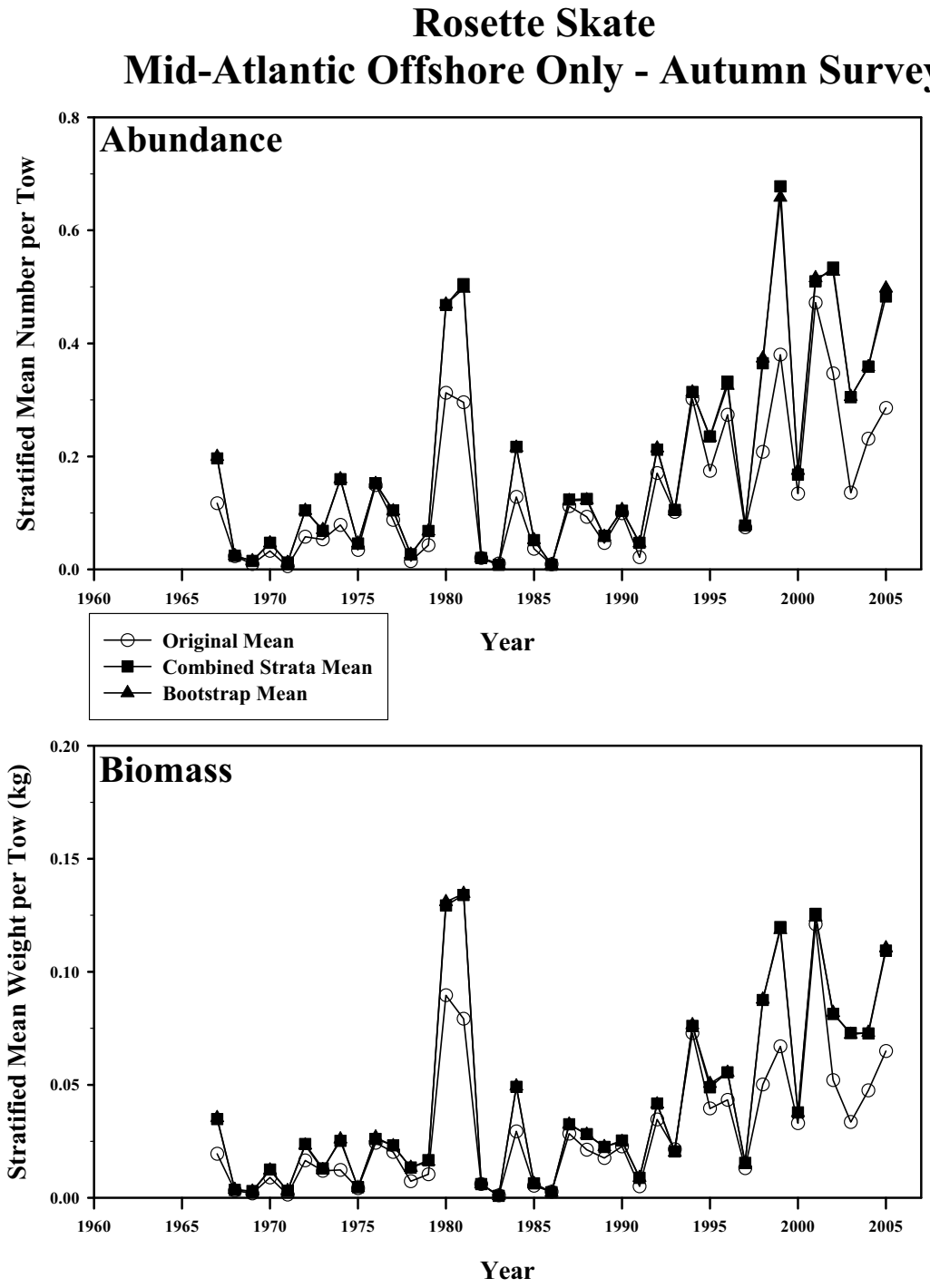


Figure B2.116. Abundance and biomass of rosette skate from the NESFC autumn bottom trawl surveys from 1967-2005 in the Mid-Atlantic offshore region. The circles represent the original stratified mean, the squares represent the mean combining strata for bootstrapping, and the triangles represent the bootstrapped mean.

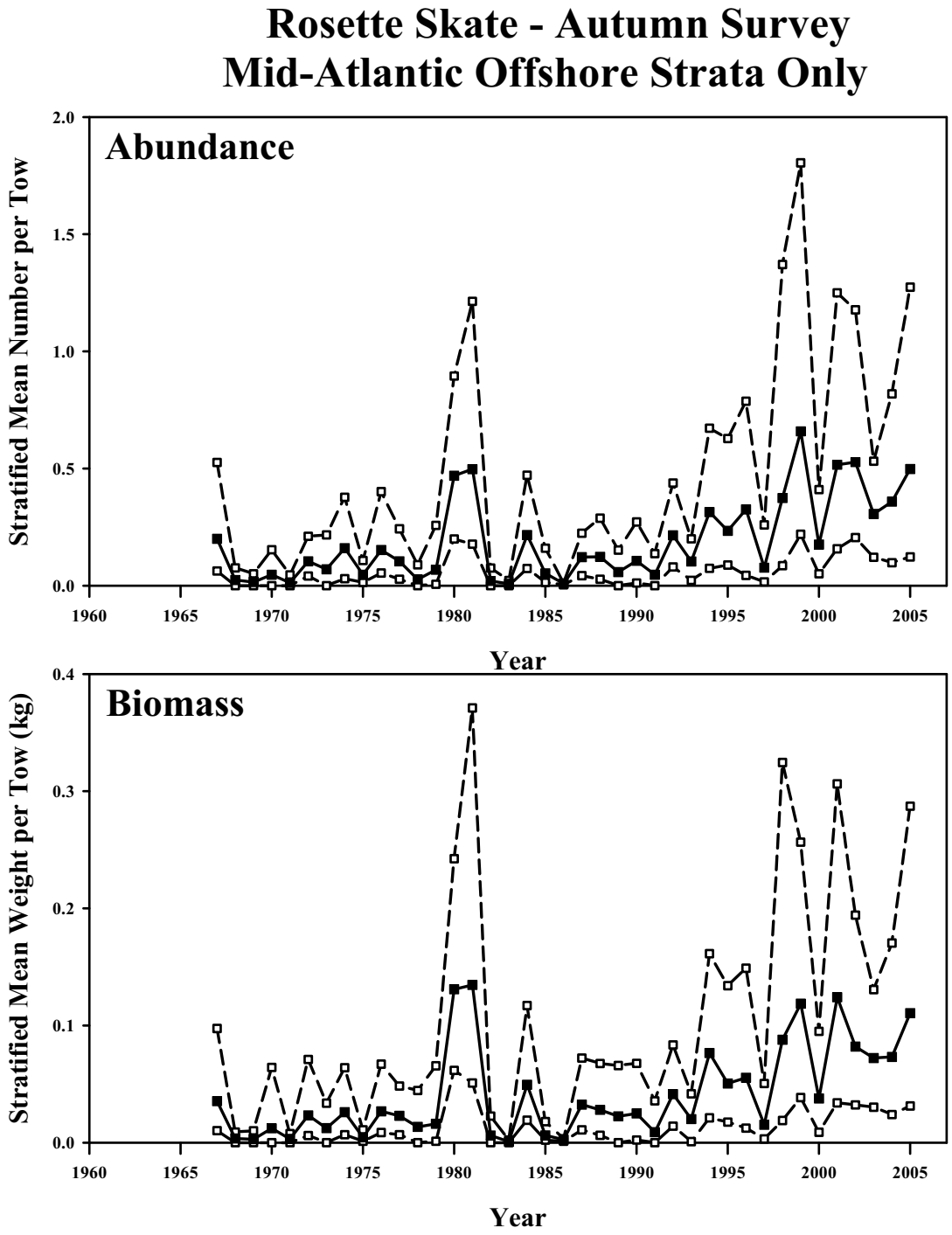


Figure B2.117. Bootstrapped abundance and biomass of rosette skate from the NESFC autumn bottom trawl survey in the Mid-Atlantic offshore region. Mean index in solid squares, 95% confidence interval in open squares.

Rosette Skate
Percentiles of Length Composition

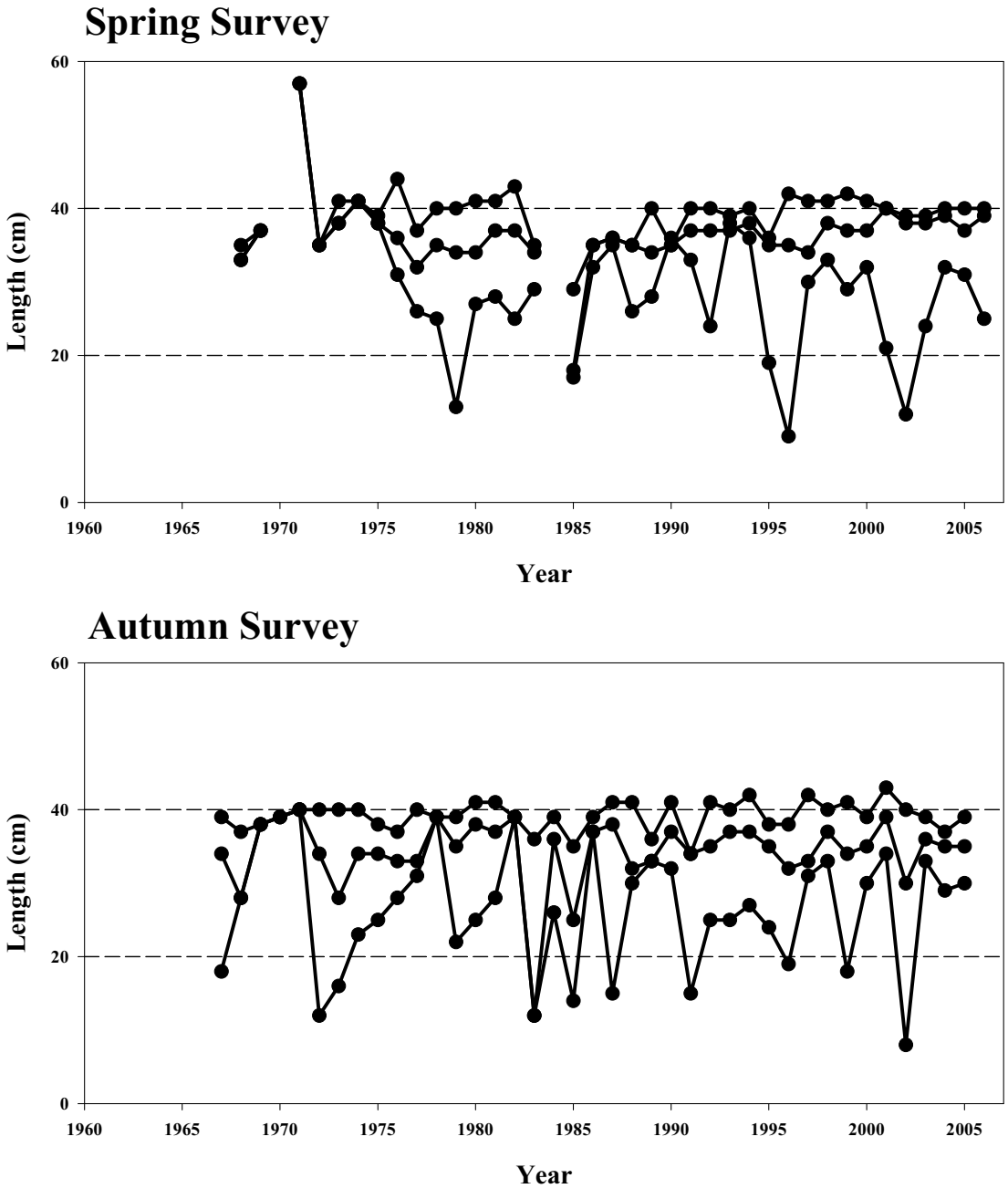


Figure B2.118. Percentiles of length composition (5, 50, and 95) of rosette skate from the NESFC spring and autumn bottom trawl surveys from 1967-2006 in the Mid-Atlantic offshore region.

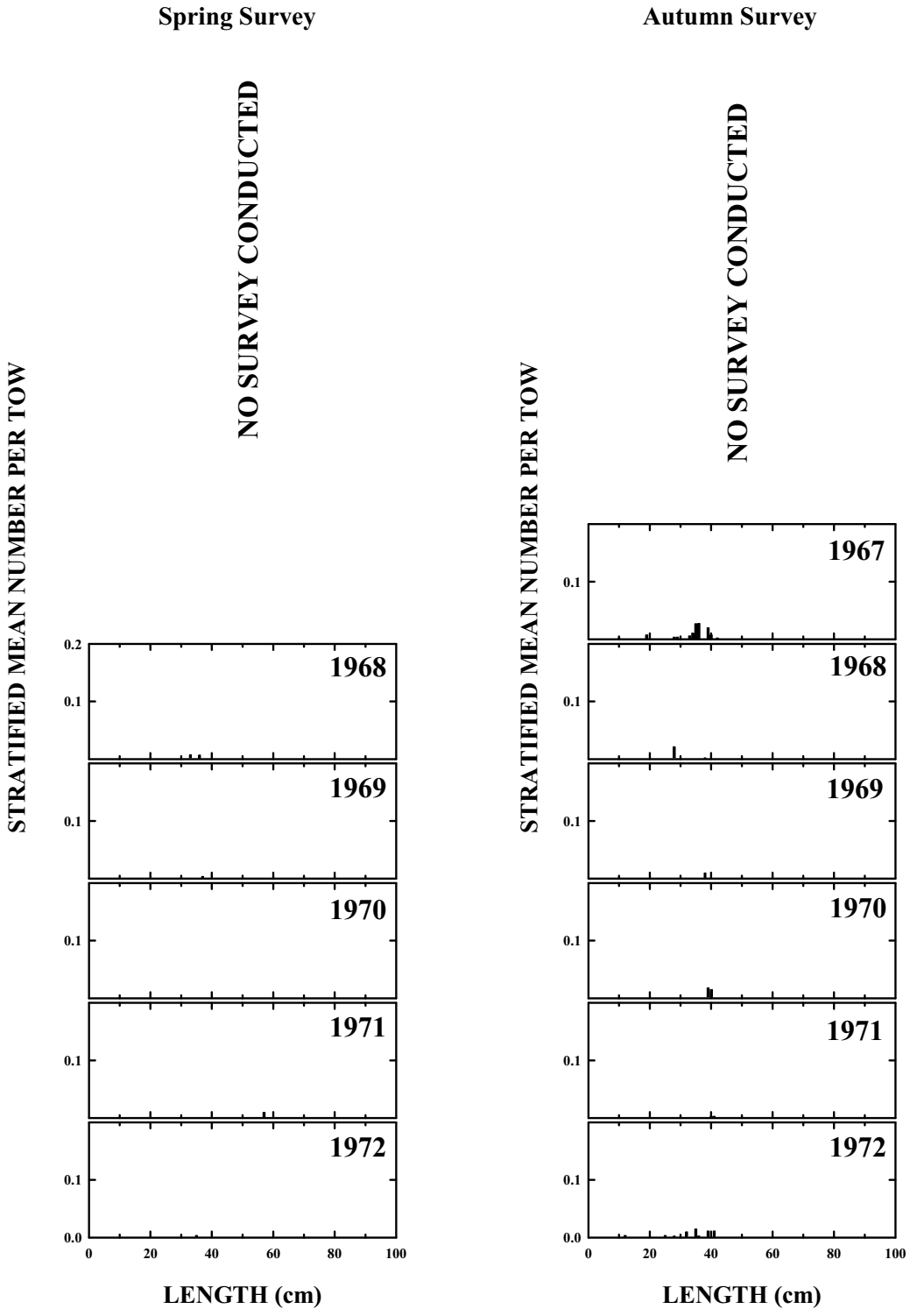


Figure B2.119. Rosette skate length composition from the NEFSC spring and autumn bottom trawl surveys in the Mid-Atlantic offshore region, 1967-1972.

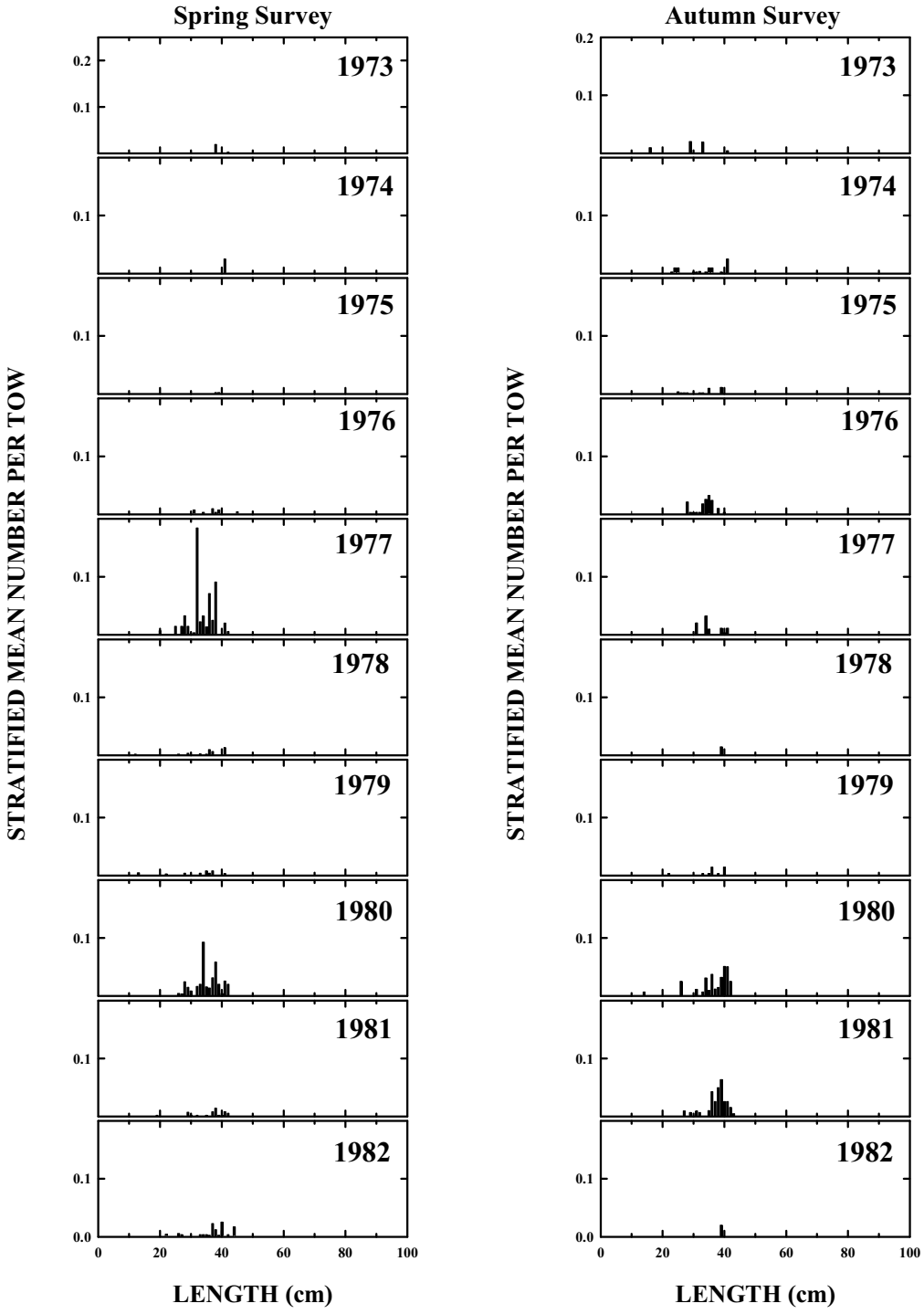


Figure B2.120. Rosette skate length composition from the NEFSC spring and autumn bottom trawl surveys in the Mid-Atlantic offshore region, 1973-1982.

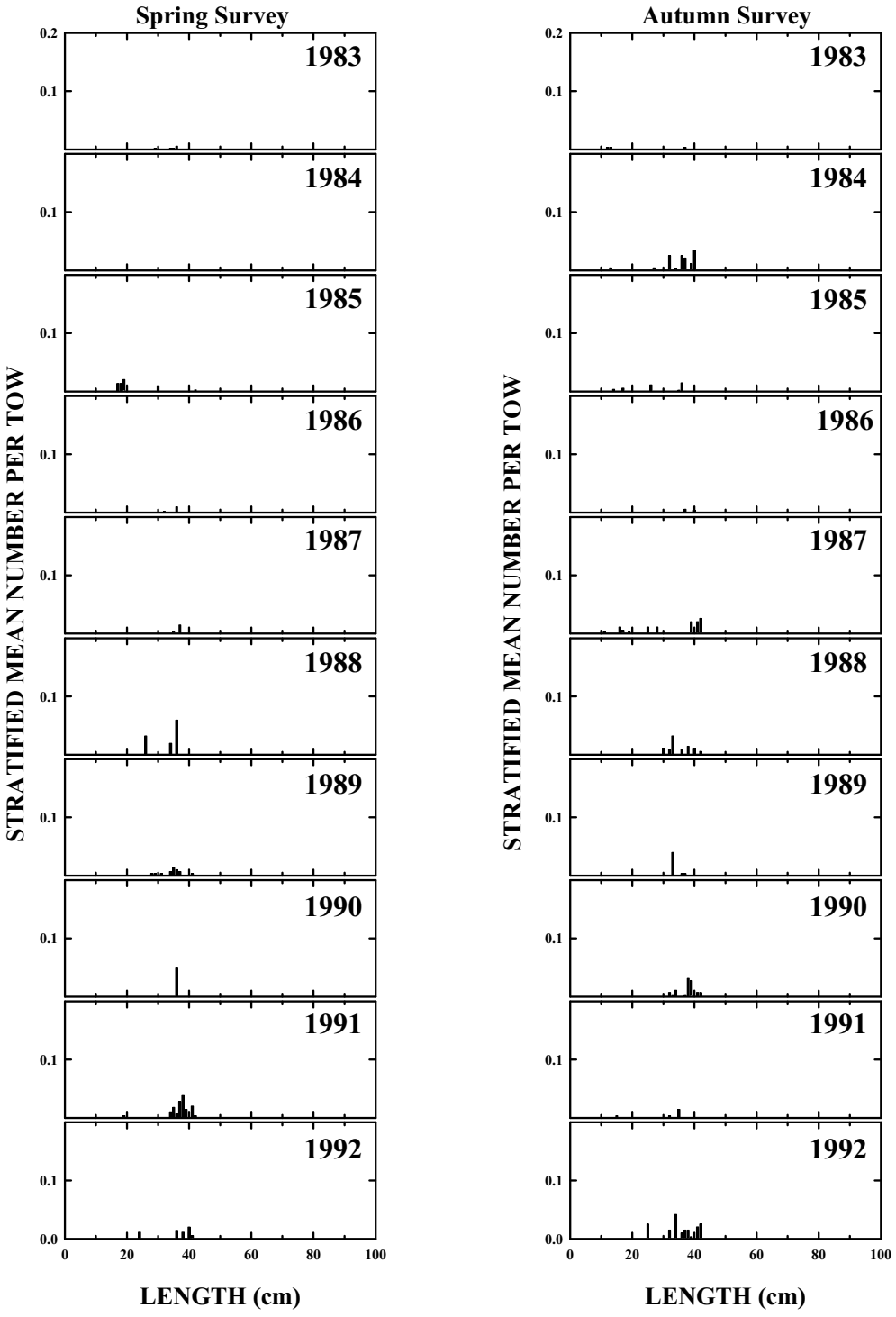


Figure B2.121. Rosette skate length composition from the NEFSC spring and autumn bottom trawl surveys in the Mid-Atlantic offshore region, 1983-1992.

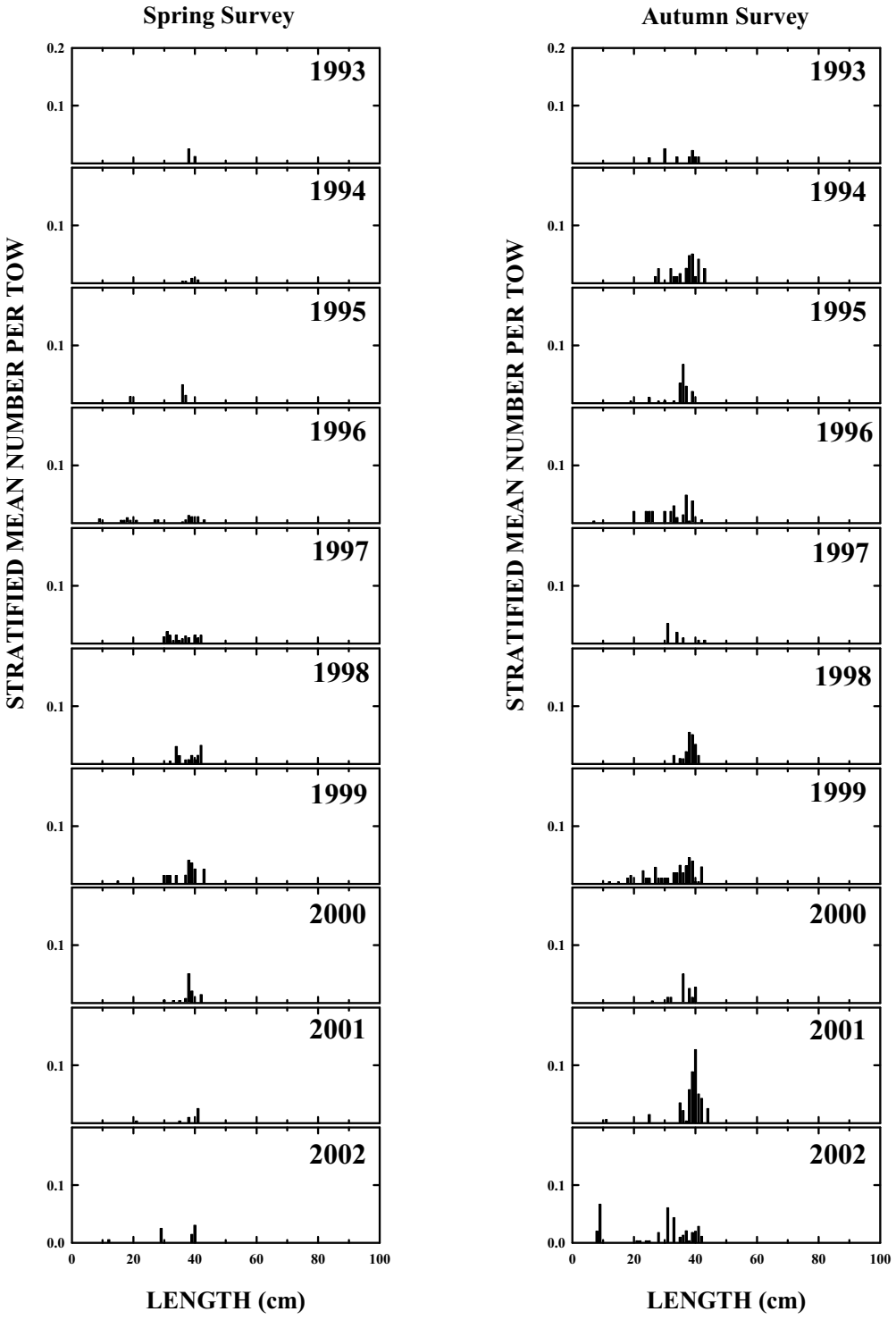


Figure B2.122. Rosette skate length composition from the NEFSC spring and autumn bottom trawl surveys in the Mid-Atlantic offshore region, 1993-2002.

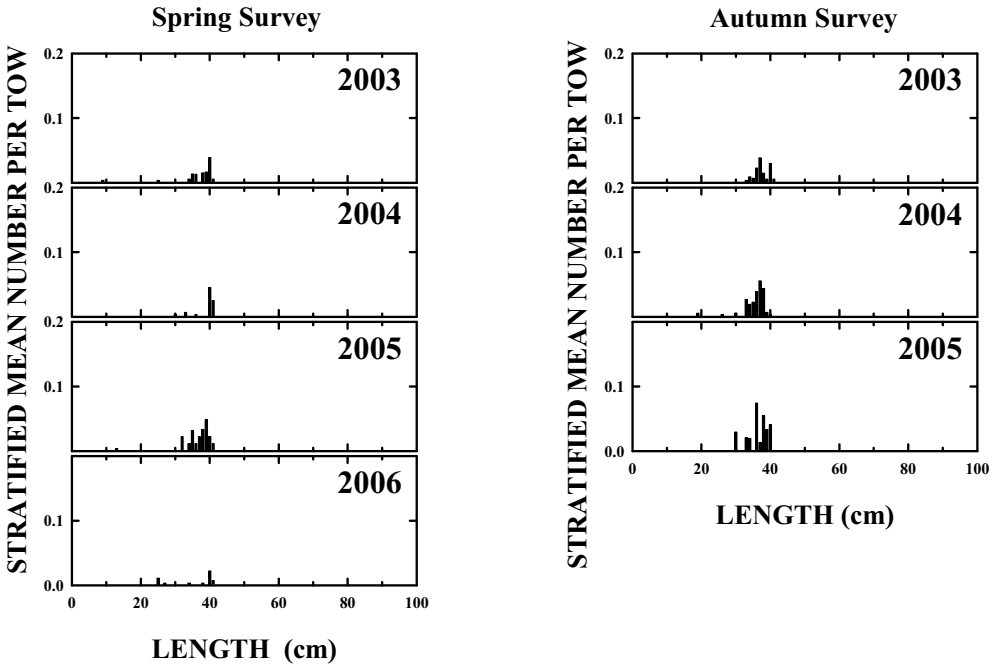


Figure B2.123. Rosette skate length composition from the NEFSC spring and autumn bottom trawl surveys in the Mid-Atlantic offshore region, 2003-2006.

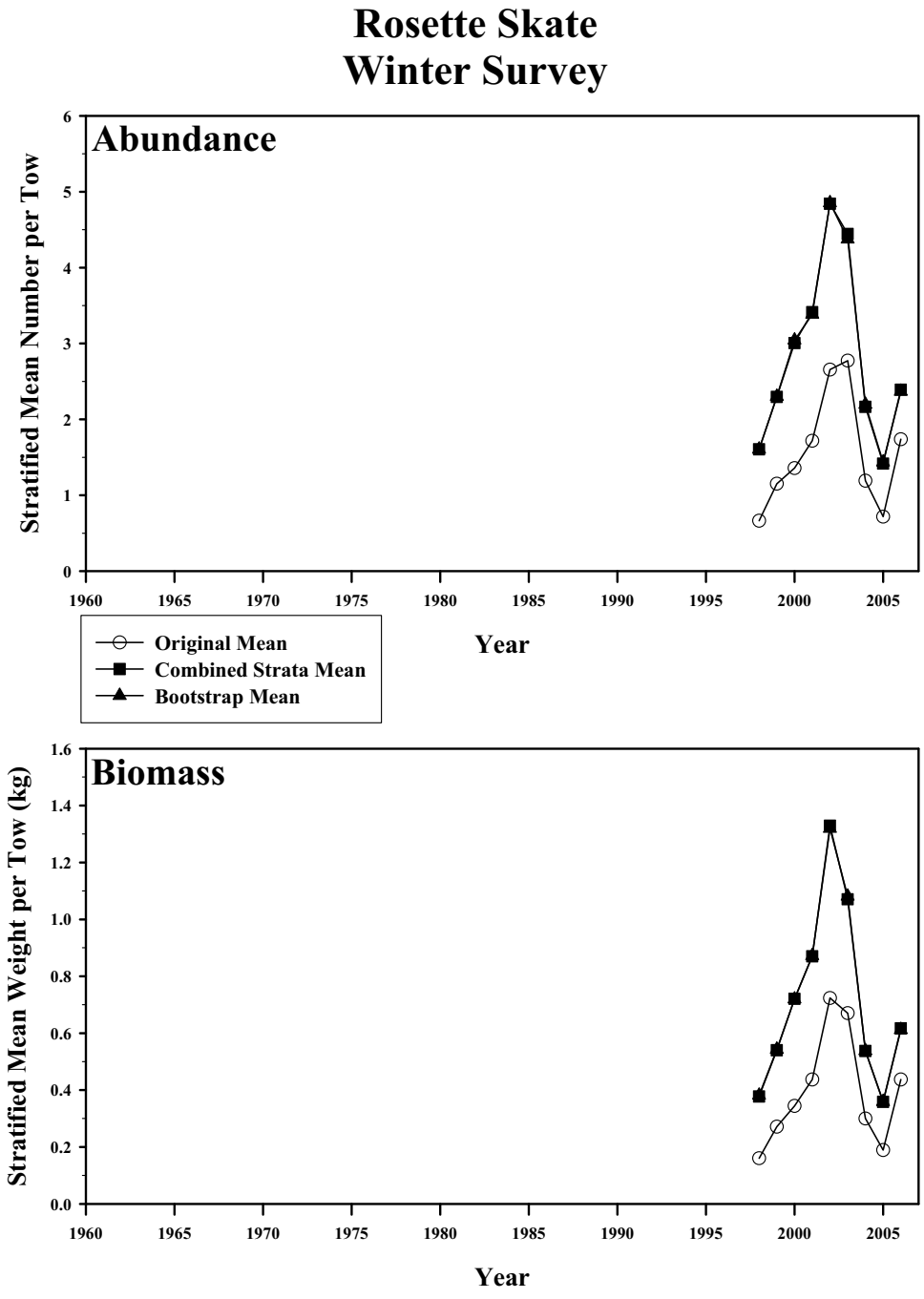


Figure B2.124. Abundance and biomass of rosette skate from the NESFC winter bottom trawl surveys from 1998-2006. The circles represent the original stratified mean, the squares represent the mean combining strata for bootstrapping, and the triangles represent the bootstrapped mean.

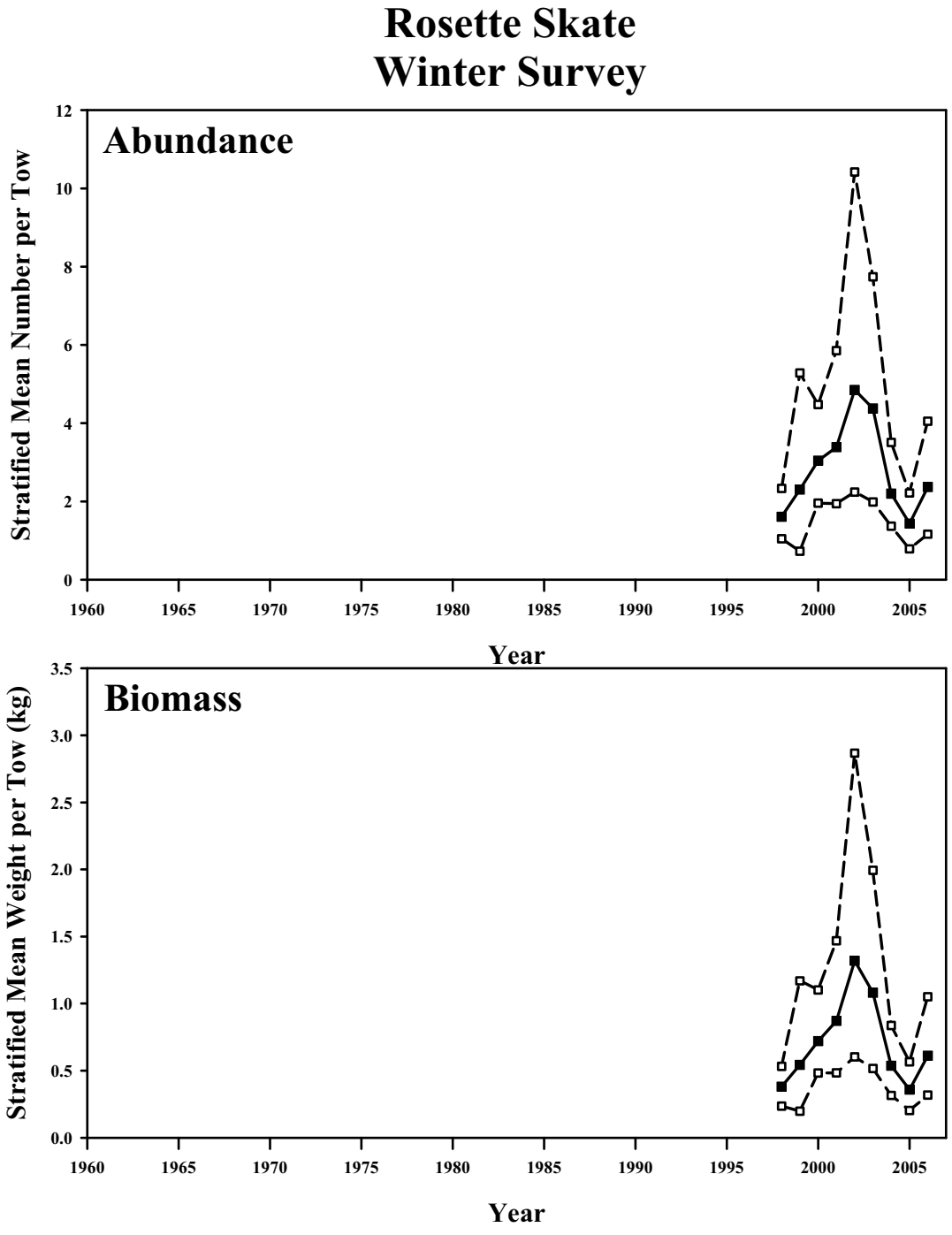


Figure B2.125. Bootstrapped abundance and biomass of rosette skate from the NESFC winter bottom trawl survey. Mean index in solid squares, 95% confidence interval in open squares.

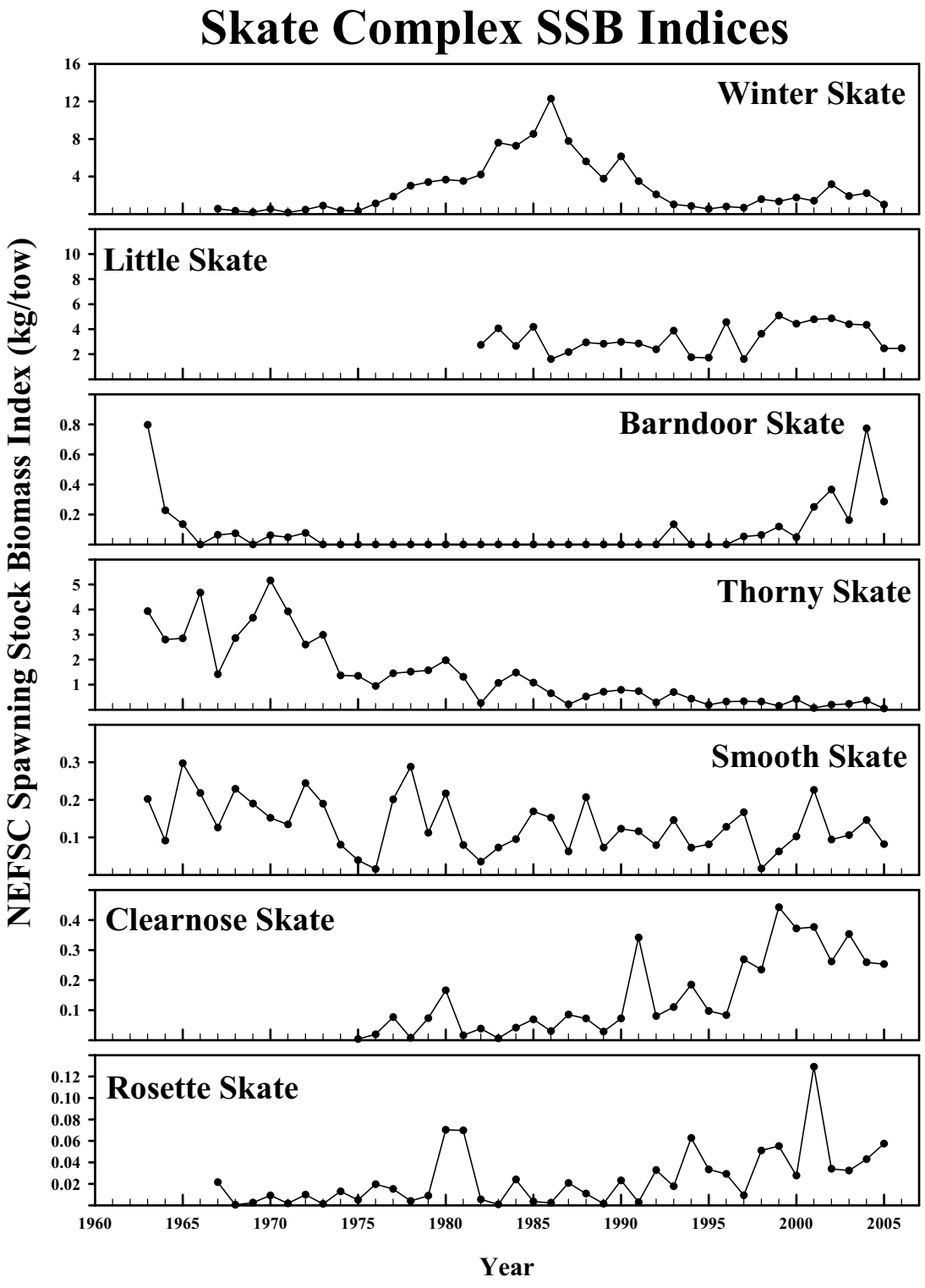


Figure B2.126. Trends in spawning stock biomass indices for seven species of skates.

FIGURES B2.127-B2.141.

(EDITOR'S NOTE: BASED ON THE REVIEWER'S COMMENTS, THESE FIGURES WERE NOT INCLUDED IN THIS REPORT. THE FIGURES DEALT WITH ESTIMATES OF FISHING MORTALITY RATE.)

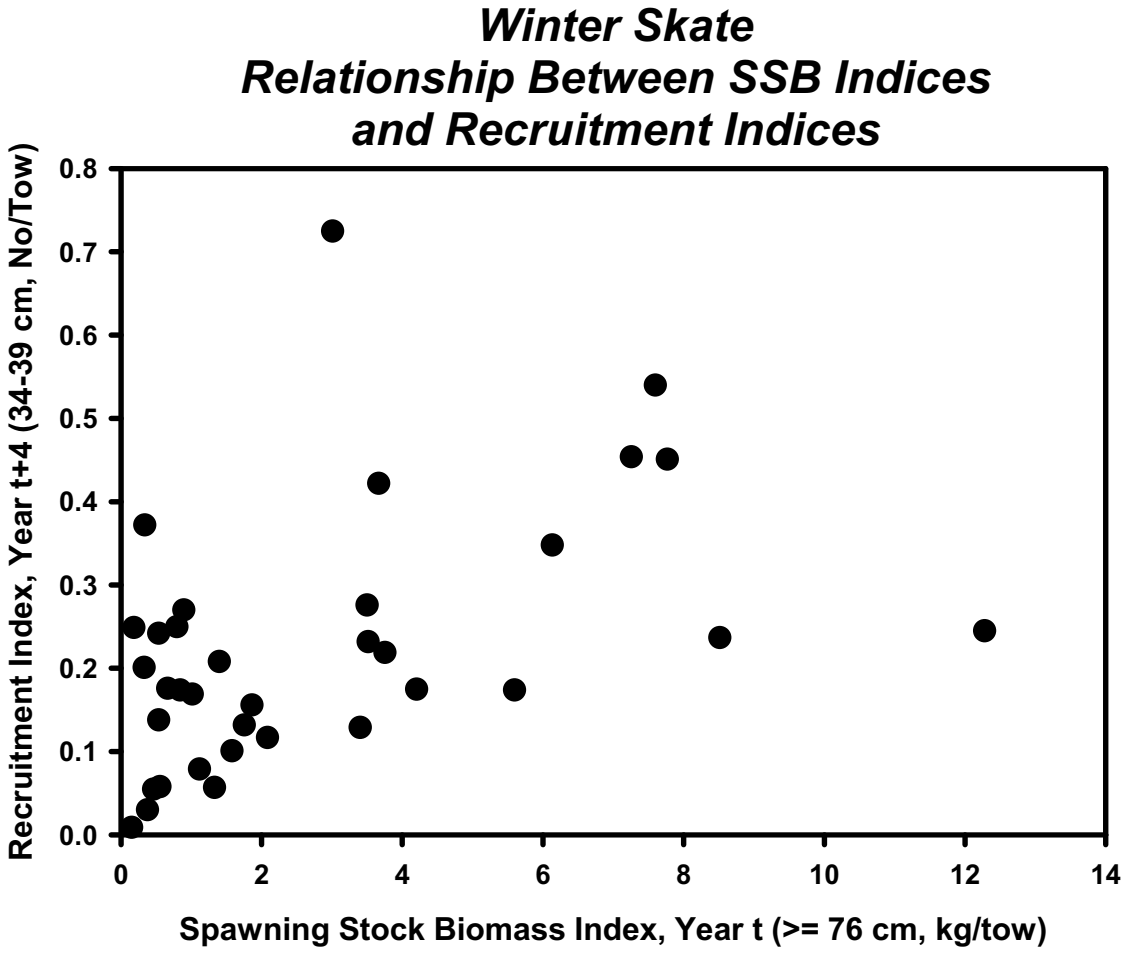


Figure B3.1. Relationship between spawning stock biomass indices (>= 76 cm) and recruitment indices (no/tow, 34-39 cm) for winter skate. The time lag between SSB and recruitment accounts for the assumed age 3 at recruitment plus one year for hatching time.

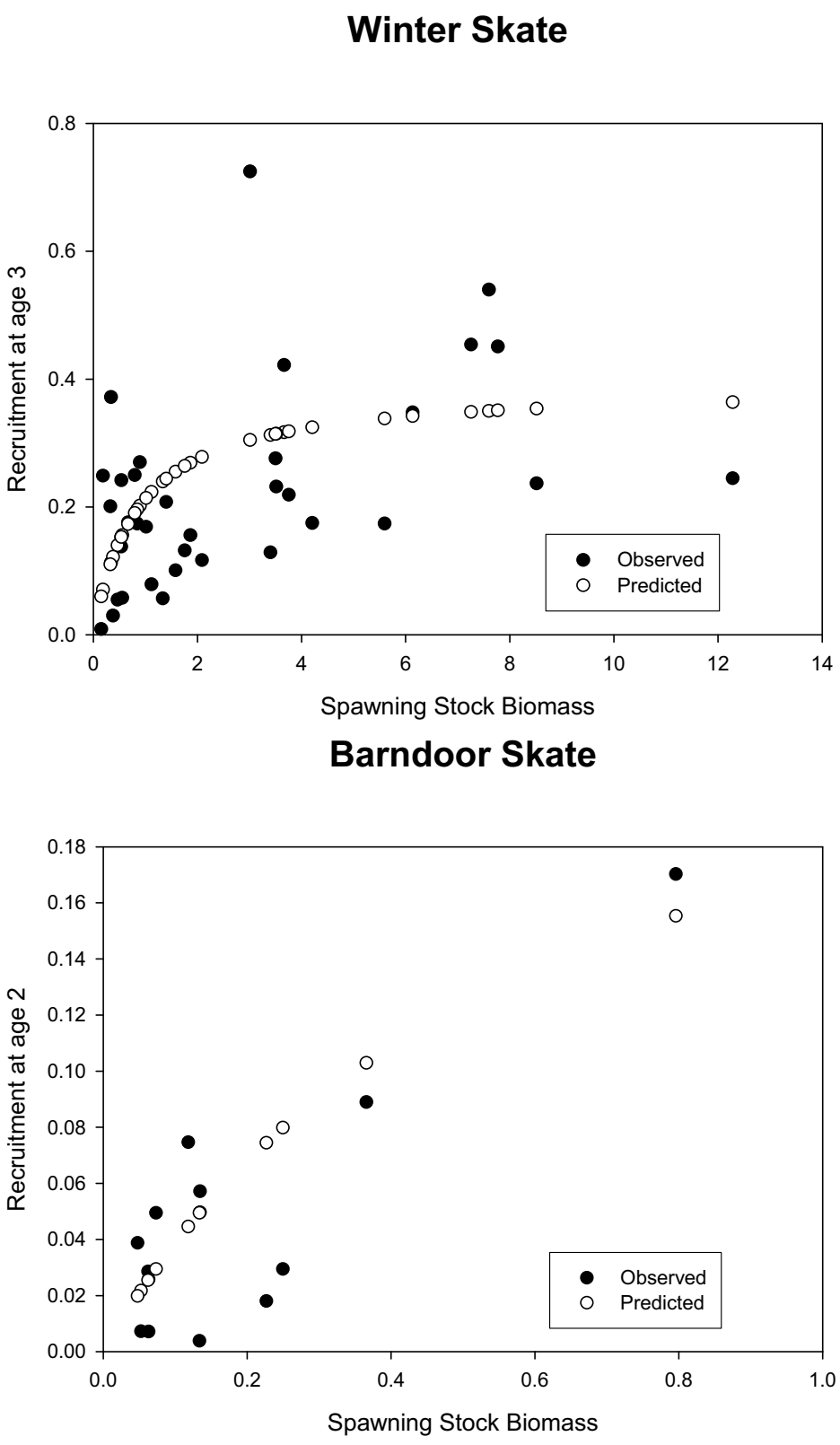


Figure B3.2. Stock-recruitment plots for winter skate and barndoor skate with the Beverton-Holt function plotted.

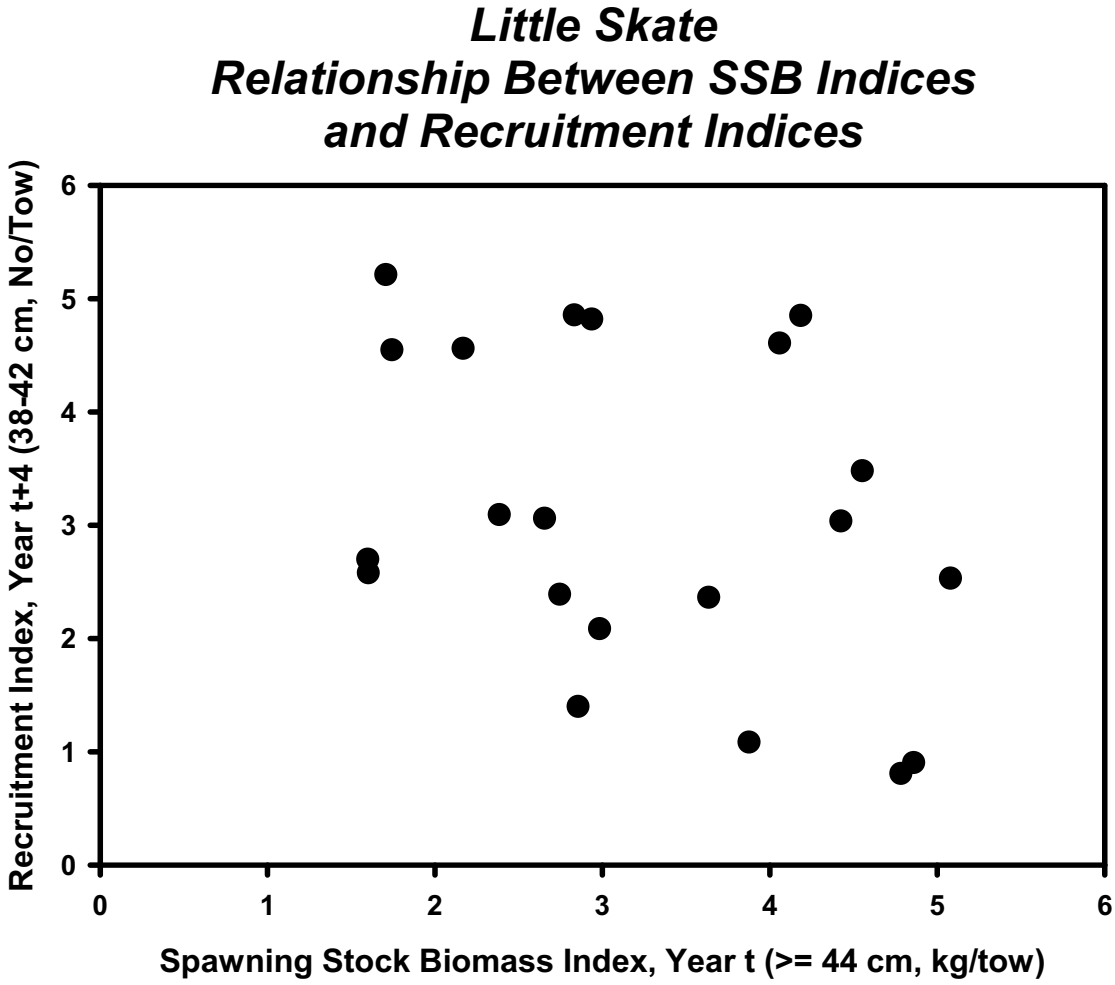


Figure B.3.3. Relationship between spawning stock biomass indices (>= 44 cm) and recruitment indices (no/tow, 38-42 cm) for little skate. The time lag between SSB and recruitment accounts for the assumed age 3 at recruitment plus one year for hatching time.

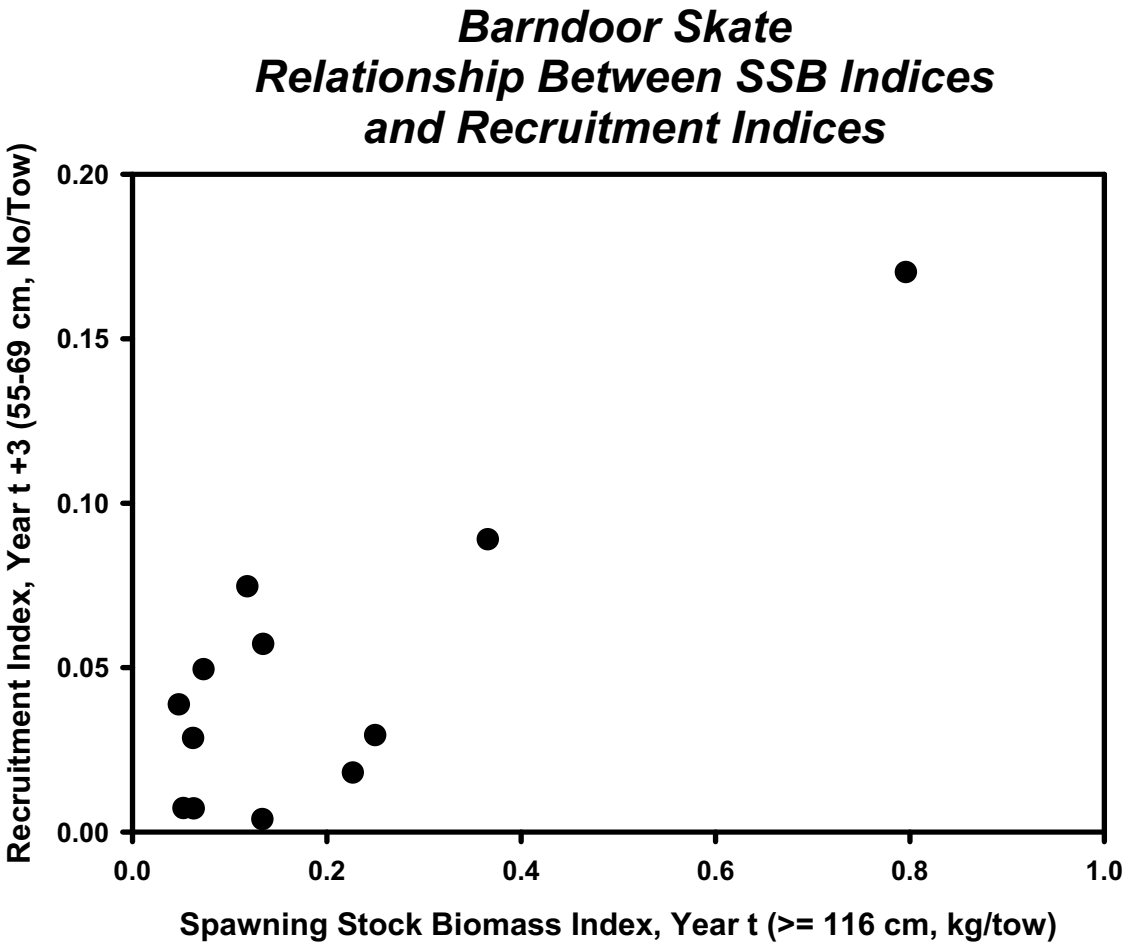


Figure B3.4. Relationship between spawning stock biomass indices (>= 116 cm) and recruitment indices (no/tow, 55-69 cm) for barndoor skate. The time lag between SSB and recruitment accounts for the assumed age 2 at recruitment plus one year for hatching time.

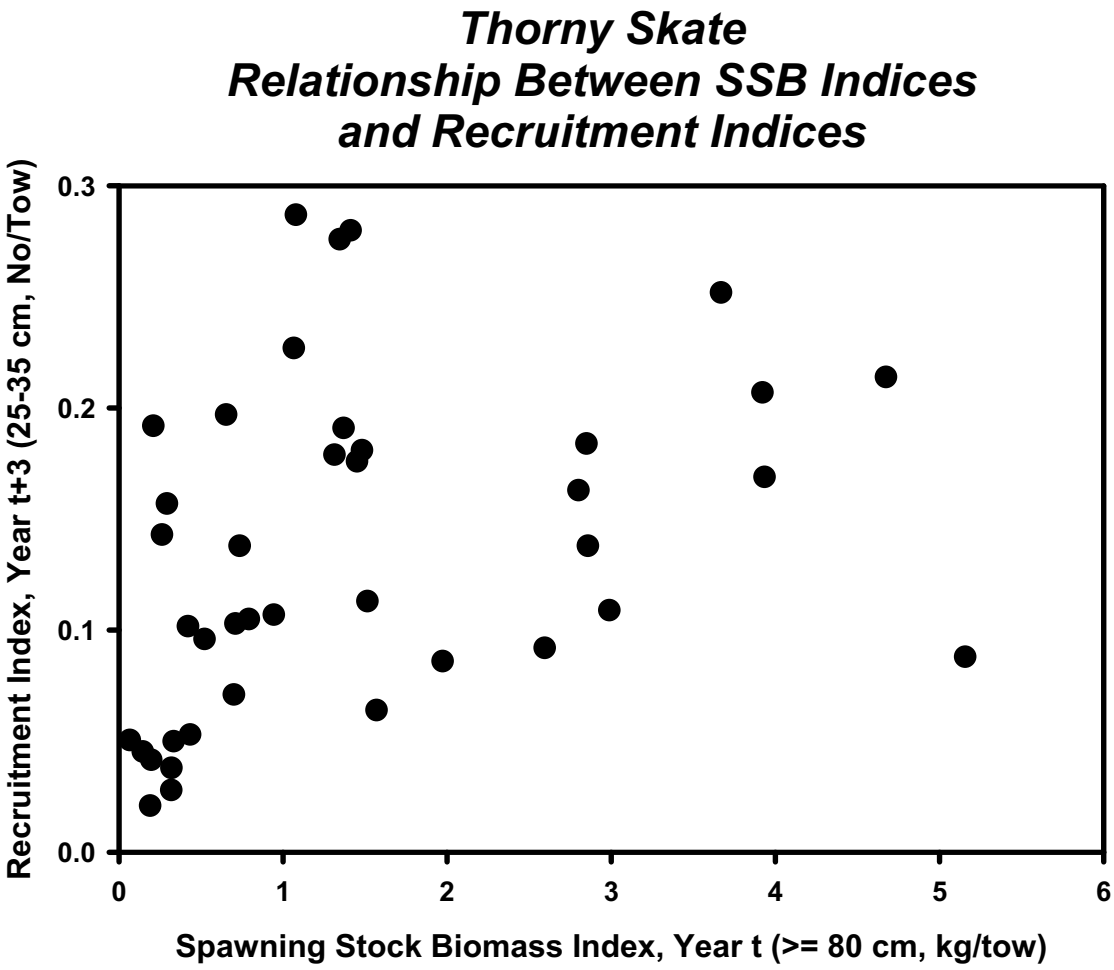


Figure B3.5. Relationship between spawning stock biomass indices (>= 80 cm) and recruitment indices (no/tow, 25-35 cm) for thorny skate. The time lag between SSB and recruitment accounts for the assumed age 2 at recruitment plus one year for hatching time.

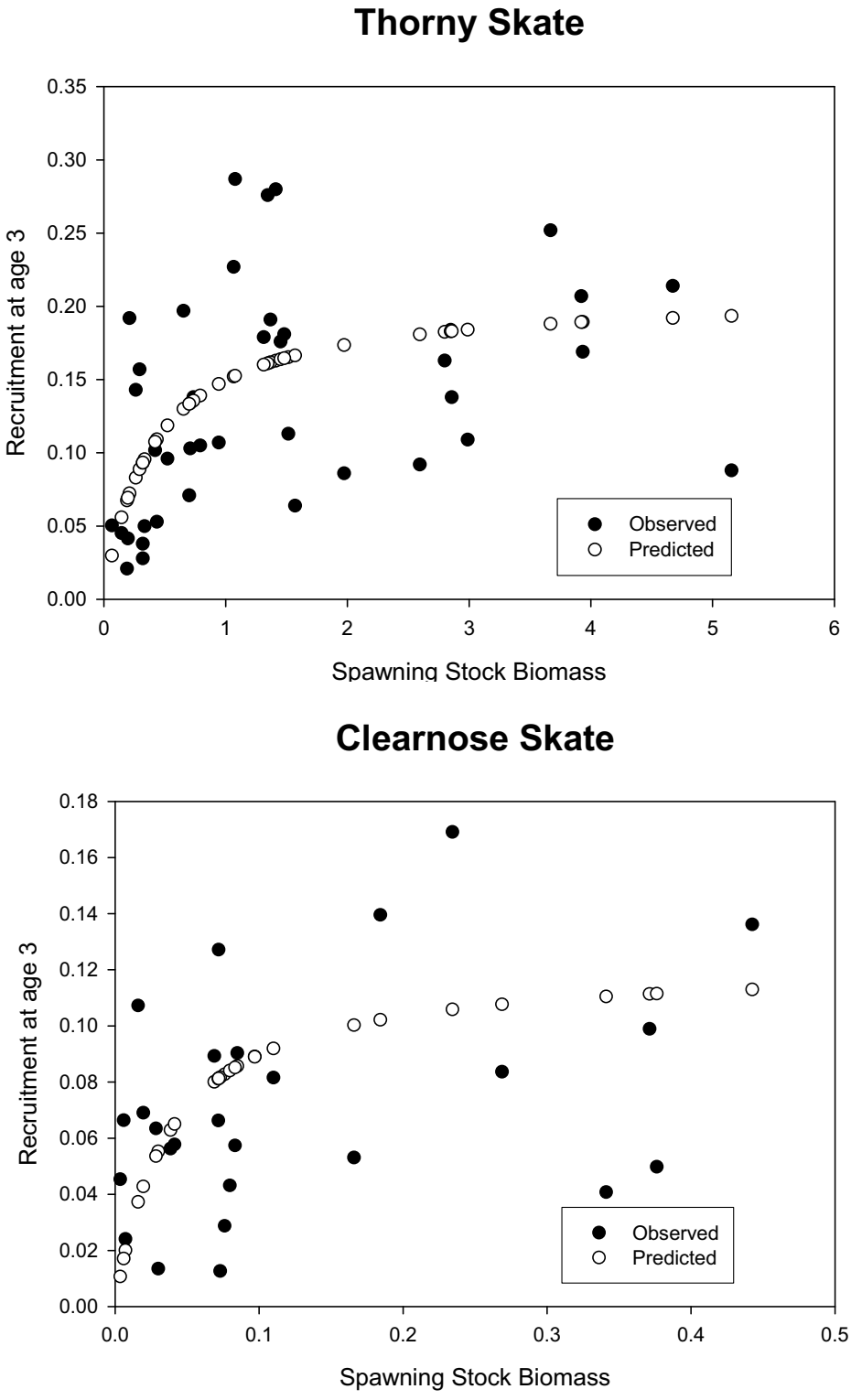


Figure B3.6. Stock-recruitment plots for thorny skate and clearnose skate with the Beverton-Holt function plotted.

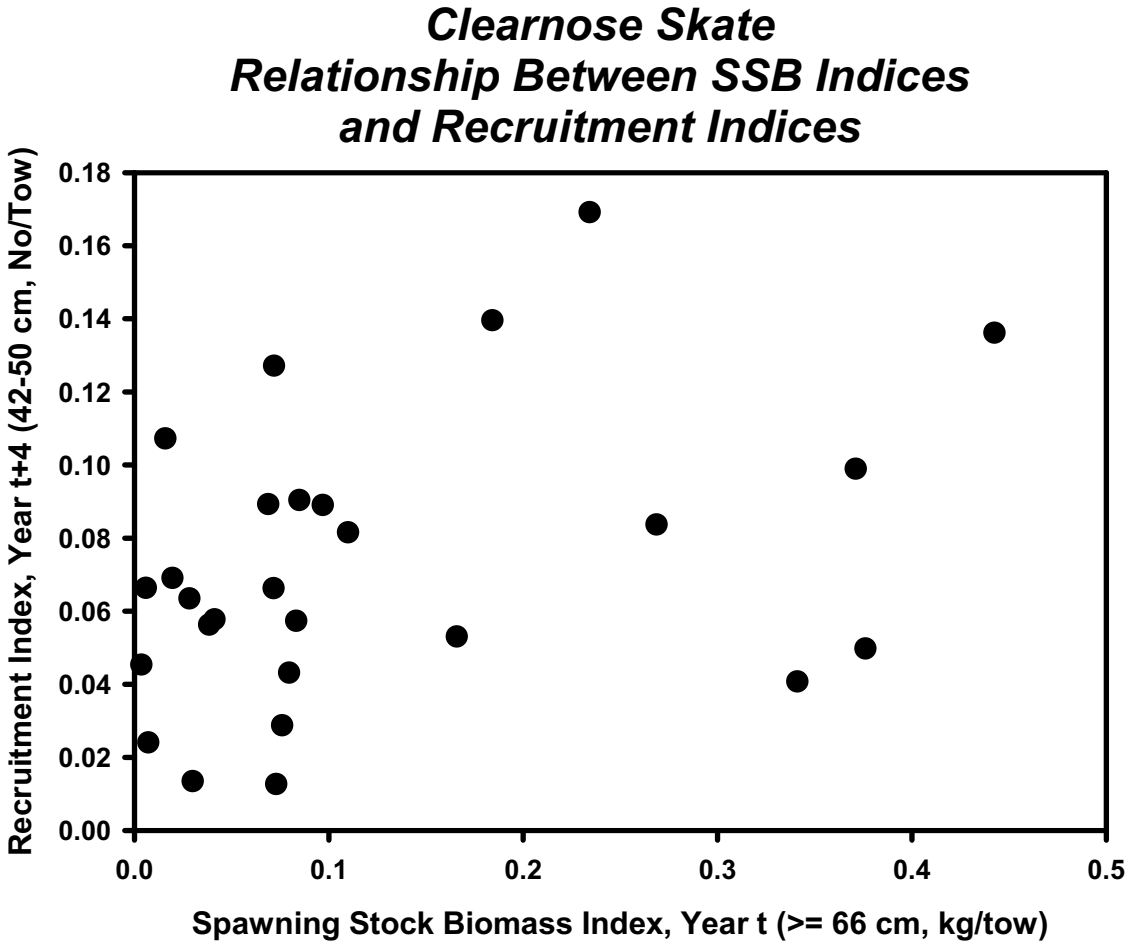


Figure B3.7. Relationship between spawning stock biomass indices (>= 66 cm) and recruitment indices (no/tow, 42-50 cm) for clearnose skate. The time lag between SSB and recruitment accounts for the assumed age 3 at recruitment plus one year for hatching time.

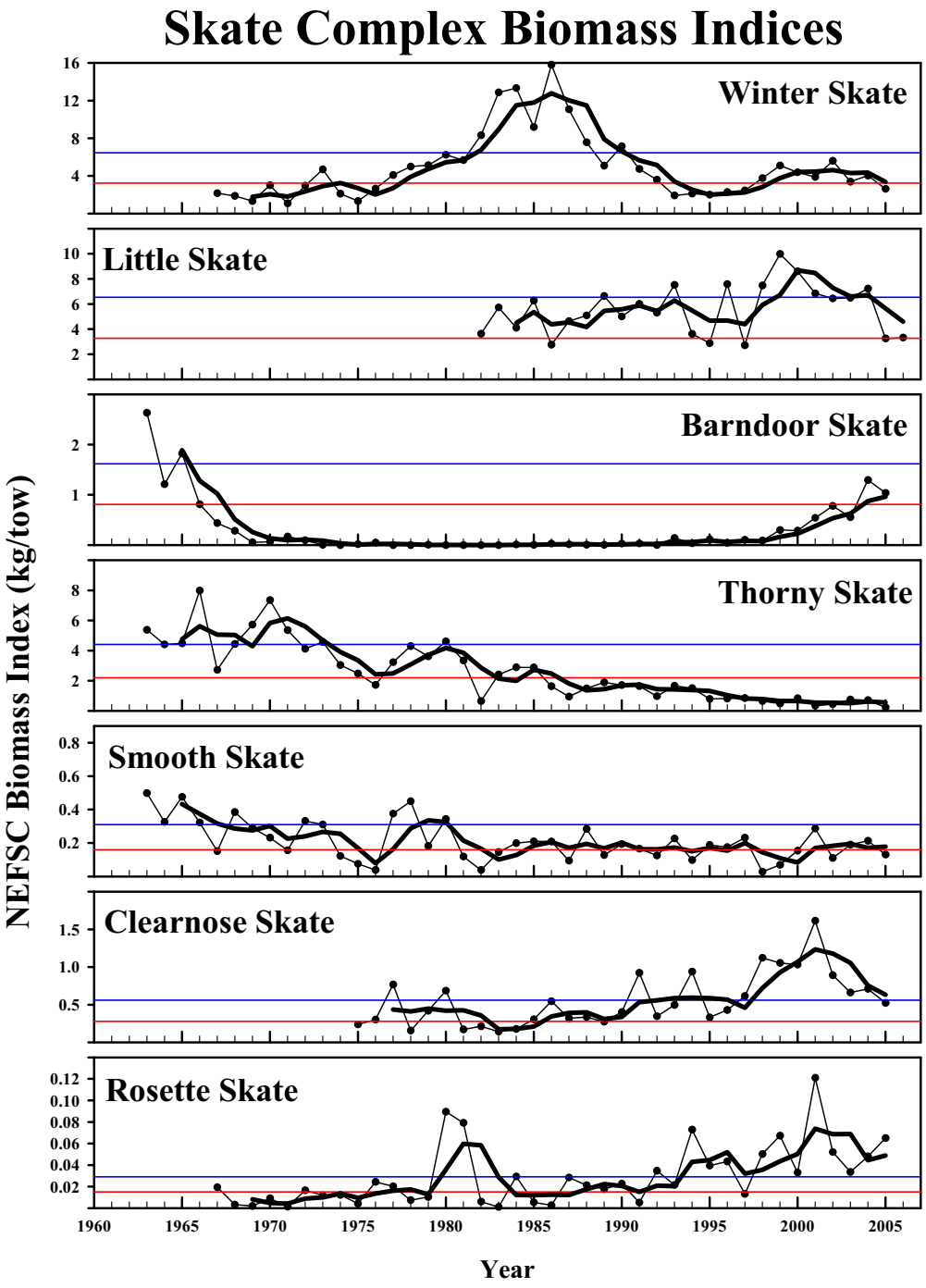


Figure B4.1. NEFSC survey biomass indices (kg/tow). Thin lines with symbols are annual indices, thick lines are 3-year moving averages, the thin horizontal lines are the current biomass targets and thresholds.

FIGURES B4.2 – B4.21.

(EDITOR'S NOTE: BASED ON THE REVIEWER'S COMMENTS, THESE FIGURES WERE NOT INCLUDED IN THIS REPORT. THE FIGURES DEALT WITH ESTIMATES OF ALTERNATIVE BIOLOGICAL REFERENCE POINTS FOR SKATES.)

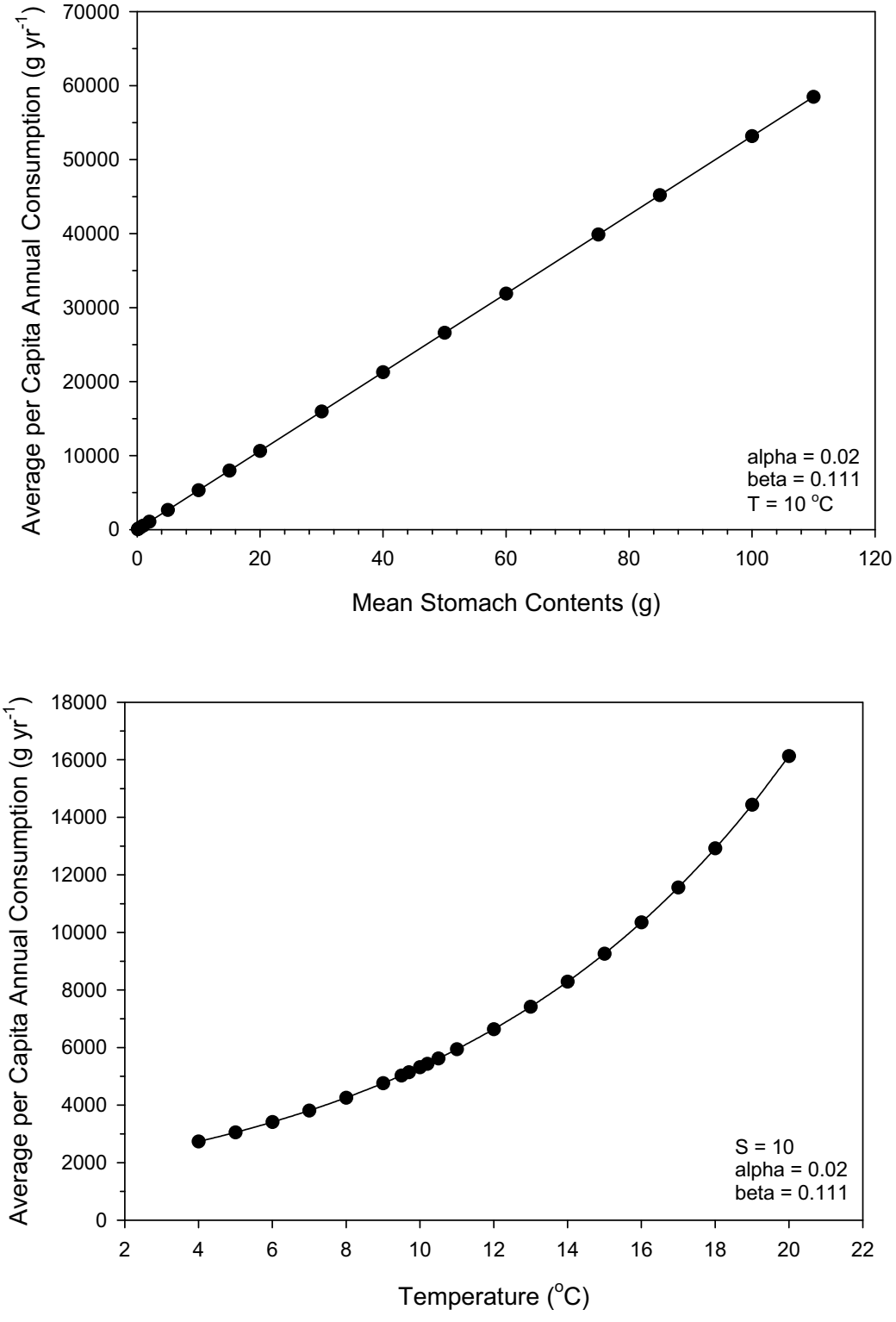


Figure B6.1. Sensitivity of Average per Capita Annual Consumption to a) mean stomach contents and b) temperature.

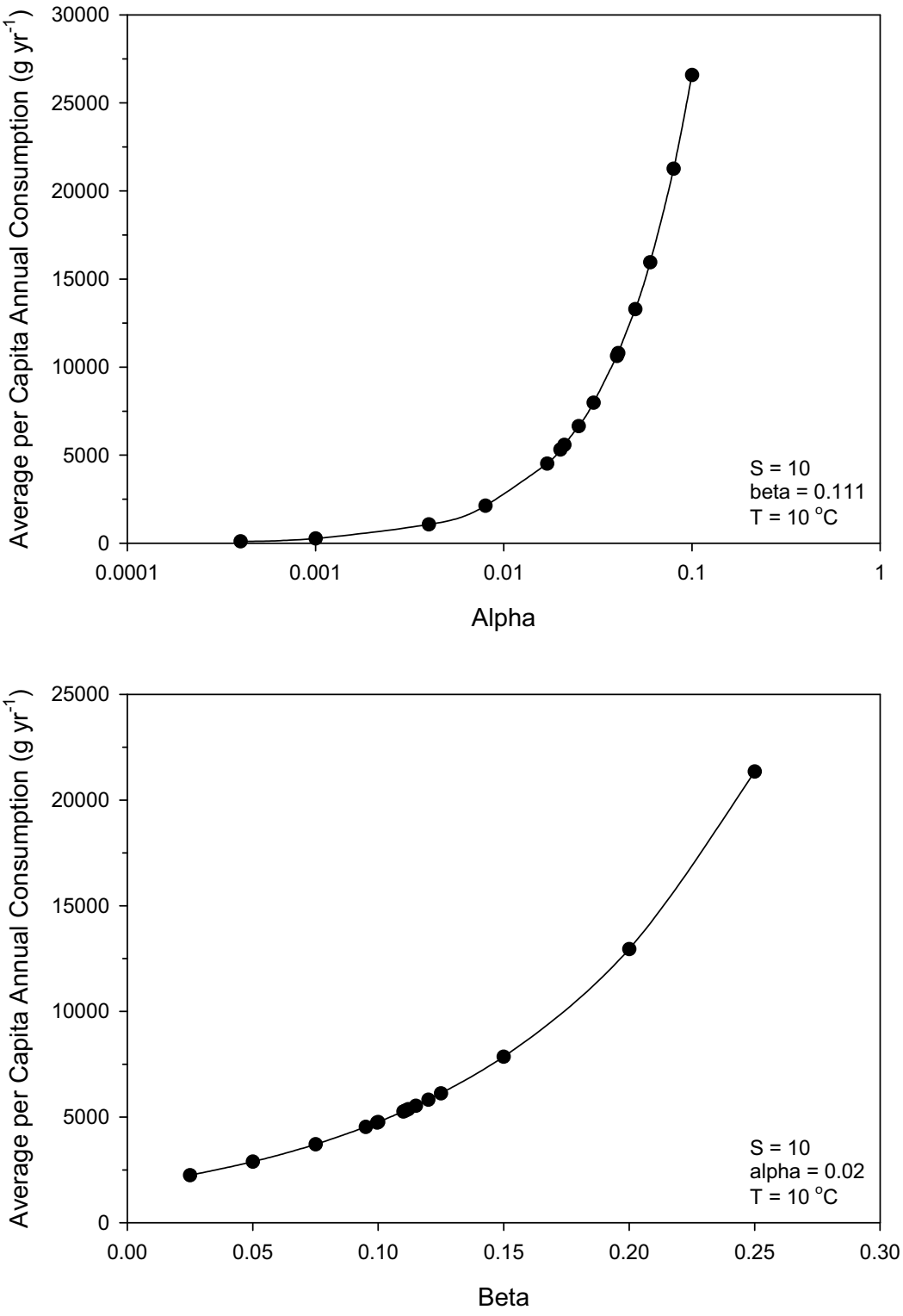


Figure B6.2. Sensitivity of Average per Capita Annual Consumption to the parameters a) alpha and b) beta.

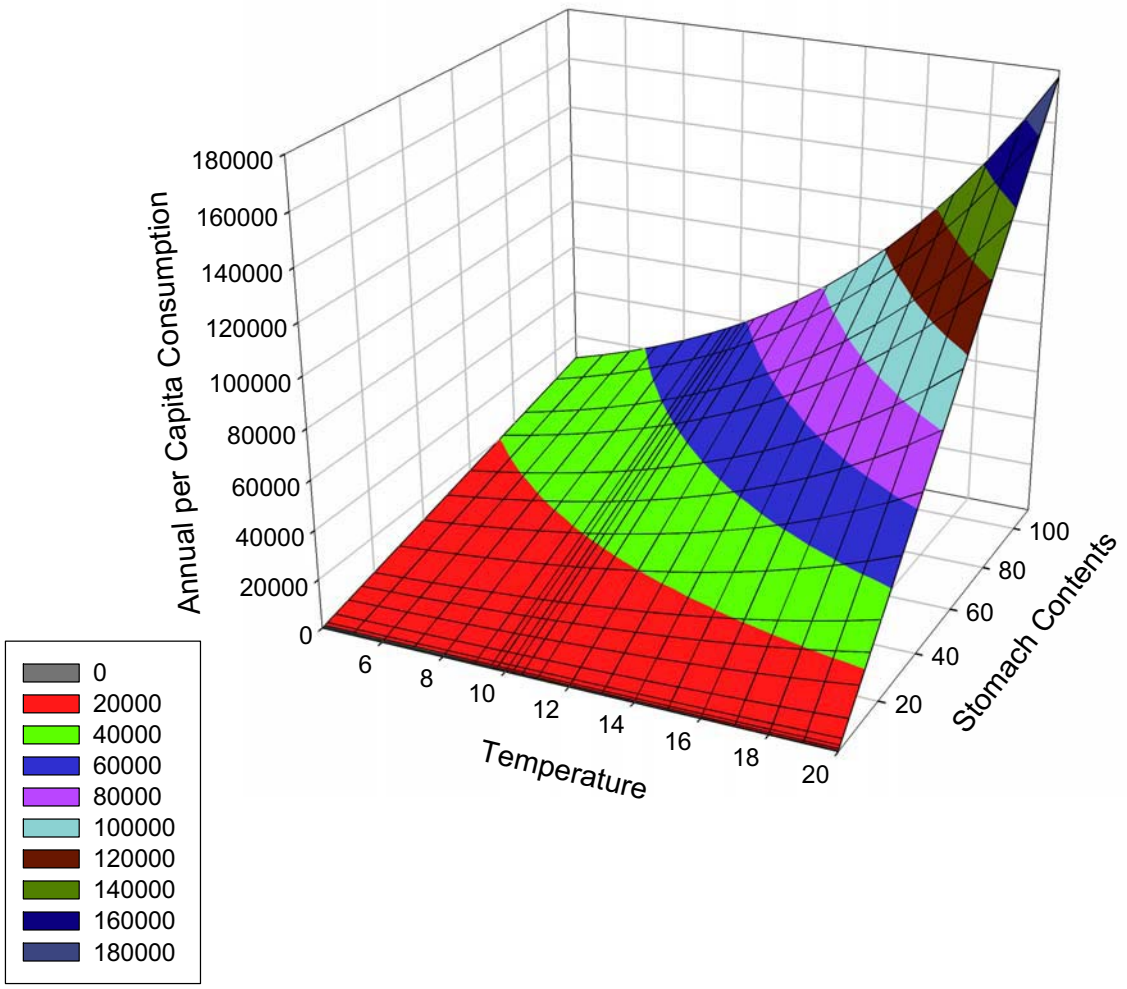


Figure 6.3. Sensitivity of Annual per Capita Consumption variation in both temperature and mean stomach contents.

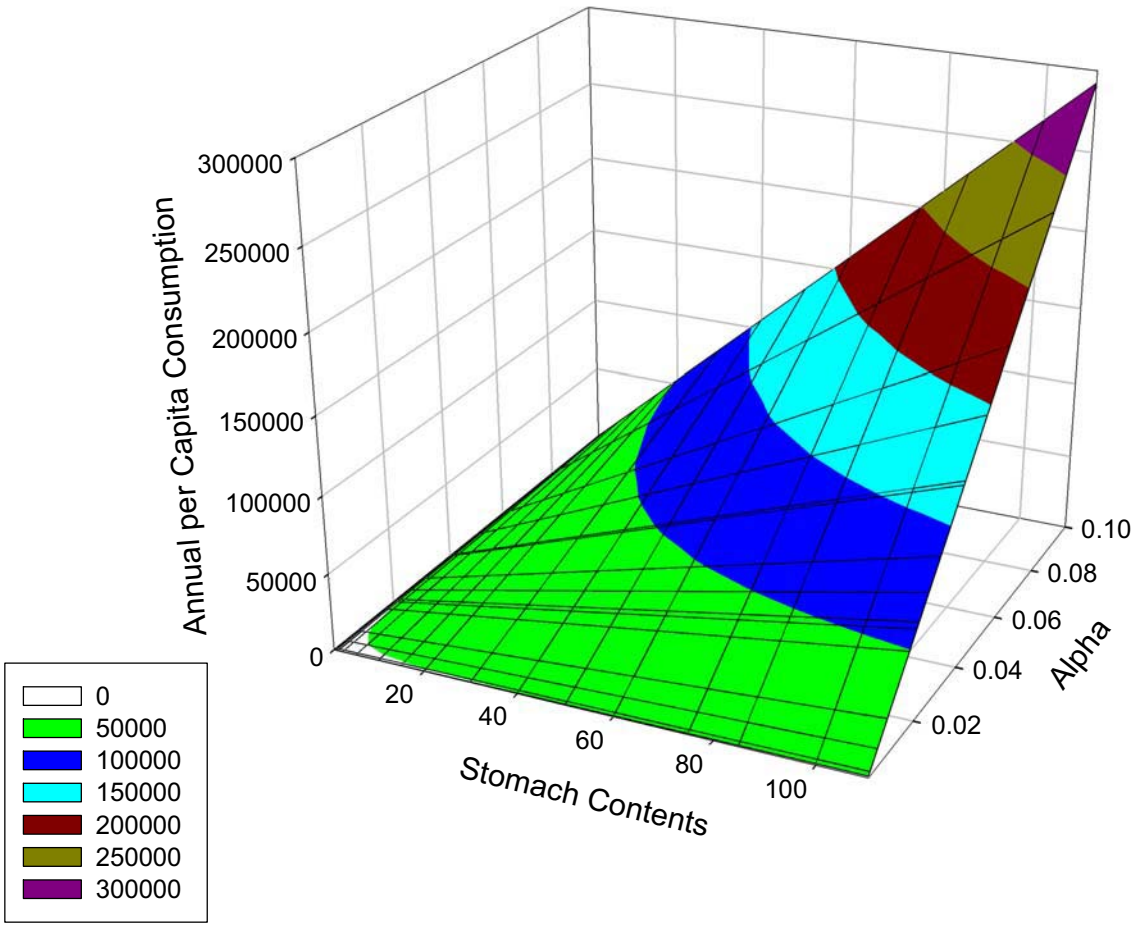


Figure 6.4. Sensitivity of Annual per Capita Consumption variation in both alpha and mean stomach contents.

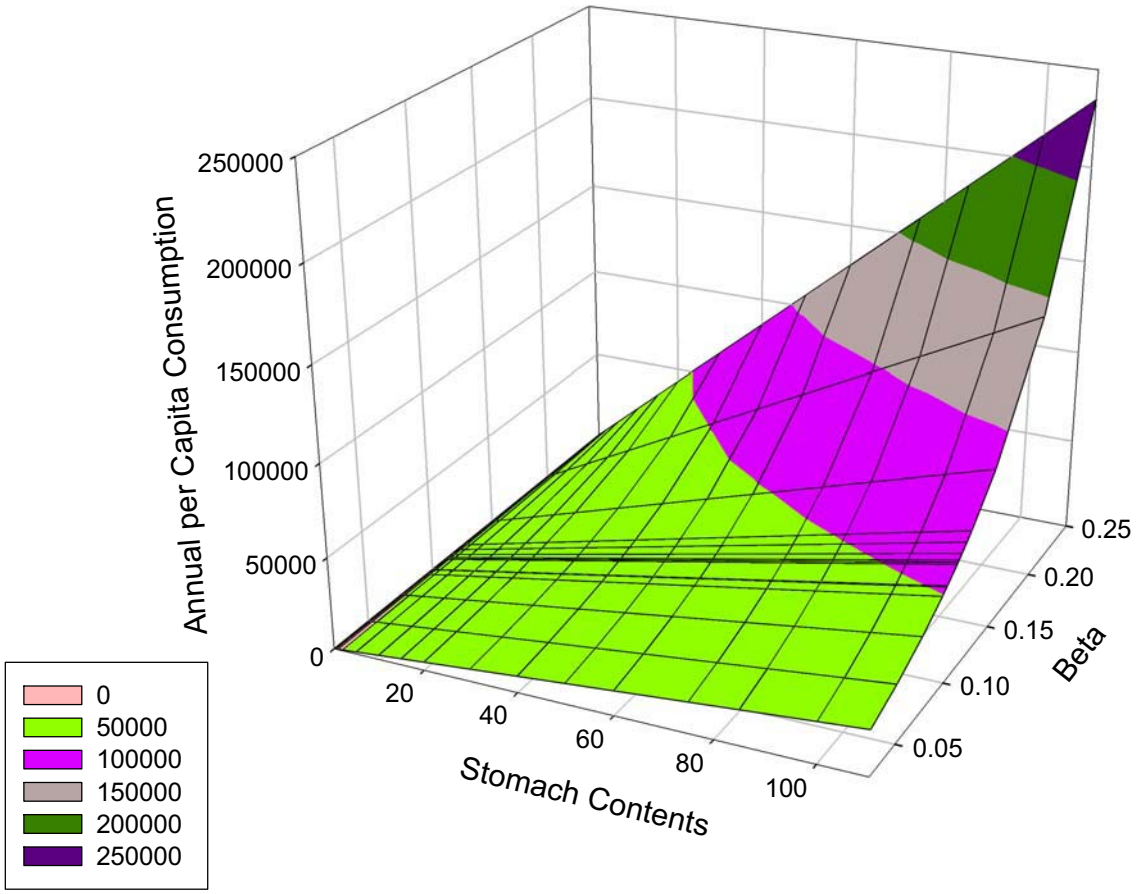


Figure 6.5. Sensitivity of Annual per Capita Consumption variation in both beta and mean stomach contents.

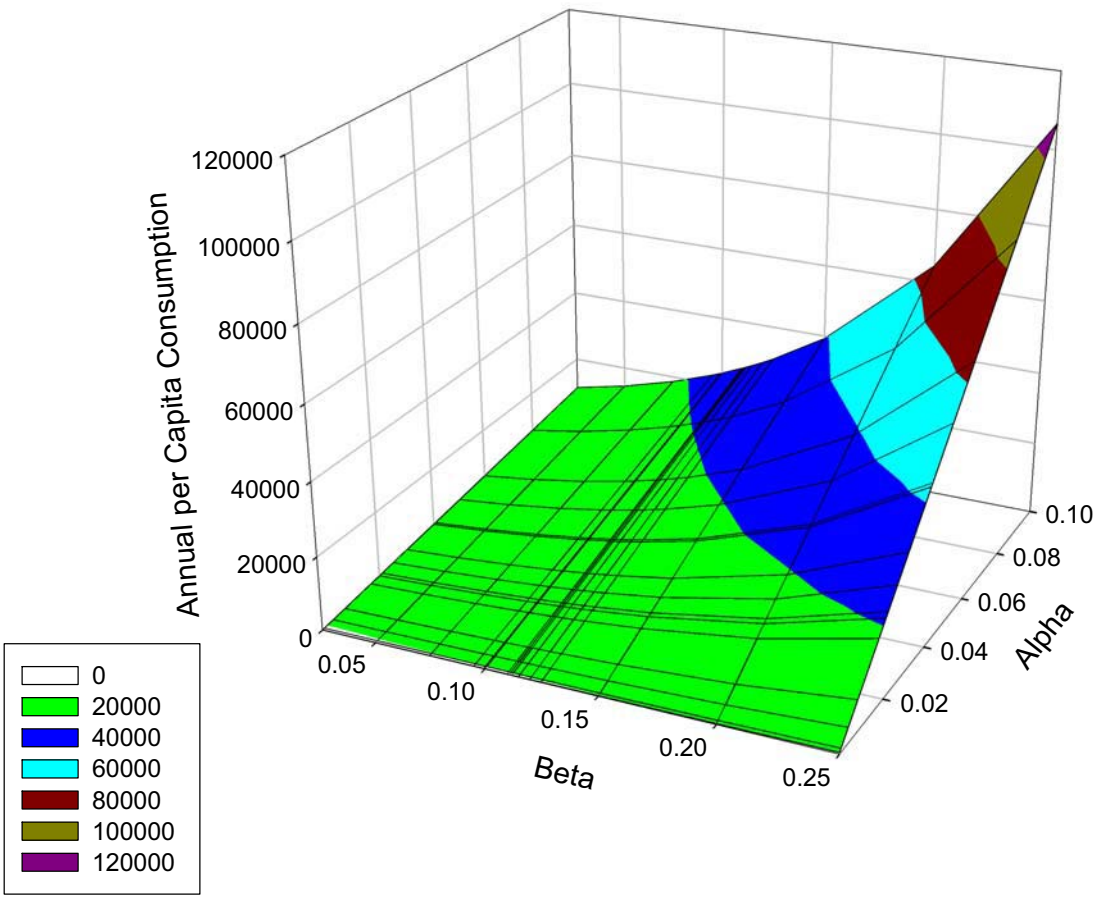


Figure 6.6. Sensitivity of Annual per Capita Consumption variation in both beta and alpha.

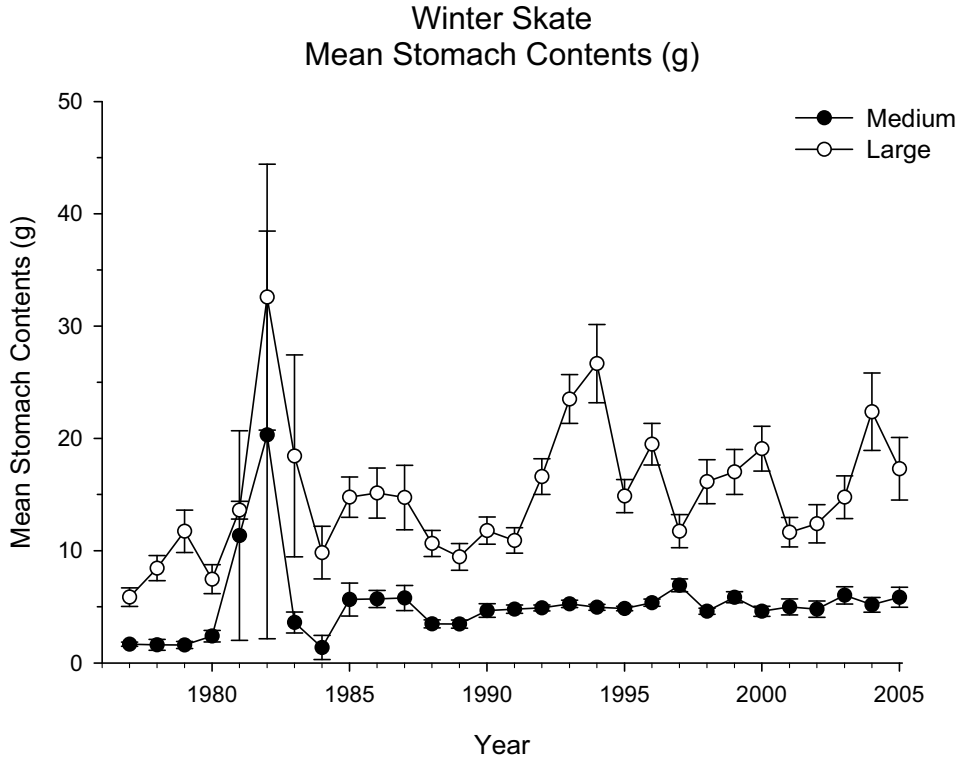


Figure B6.7a. The annual mean stomach contents (0.1 g) of winter skate for the strata set and time period noted. Each size class is noted. Error bars are ± 1 S.E.

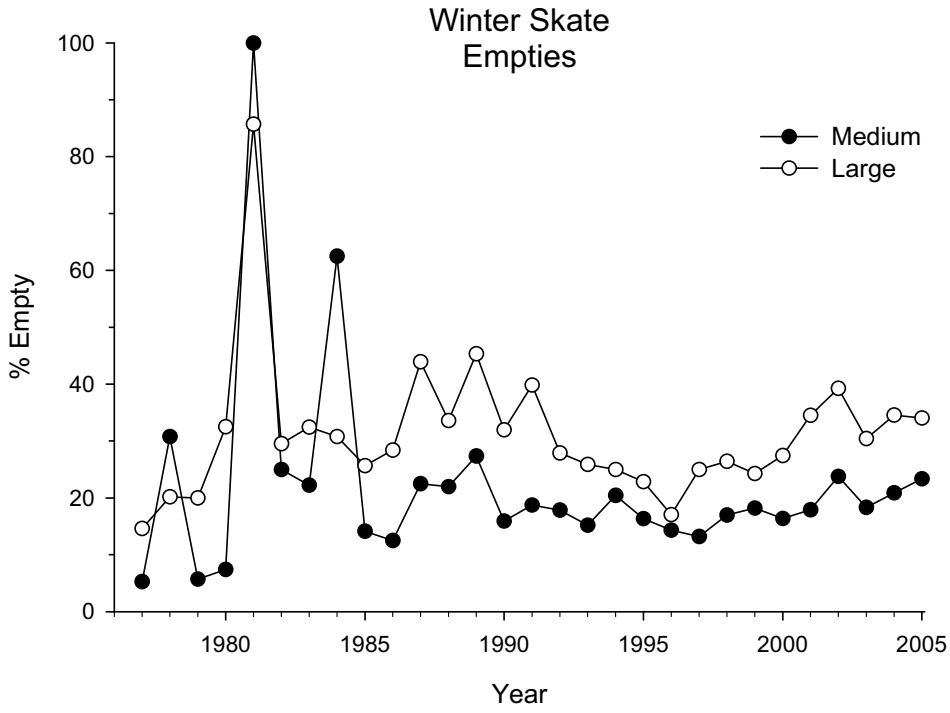


Figure B6.7b. The percentage of stomachs that were empty (i.e., containing no prey) of Winter skate for the strata set and time period noted. Each size class is noted

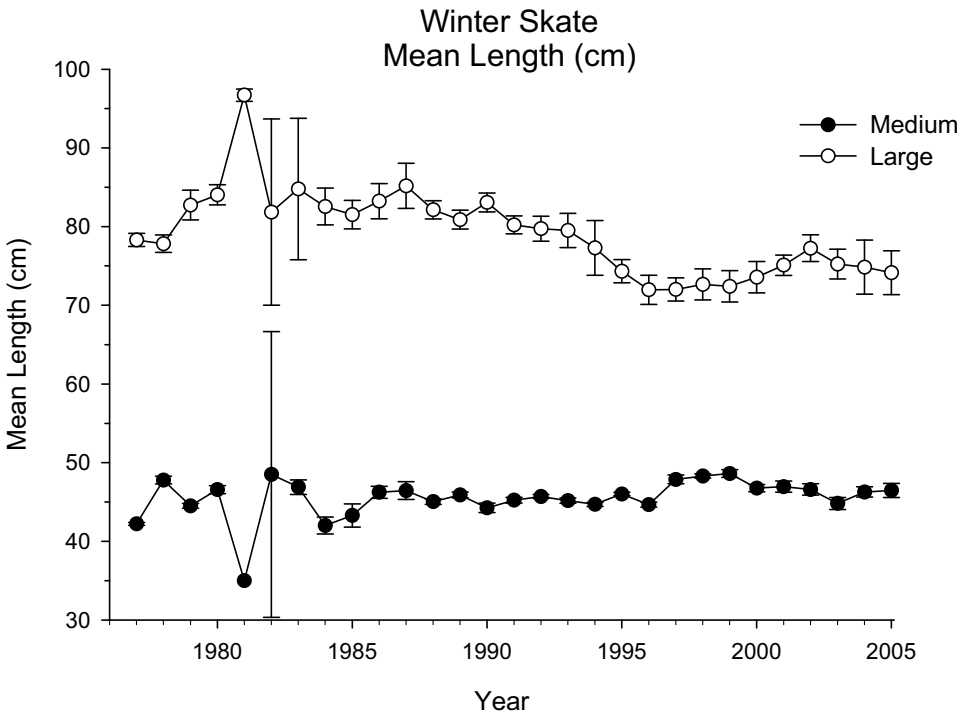


Figure B6.8a. The mean length (1 cm) of Winter skate from which stomach samples were collected, for the strata set and time period noted. Each size class is noted. Error bars are ± 1 S.E.

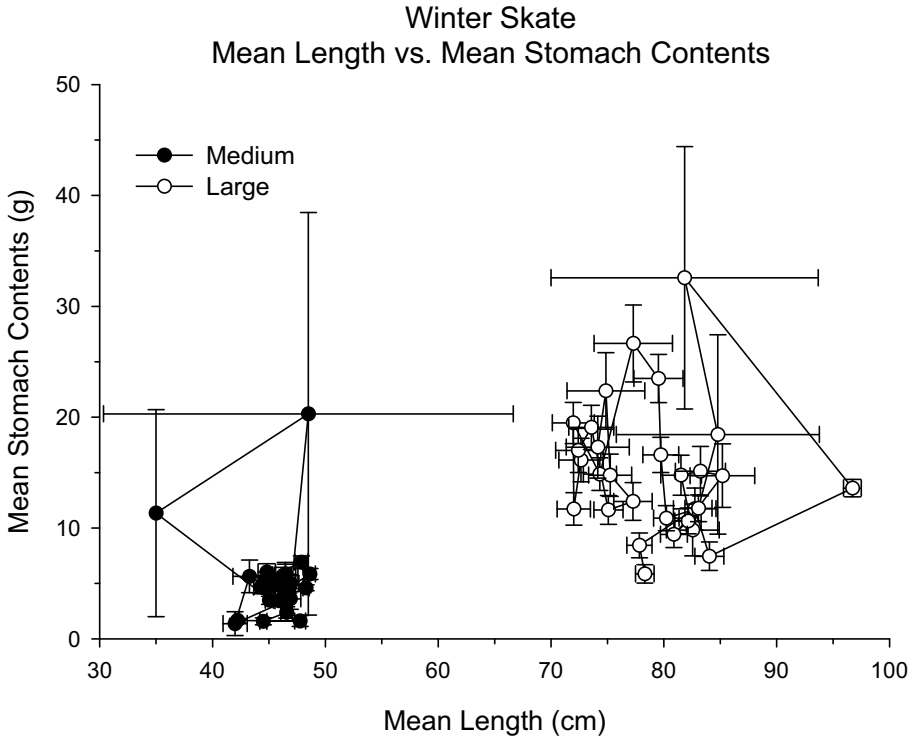


Figure B6.8b. The annual mean stomach contents (0.1 g) and the mean length (1 cm) of Winter skate for the strata set and time period noted. Each size class is noted. Error bars are ± 1 S.E.

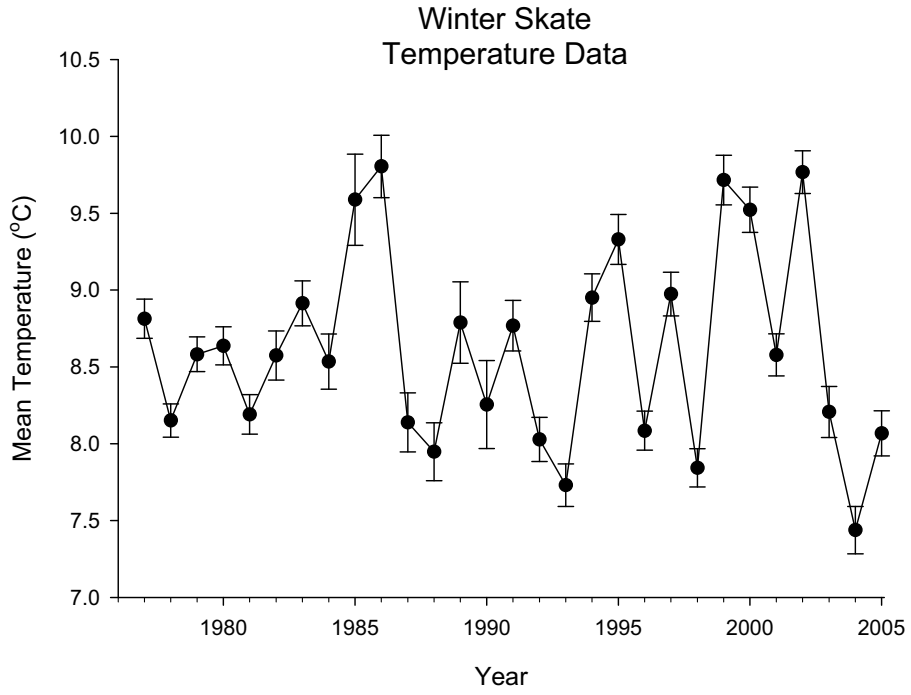


Figure B6.9a. The annual mean bottom temperature (0.1 °C) for the selected strata set, as taken from the bottom trawl survey over the time period noted. Error bars are ± 1 S.E.

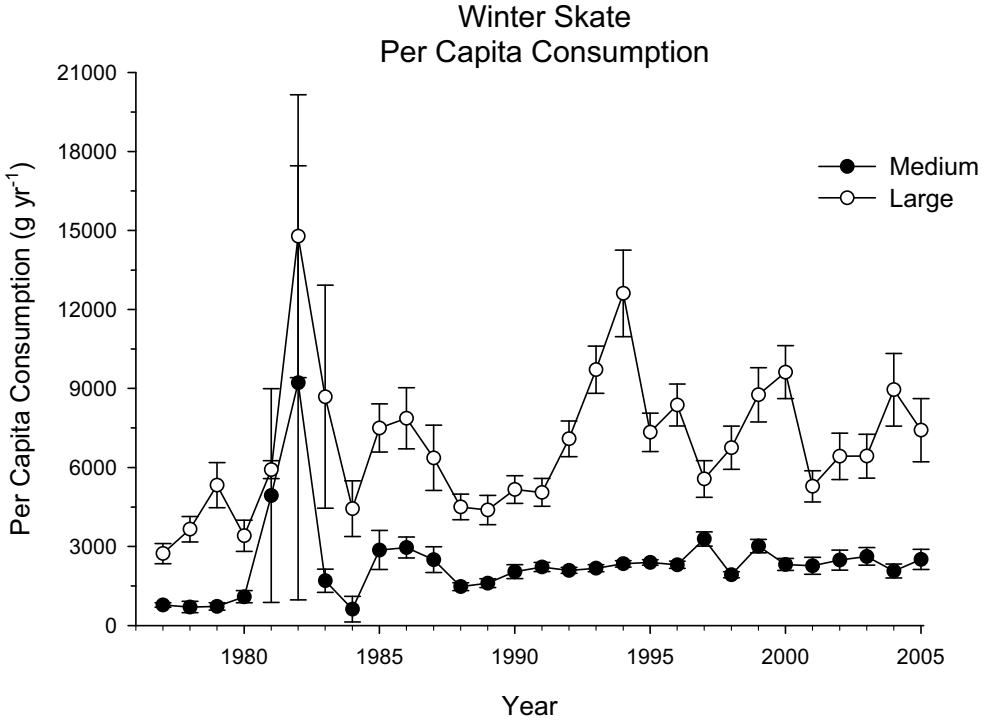


Figure B6.9b. The annual per capita consumption (g yr-1) of Winter skate for the strata set and time period noted. Each size class is noted. Error bars are ± 1 S.E.

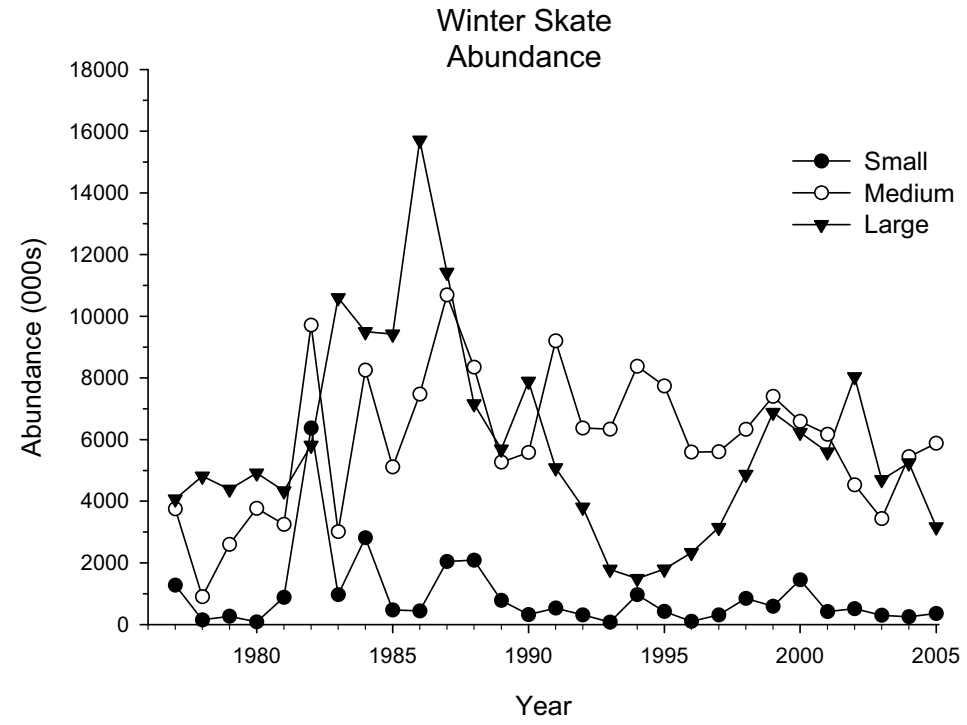


Figure B6.10a. The annual mean swept area abundance of winter skate for the strata set and time period noted. Each size class is noted.

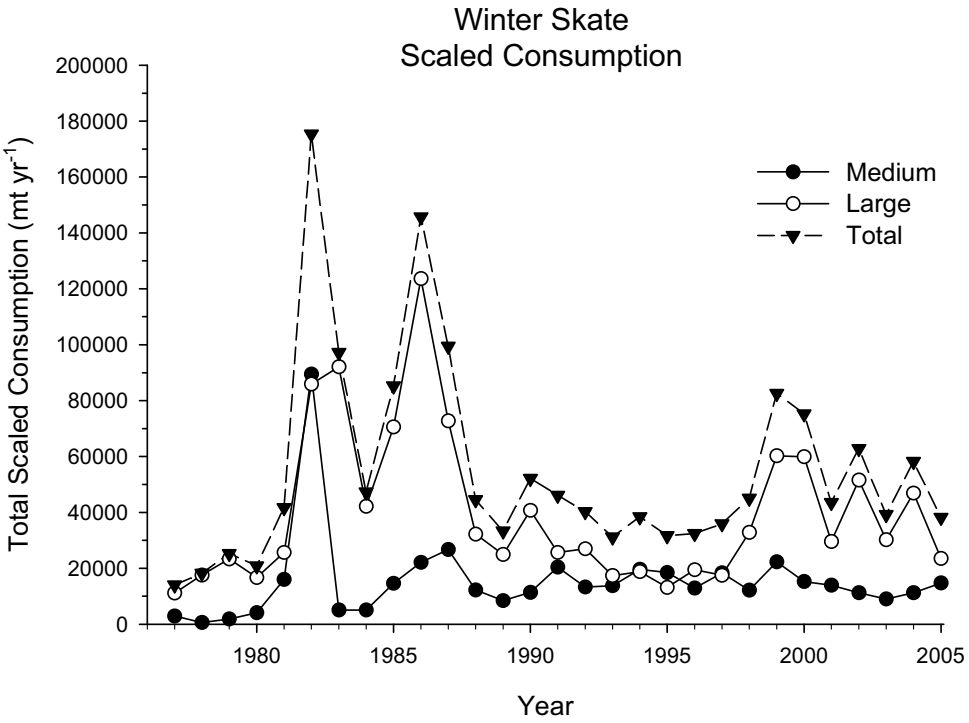


Figure B6.10b. The annual total consumption (MT yr-1) of Winter skate for the strata set and time period noted.

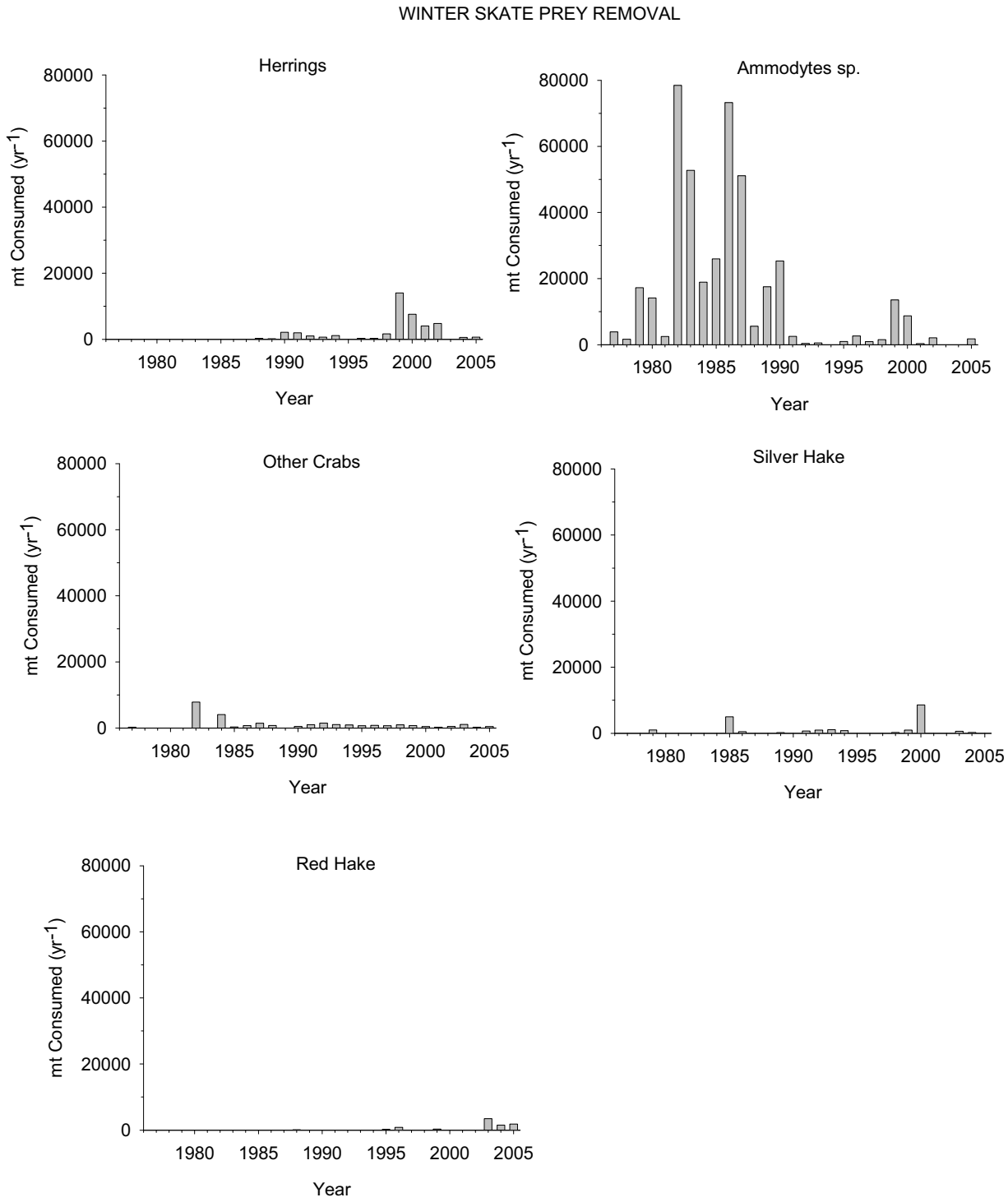


Figure B6.11. The amount of prey consumed (MT yr^{-1}) by Winter skate for the strata set and time period noted. These estimates represent the combination of total annual total consumption and the diet compositions of Winter skate. These prey were selected as some of the major prey (>>5 % of diet composition) of Winter skate.

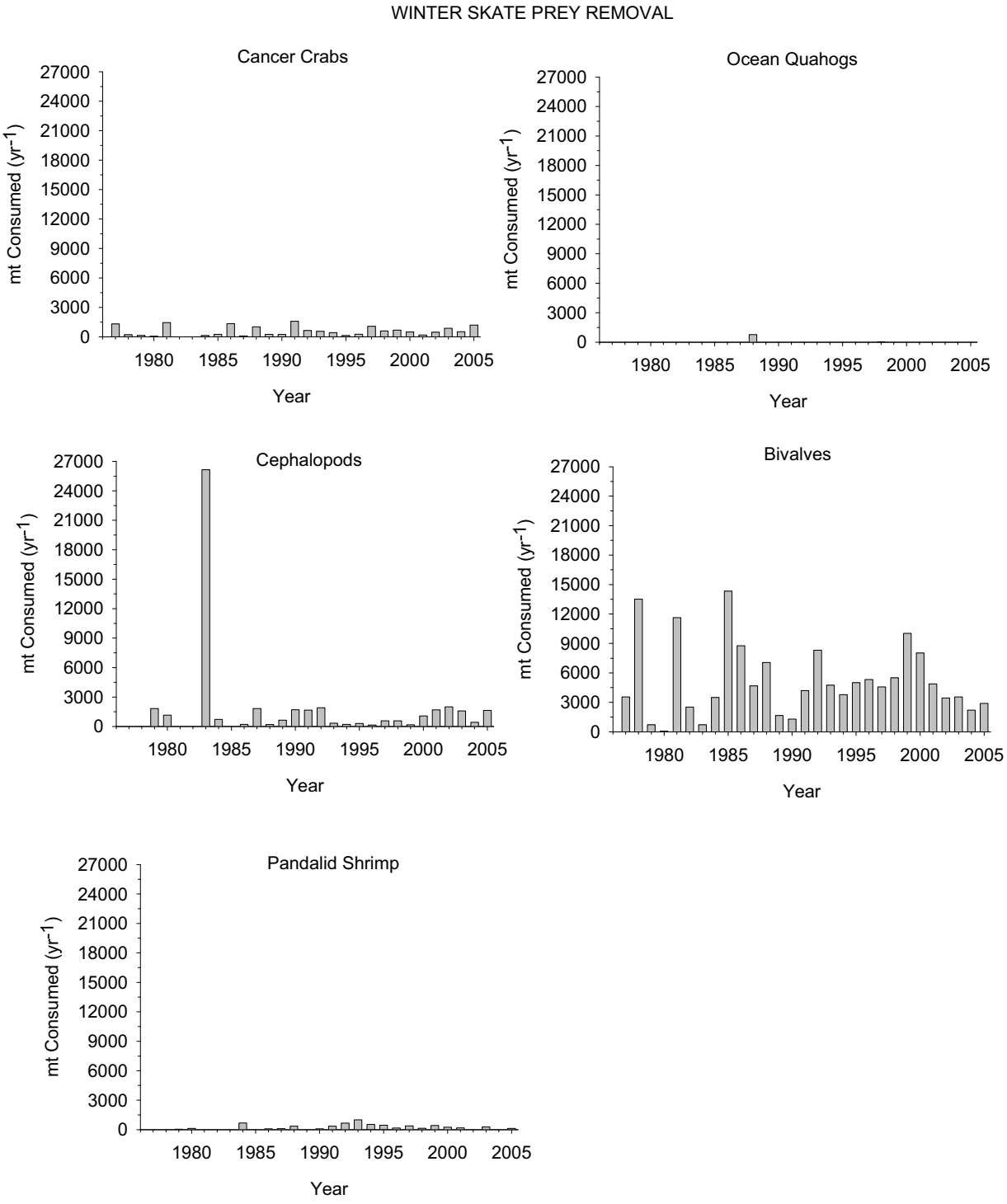


Figure B6.12. The amount of prey consumed (MT yr^{-1}) by Winter skate for the strata set and time period noted. These estimates represent the combination of total annual total consumption and the diet compositions of Winter skate. These prey were selected as some of the major prey (>>5 % of diet composition) of Winter skate.

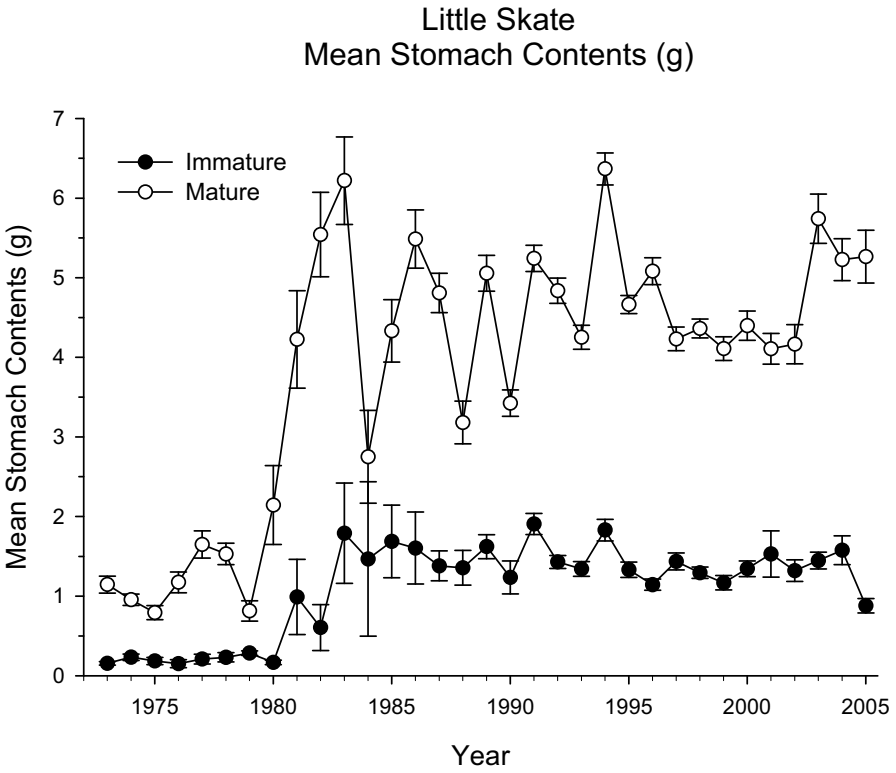


Figure B6.13a. The annual mean stomach contents (0.1 g) of Little skate for the strata set and time period noted. Each size class is noted. Error bars are ± 1 S.E.

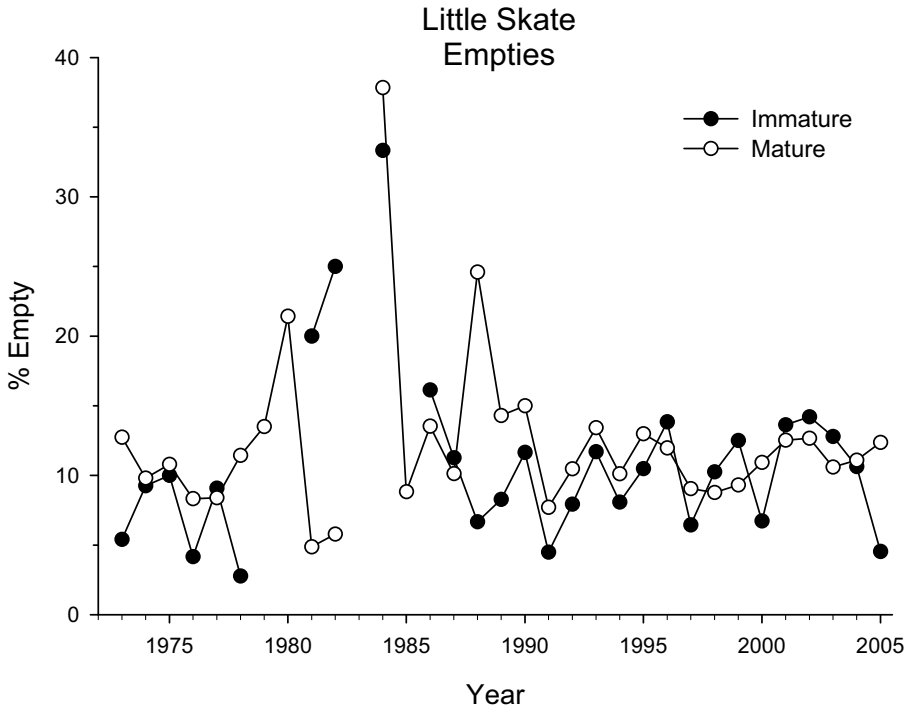


Figure B6.13b. The percentage of stomachs that were empty (i.e., containing no prey) of Little skate for the strata set and time period noted. Each size class is noted.

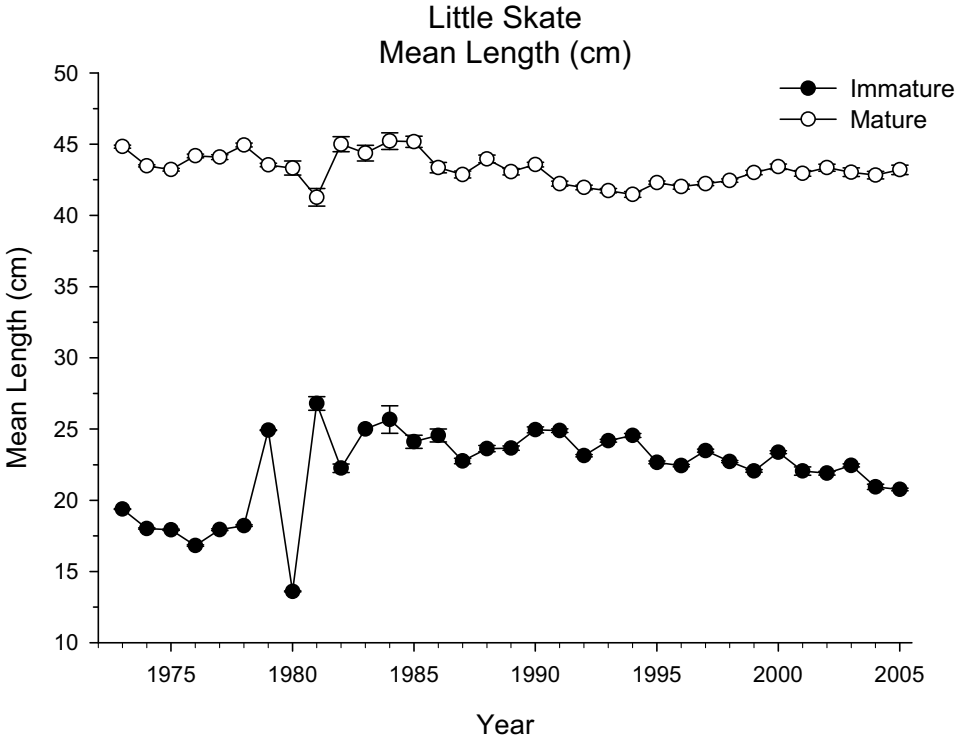


Figure B6.14a. The mean length (1 cm) of Little skate from which stomach samples were collected, for the strata set and time period noted. Each size class is noted. Error bars are ± 1 S.E.

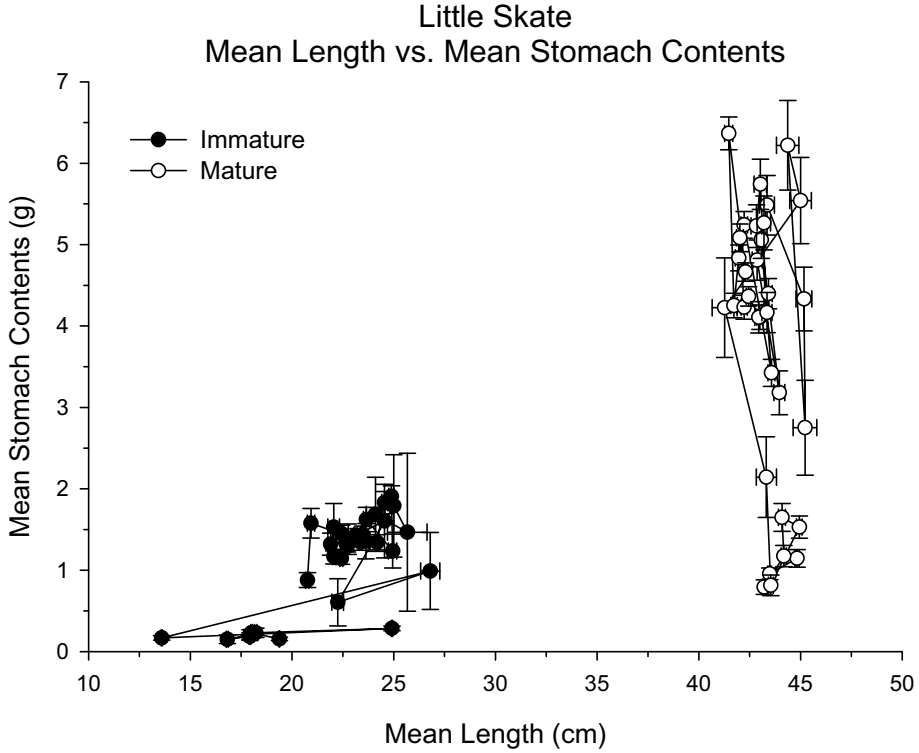


Figure B6.14b. The annual mean stomach contents (0.1 g) and the mean length (1 cm) of Little skate for the strata set and time period noted. Each size class is noted. Error bars are ± 1 S.E.

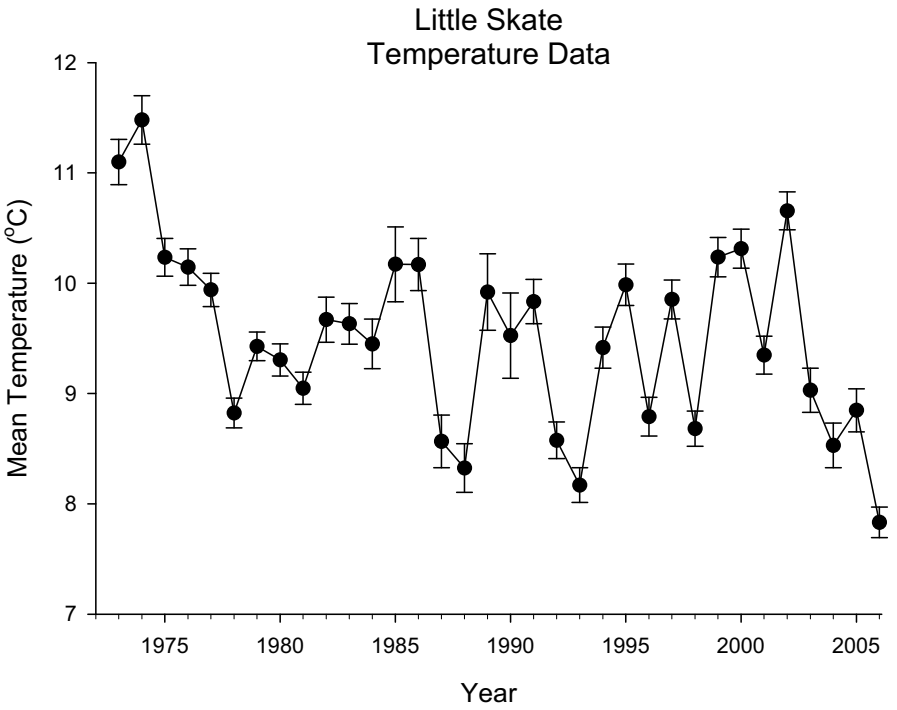


Figure B6.15a. The annual mean bottom temperature (0.1 oC) for the selected strata set, as taken from the bottom trawl survey over the time period noted. Error bars are ± 1 S.E.

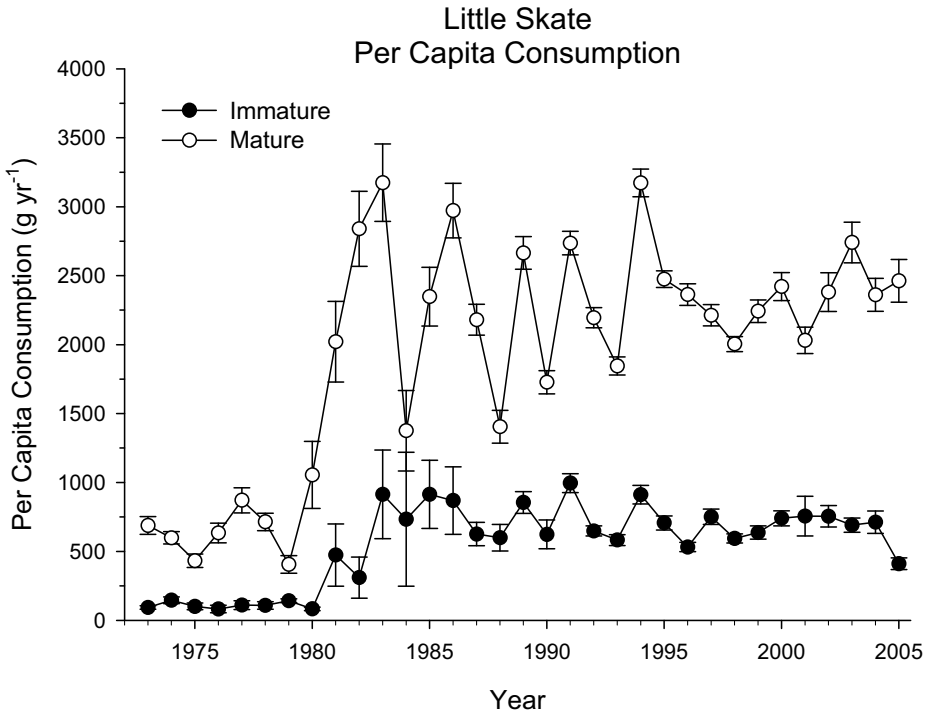


Figure B6.15b. The annual per capita consumption (g yr^{-1}) of Little skate for the strata set and time period noted. Each size class is noted. Error bars are ± 1 S.E.

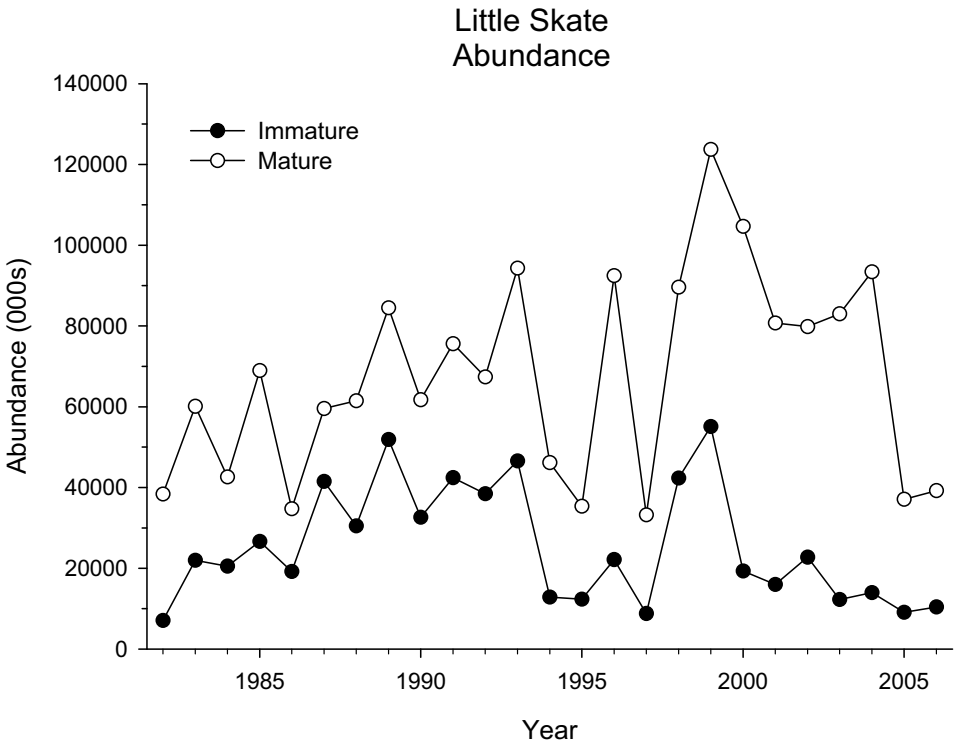


Figure B6.16a. The annual mean swept area abundance of Little skate for the strata set and time period noted. Each size class is noted.

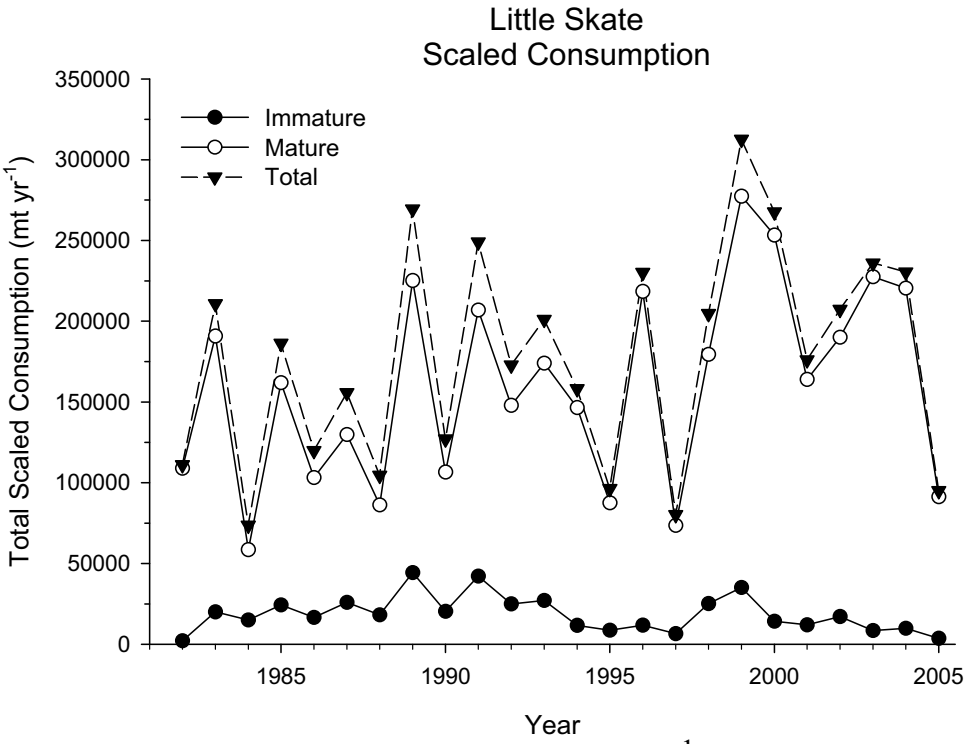


Figure B6.16b. The annual total consumption (MT yr^{-1}) of Little skate for the strata set and time period noted.

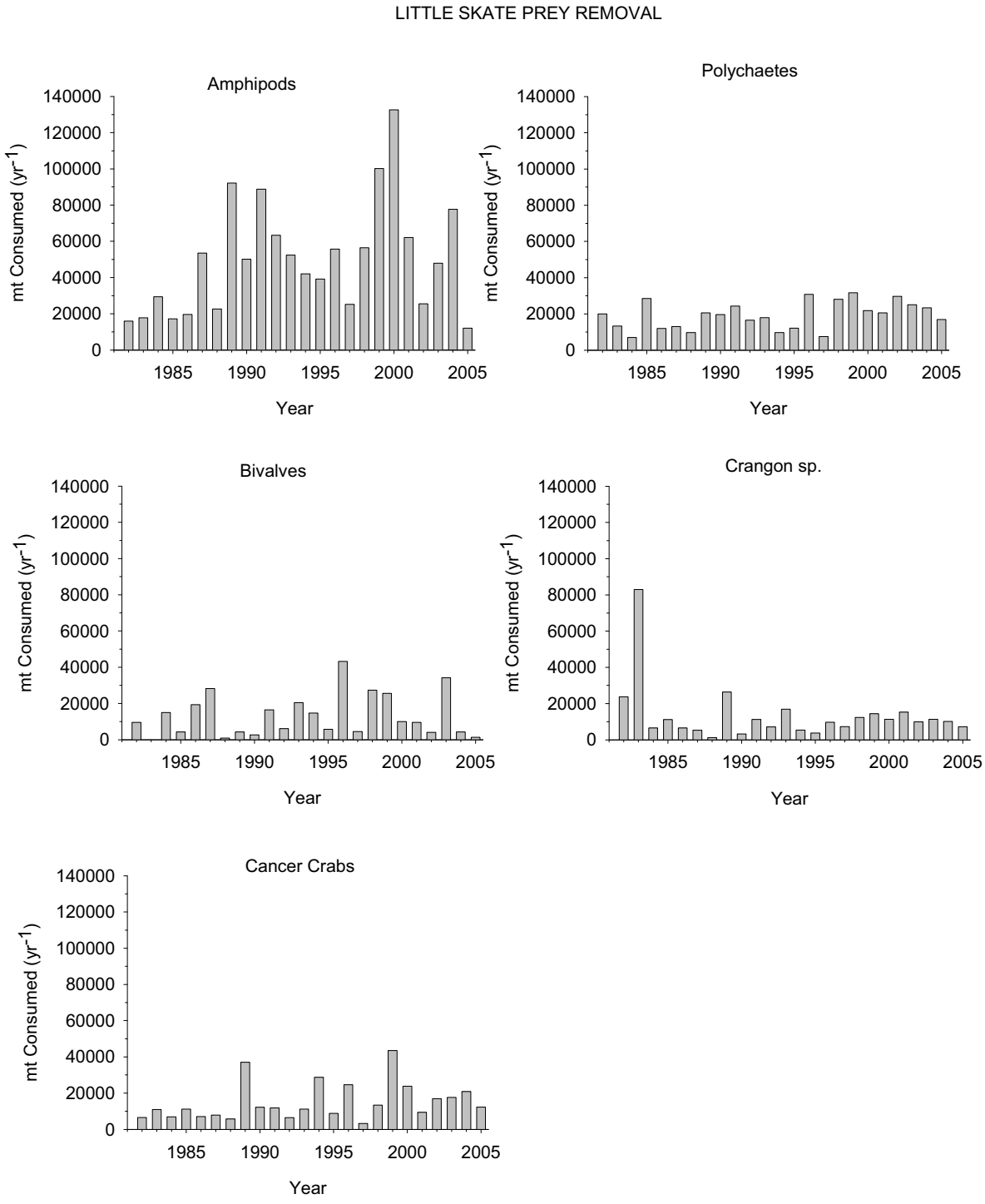


Figure B6.17. The amount of prey consumed (MT yr-1) by Little skate for the strata set and time period noted. These estimates represent the combination of total annual total consumption and the diet compositions of Little skate. These prey were selected as some of the major prey (>>5 % of diet composition) of Little skate.

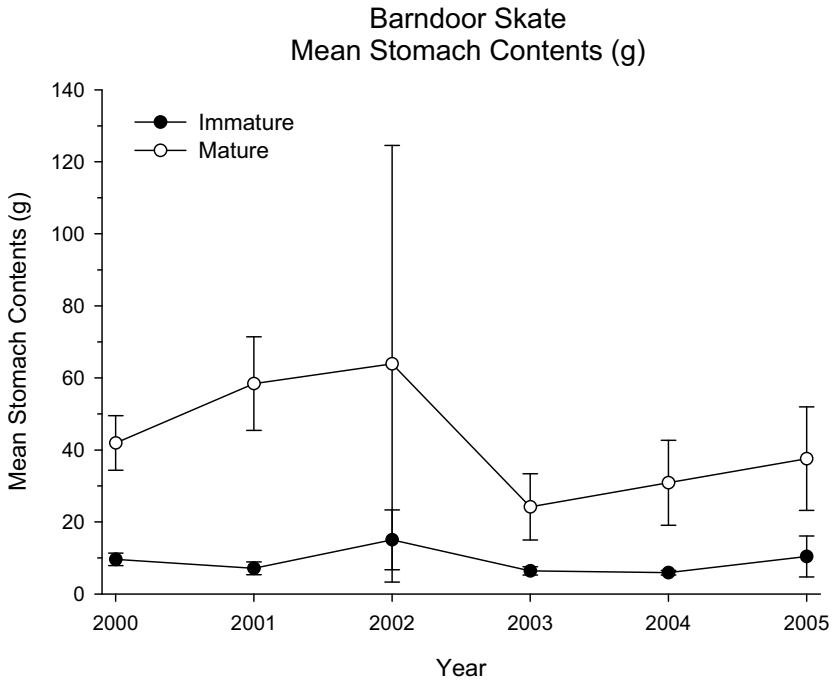


Figure B6.18a. The annual mean stomach contents (0.1 g) of barndoor skate for the strata set and time period noted. Each size class is noted. Error bars are ± 1 S.E.

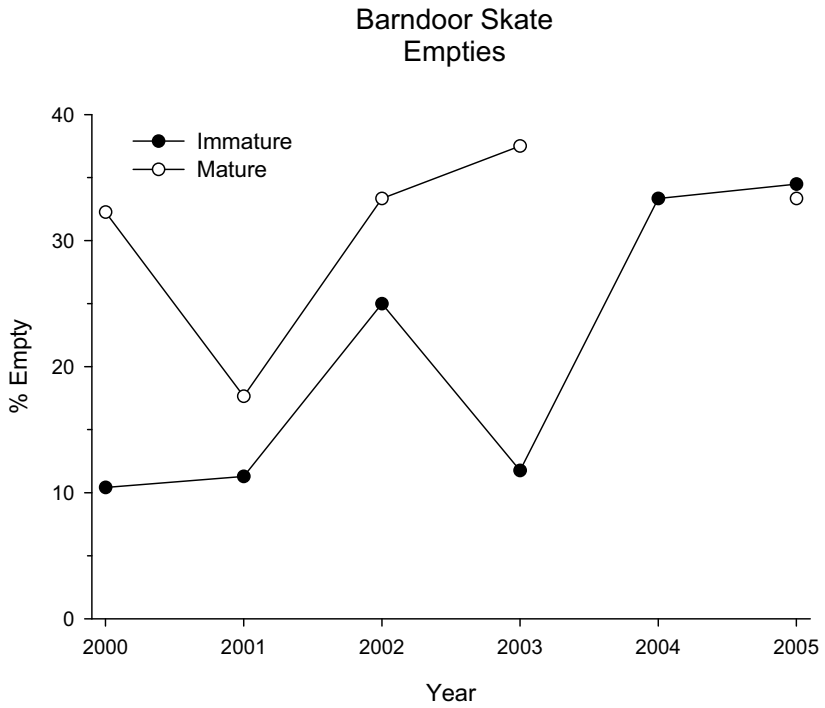


Figure B6.18b. The percent of barndoor skates that had empty stomachs, by year and size class.

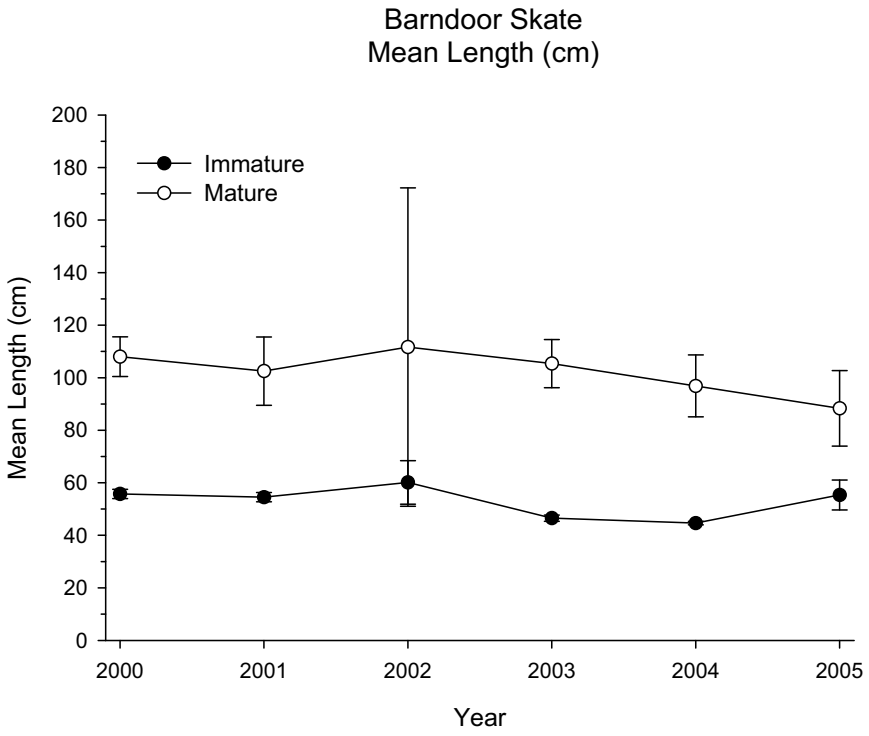


Figure B6.19a. The mean length (1 cm) of Barndoor skate from which stomach samples were collected, for the strata set and time period noted. Each size class is noted. Error bars are ± 1 S.E.

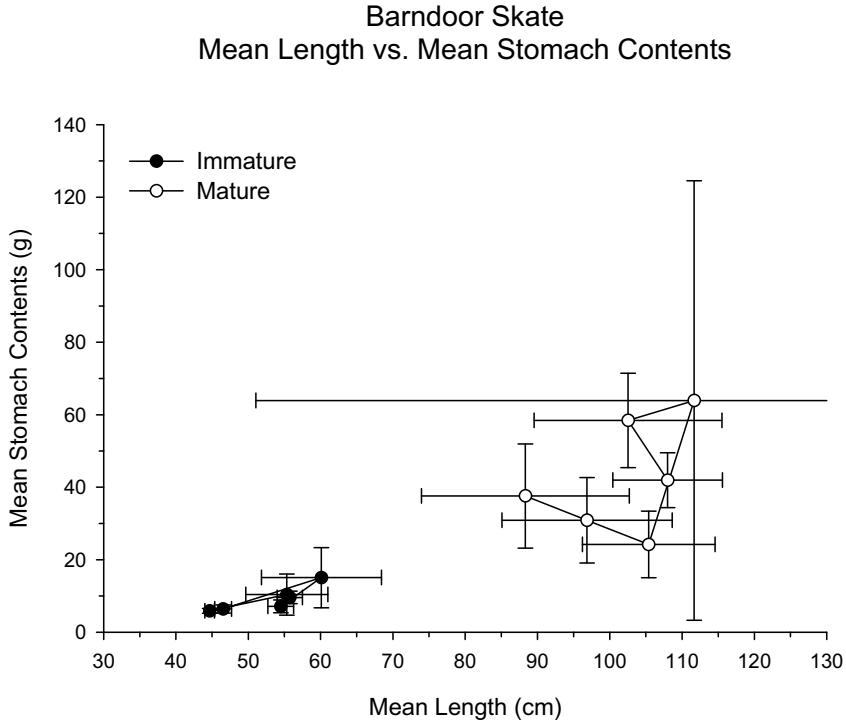


Figure B6.19b. The annual mean stomach contents (0.1 g) and the mean length (1 cm) of Barndoor skate for the strata set and time period noted. Each size class is noted. Error bars are ± 1 S.E.

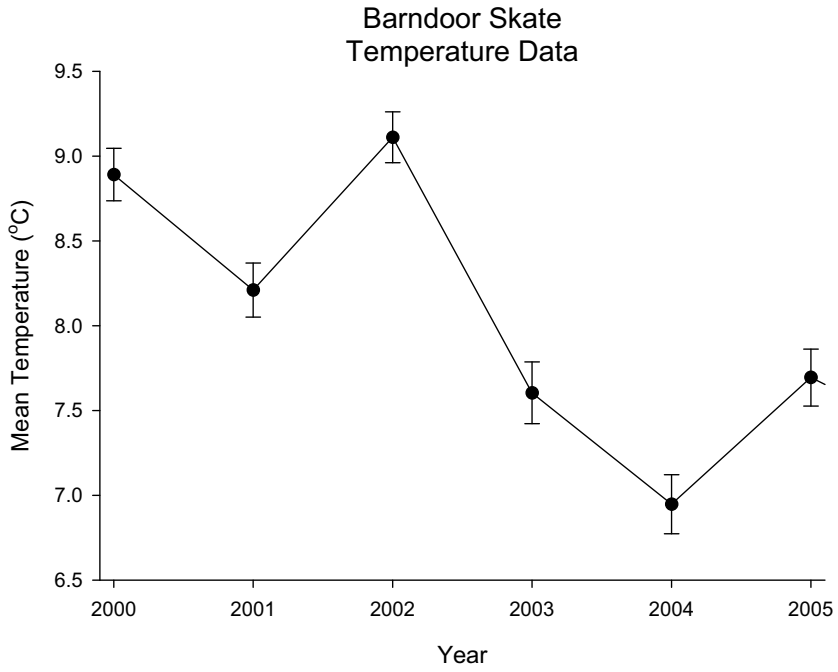


Figure B6.20a. The annual mean bottom temperature (0.1 ^{o}C) for the selected strata set, as taken from the bottom trawl survey over the time period noted. Error bars are ± 1 S.E.

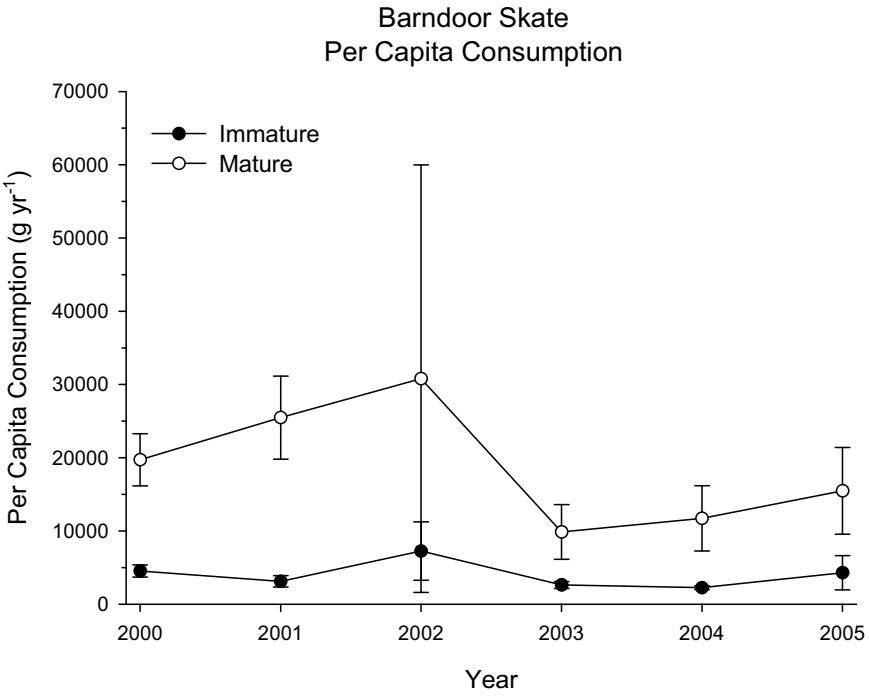


Figure B6.20b. The annual per capita consumption (g yr^{-1}) of Barndoor skate for the strata set and time period noted. Each size class is noted.

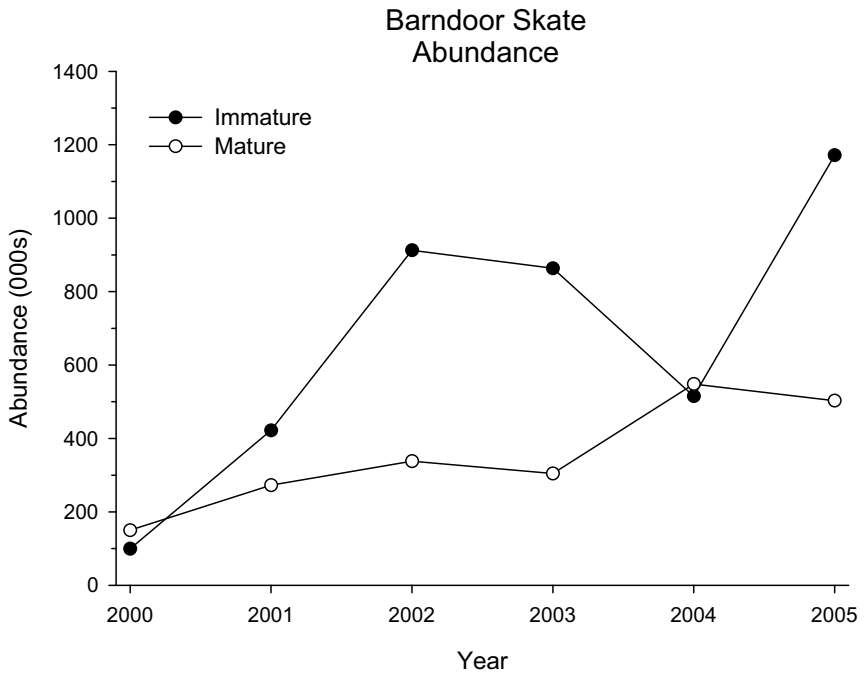


Figure B6.21a. The annual mean swept area abundance of Barndoor skate for the strata set and time period noted. Each size class is noted.

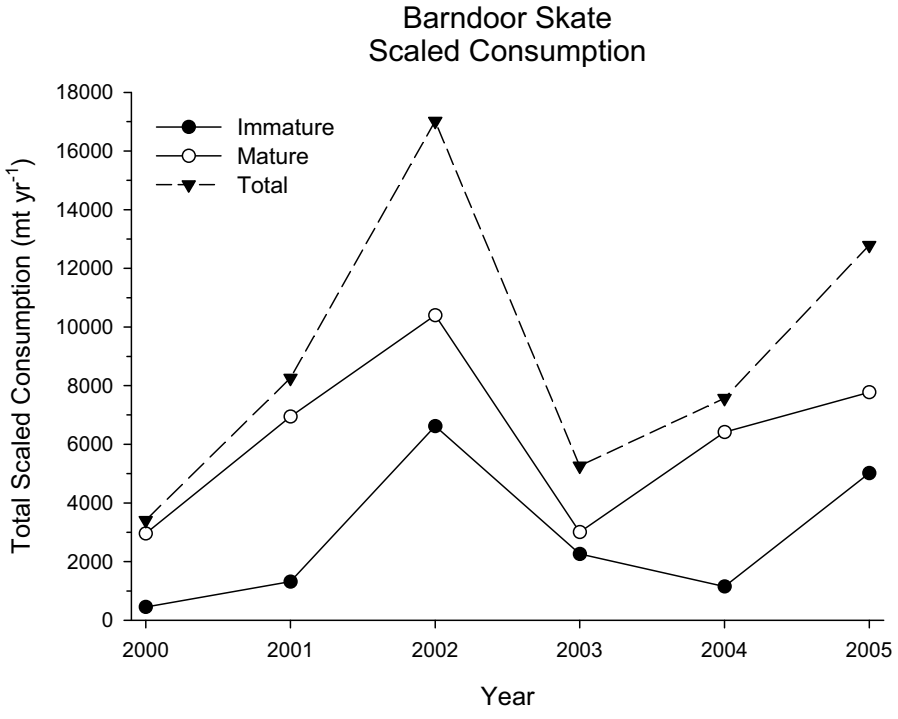


Figure B6.21b. The annual total consumption (MT yr^{-1}) of Barndoor skate for the strata set and time period noted.

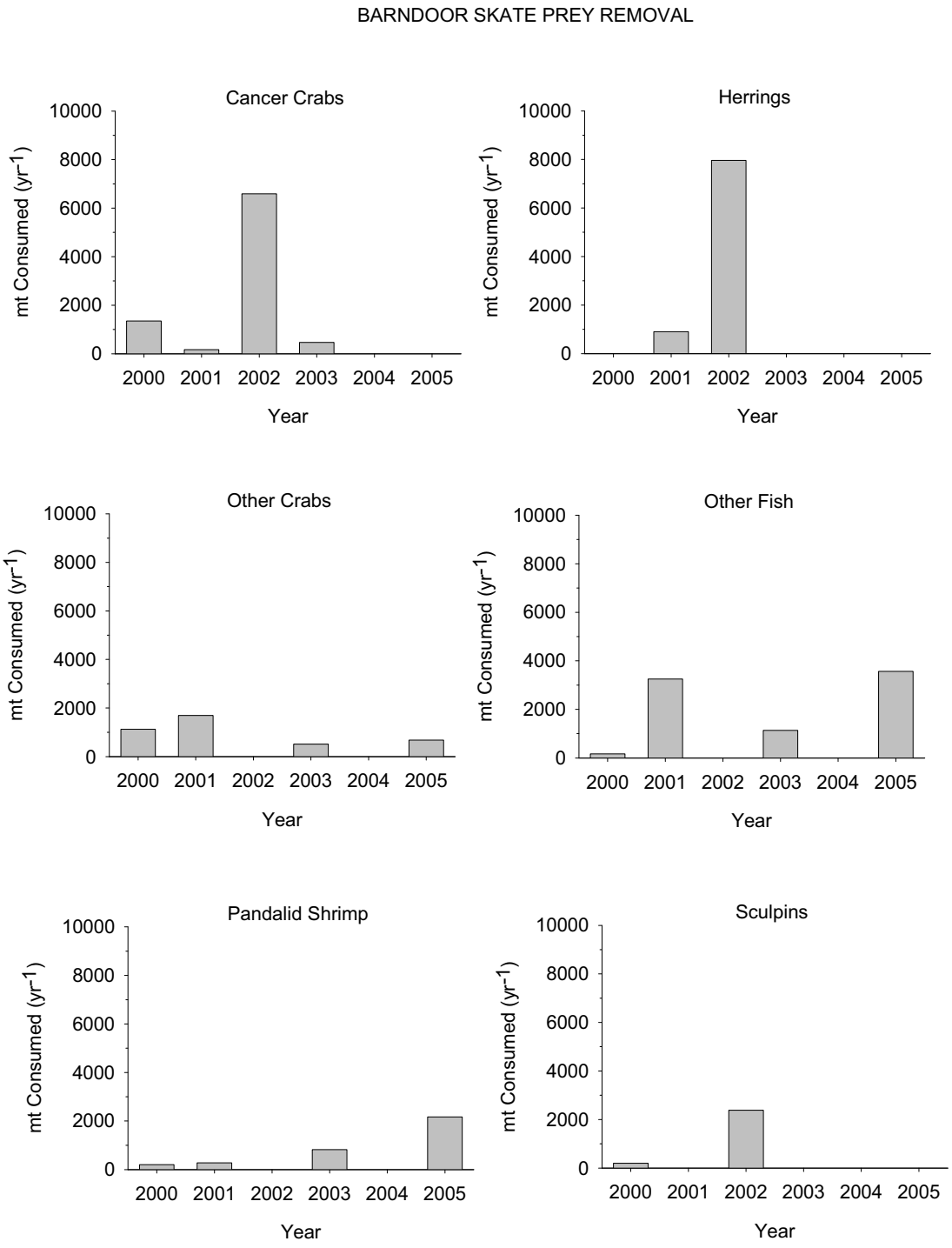


Figure B6.22. The amount of prey consumed (MT yr^{-1}) by Barndoor skate for the strata set and time period noted. These estimates represent the combination of total annual total consumption and the diet compositions of Barndoor skate. These prey were selected as some of the major prey (>>5 % of diet composition) of Barndoor skate.

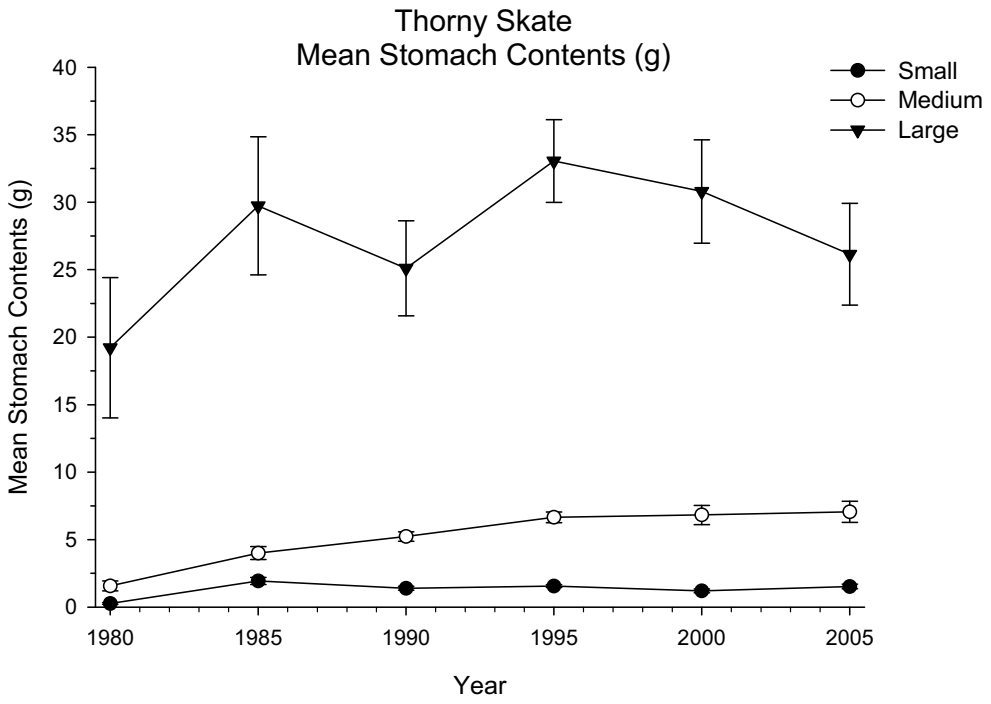


Figure B6.23a. The annual mean stomach contents (0.1 g) of Thorny skate for the strata set and time period noted. Each size class is noted. Error bars are ± 1 S.E.

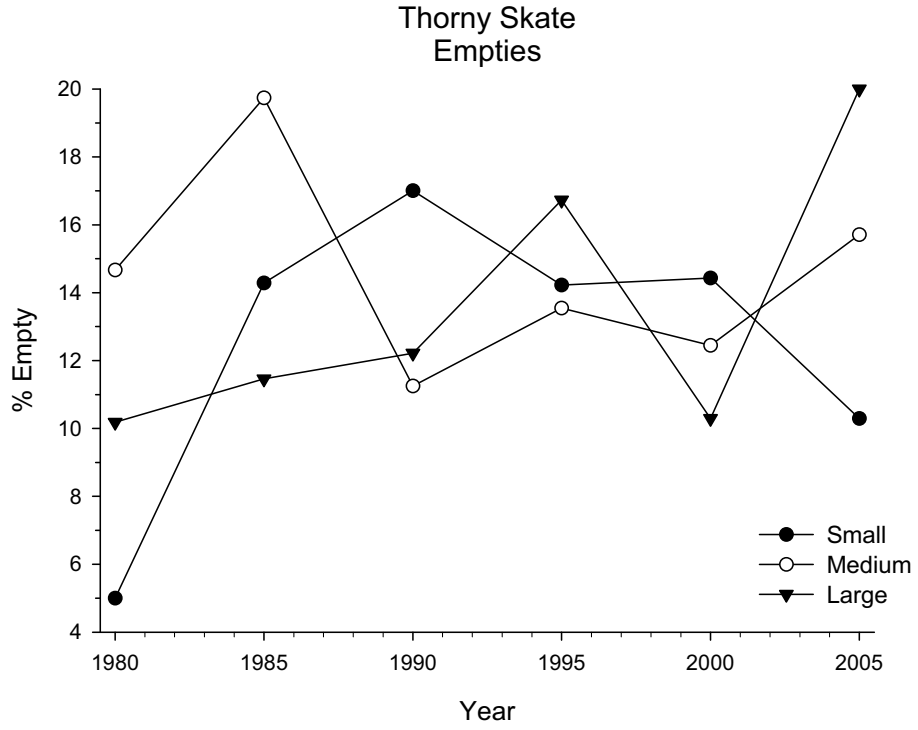


Figure B6.23b. The percentage of stomachs that were empty (i.e., containing no prey) of Thorny skate for the strata set and time period noted. Each size class is noted

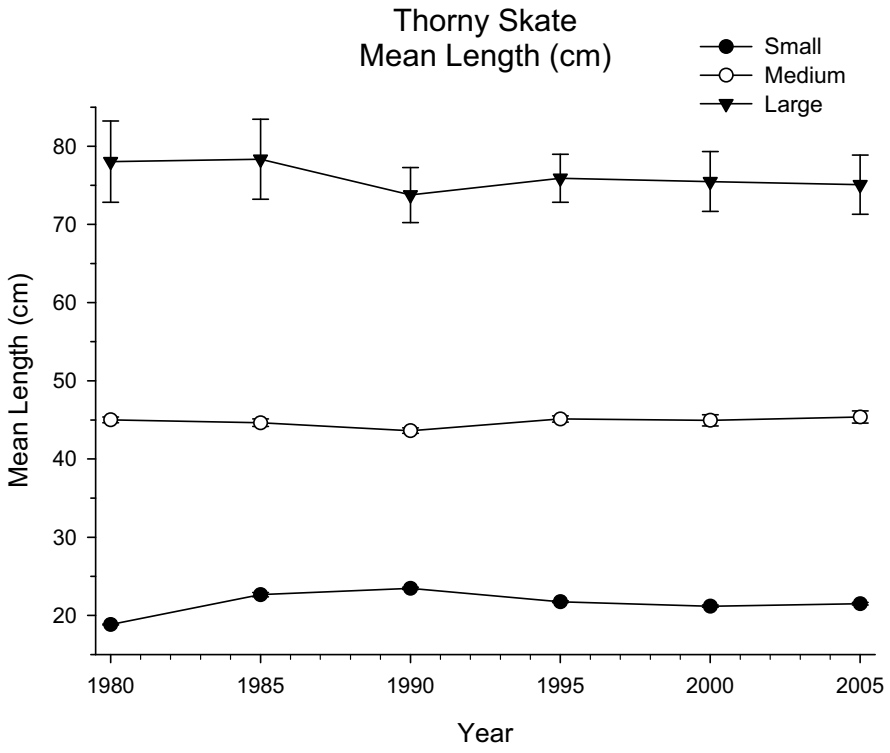


Figure B6.24a. The mean length (1 cm) of Thorny skate from which stomach samples were collected, for the strata set and time period noted. Each size class is noted. Error bars are ± 1 S.E.

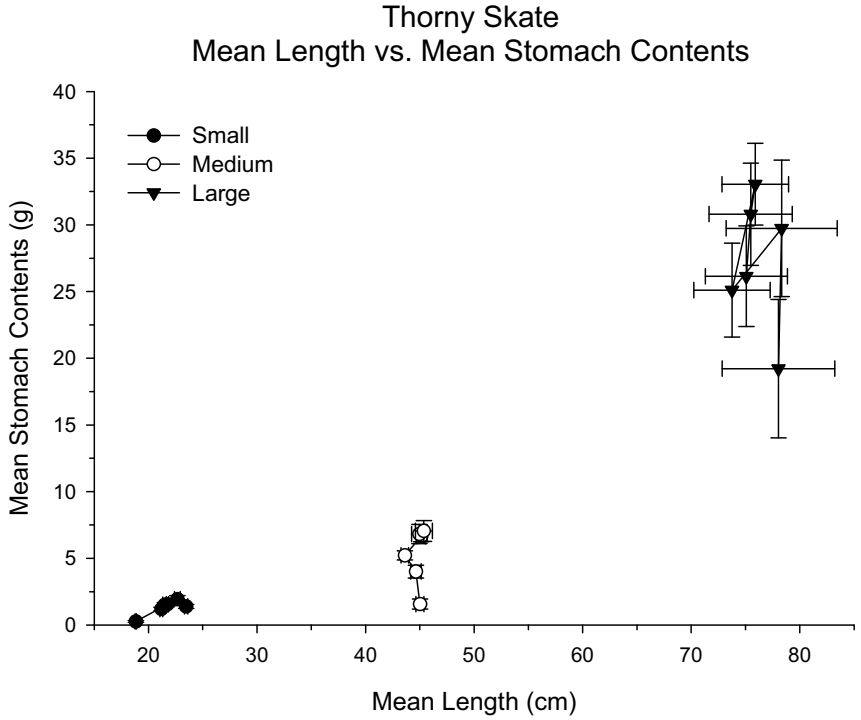


Figure B6.24b. The annual mean stomach contents (0.1 g) and the mean length (1 cm) of Thorny skate for the strata set and time period noted. Each size class is noted. Error bars are ± 1 S.E.

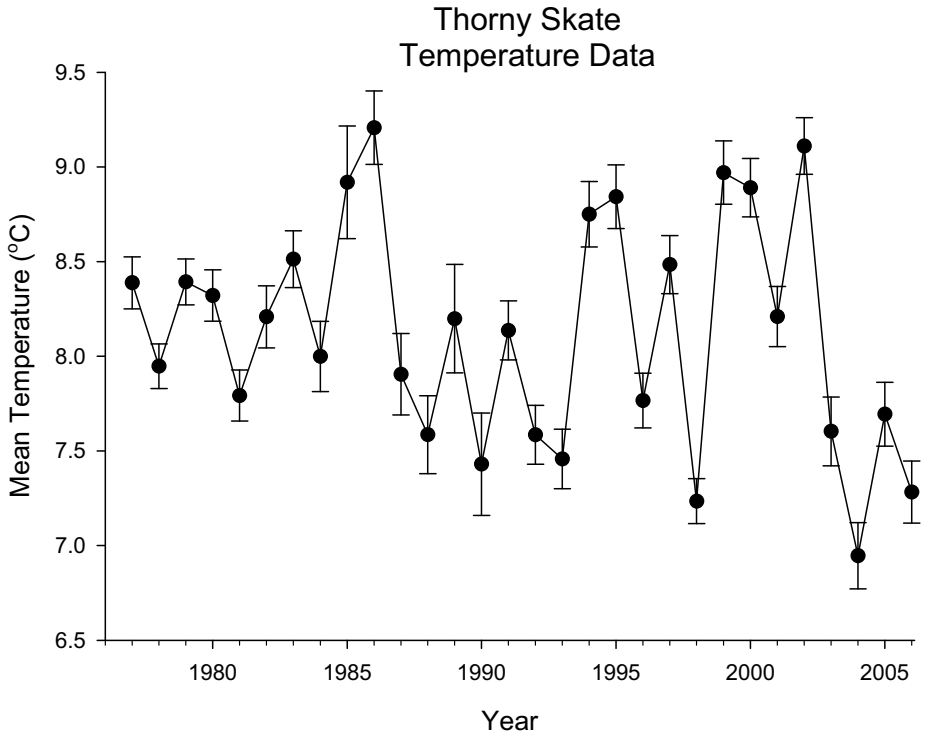


Figure B6.25a. The annual mean bottom temperature (0.1 ^{o}C) for the selected strata set, as taken from the bottom trawl survey over the time period noted. Error bars are ± 1 S.E.

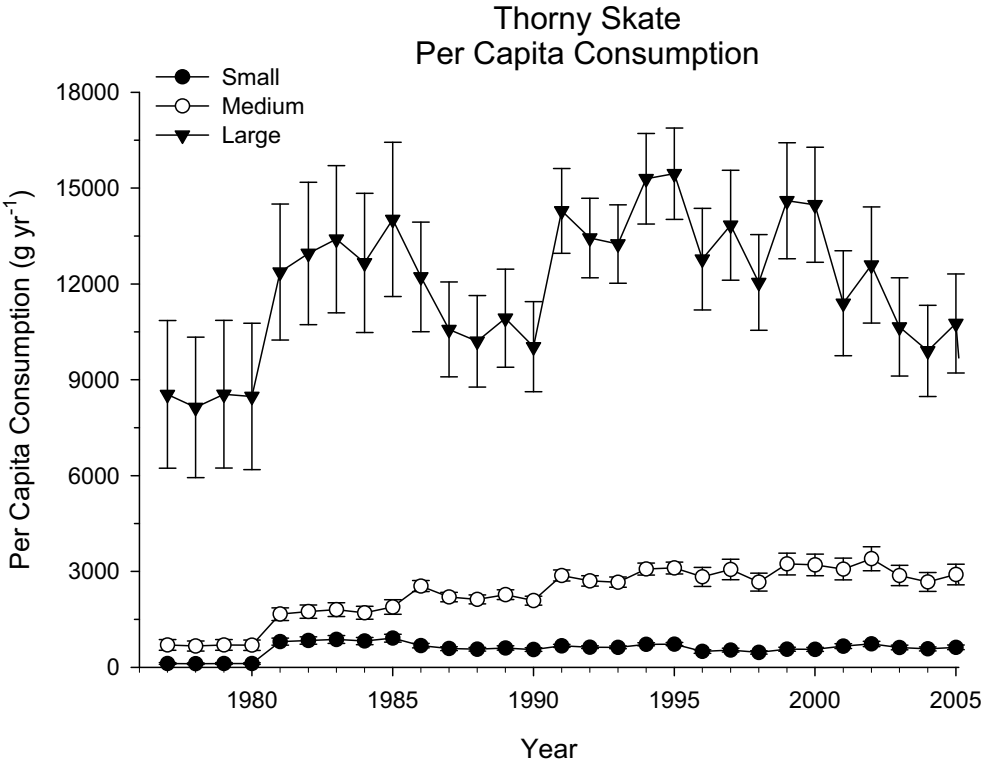


Figure B6.25b. The annual per capita consumption (g yr^{-1}) of Thorny skate for the strata set and time period noted. Each size class is noted. Error bars are ± 1 S.E.

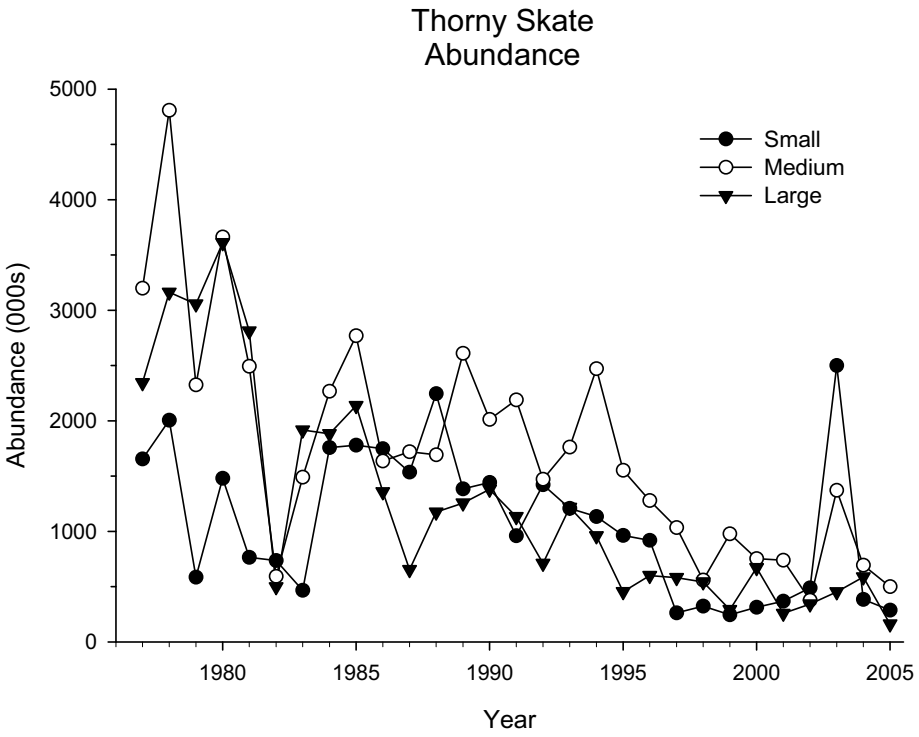


Figure B6.26a. The annual mean swept area abundance of Thorny skate for the strata set and time period noted. Each size class is noted.

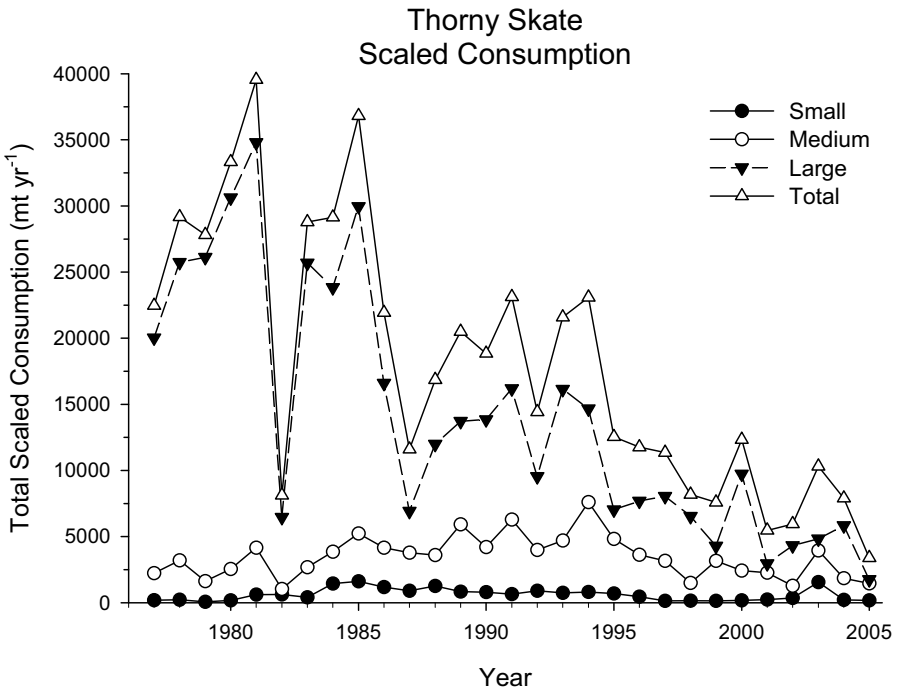


Figure B6.26b. The annual total consumption (MT yr^{-1}) of Thorny skate for the strata set and time period noted.

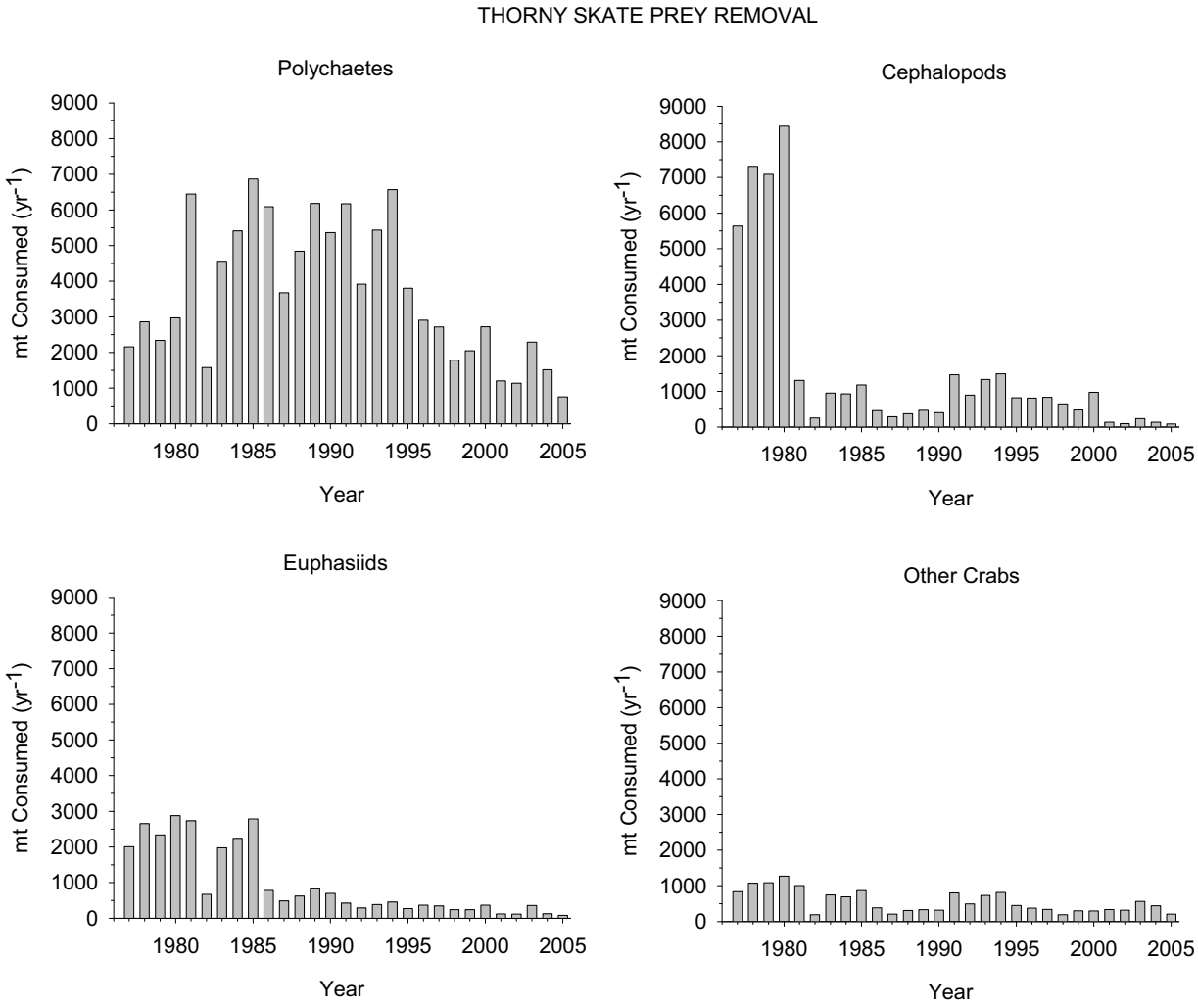


Figure B6.27. The amount of prey consumed (MT yr-1) by Thorny skate for the strata set and time period noted. These estimates represent the combination of total annual total consumption and the diet compositions of Thorny skate. These prey were selected as some of the major prey (>>5 % of diet composition) of Thorny skate.

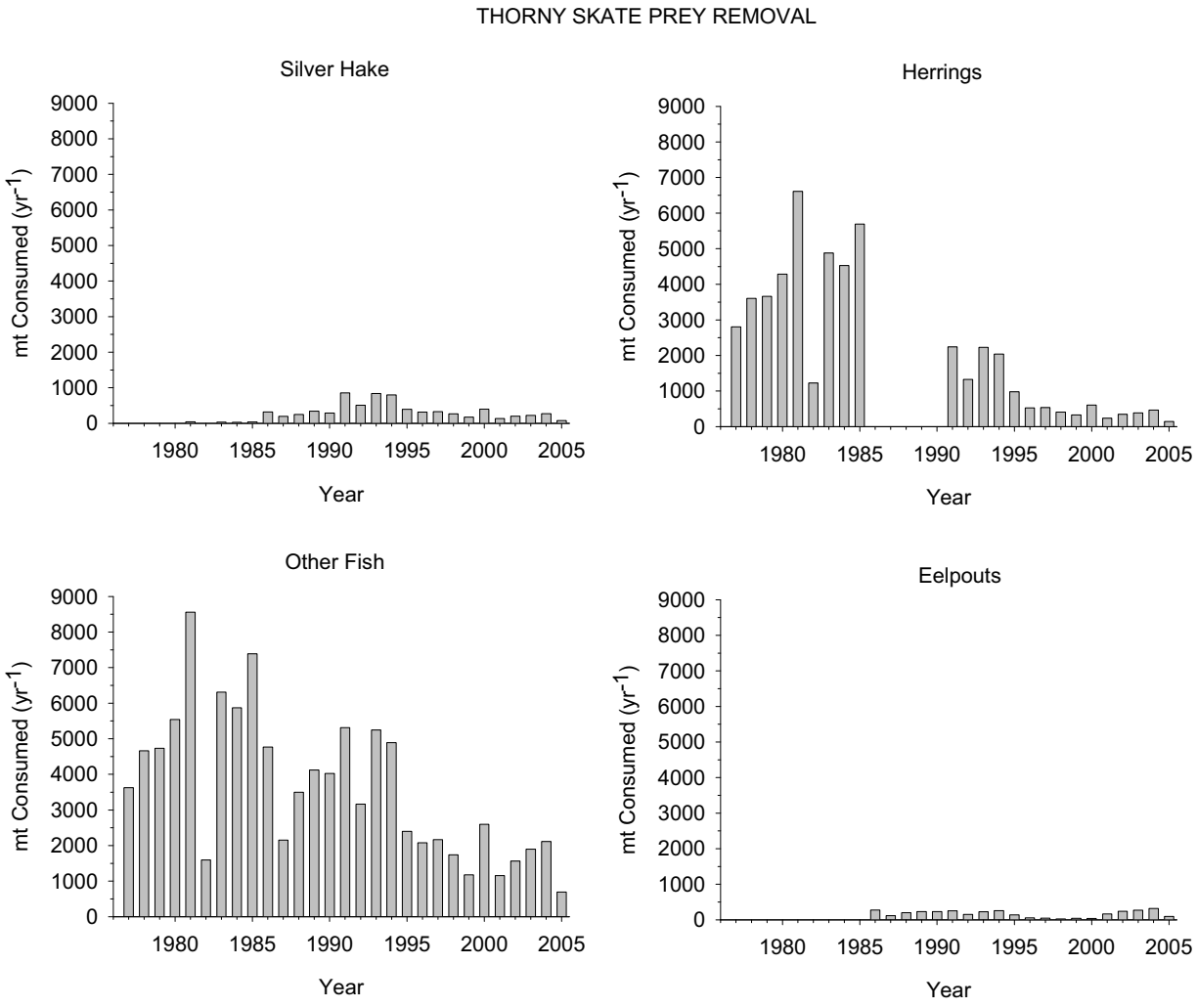


Figure B6.28. The amount of prey consumed (MT yr-1) by Thorny skate for the strata set and time period noted. These estimates represent the combination of total annual total consumption and the diet compositions of Thorny skate. These prey were selected as some of the major prey (>>5 % of diet composition) of Thorny skate.

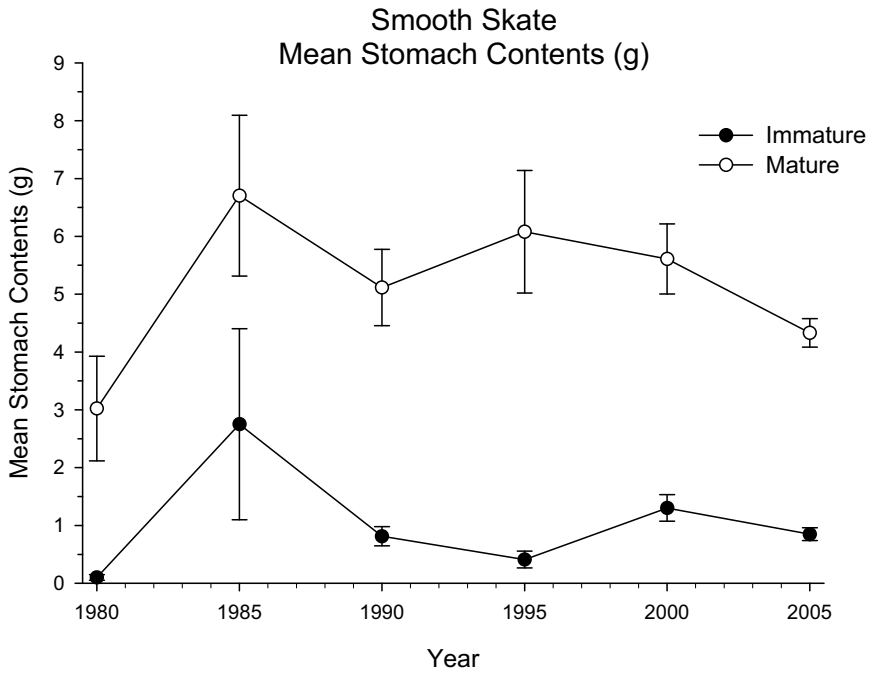


Figure B6.29a. The annual mean stomach contents (0.1 g) of Smooth skate for the strata set and time period noted. Each size class is noted. Error bars are ± 1 S.E.

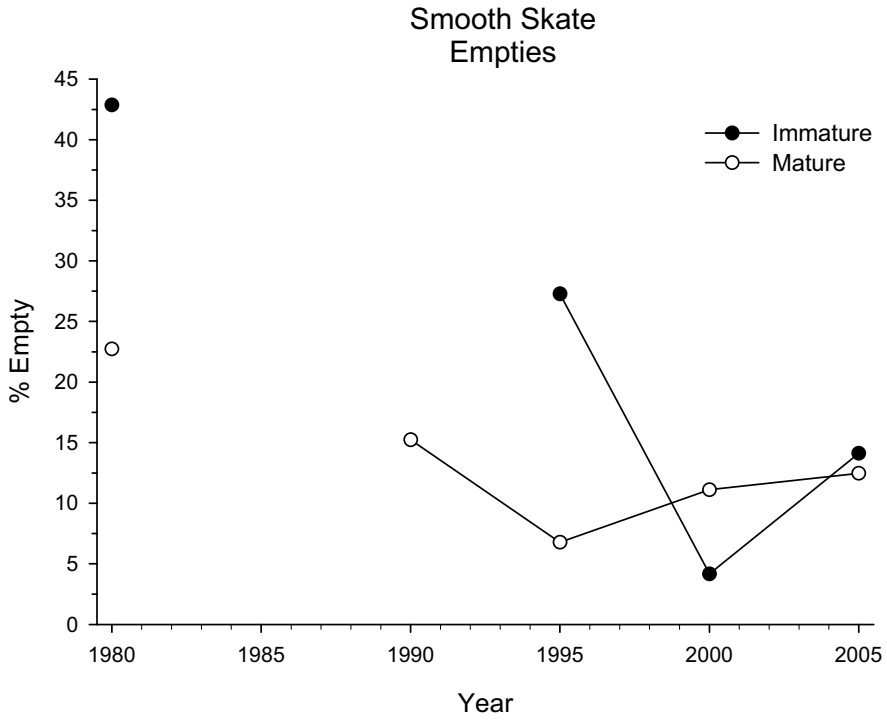


Figure B6.29b. The percentage of stomachs that were empty (i.e., containing no prey) of smooth skate for the strata set and time period noted. Each size class is noted

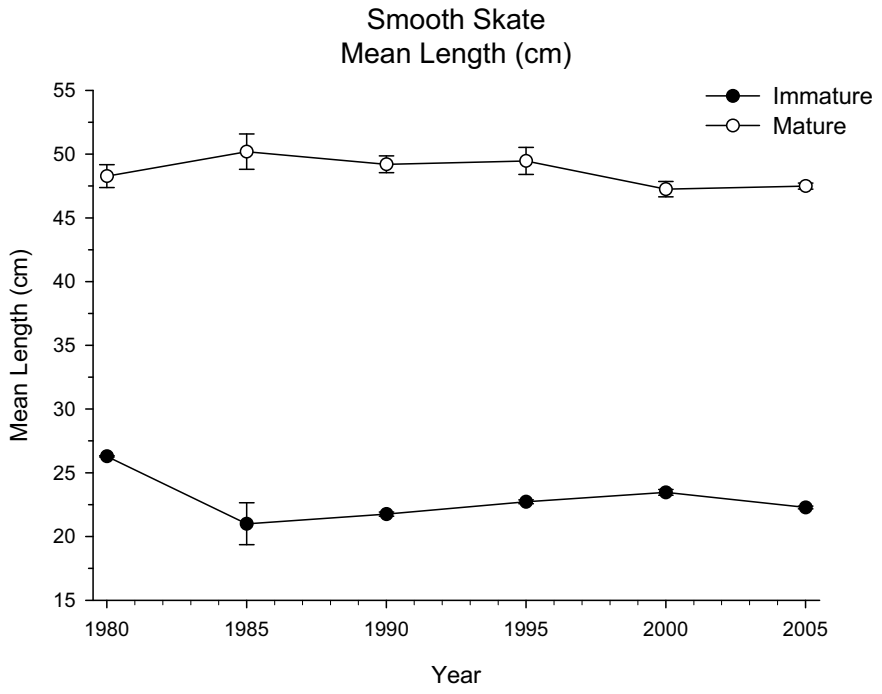


Figure B6.30a. The mean length (1 cm) of Smooth skate from which stomach samples were collected, for the strata set and time period noted. Each size class is noted. Error bars are ± 1 S.E.

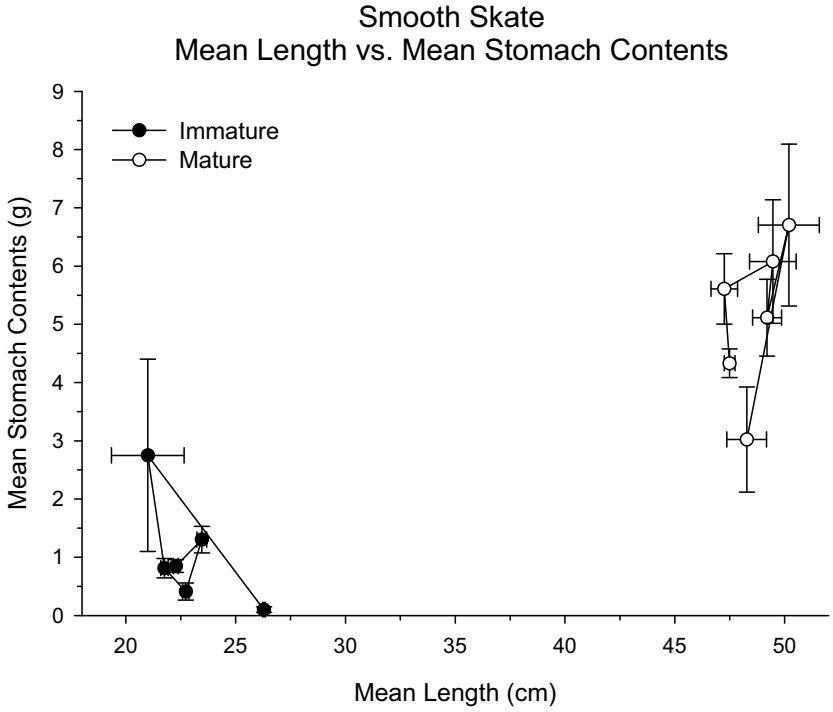


Figure B6.30b. The annual mean stomach contents (0.1 g) and the mean length (1 cm) of Smooth skate for the strata set and time period noted. Each size class is noted. Error bars are ± 1 S.E.

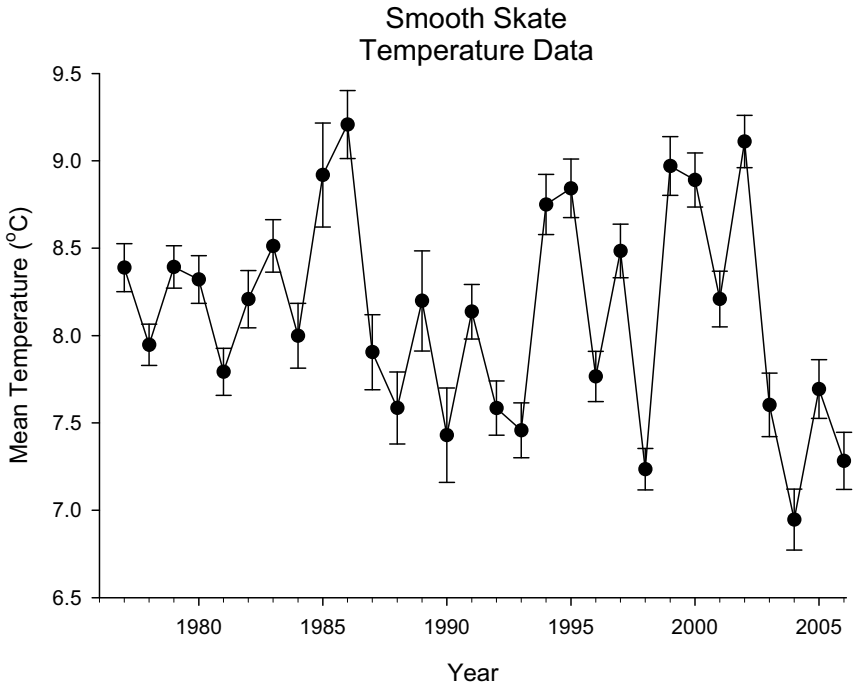


Figure B6.31a. The annual mean bottom temperature (0.1 ^{O}C) for the selected strata set, as taken from the bottom trawl survey over the time period noted. Error bars are ± 1 S.E.

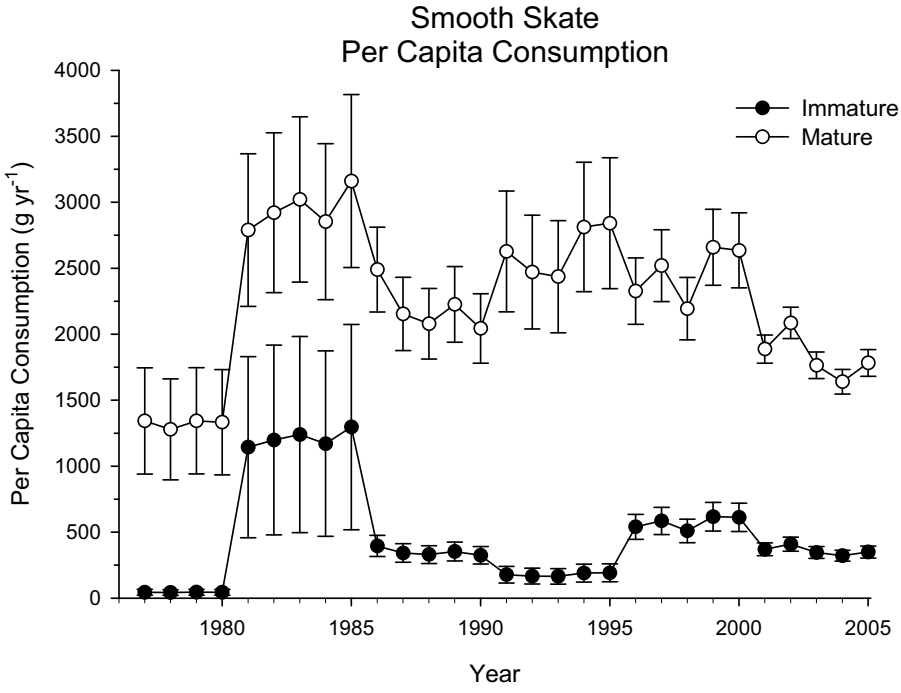


Figure B6.31b. The annual per capita consumption (g yr^{-1}) of Smooth skate for the strata set and time period noted. Each size class is noted. Error bars are ± 1 S.E.

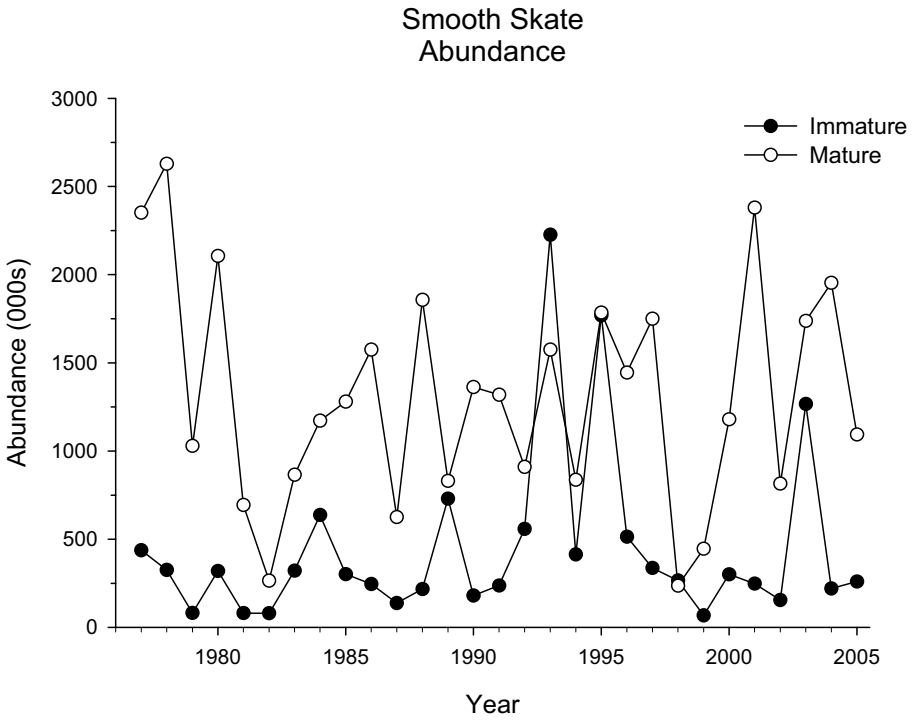


Figure B6.32a. The annual mean swept area abundance of Smooth skate for the strata set and time period noted. Each size class is noted.

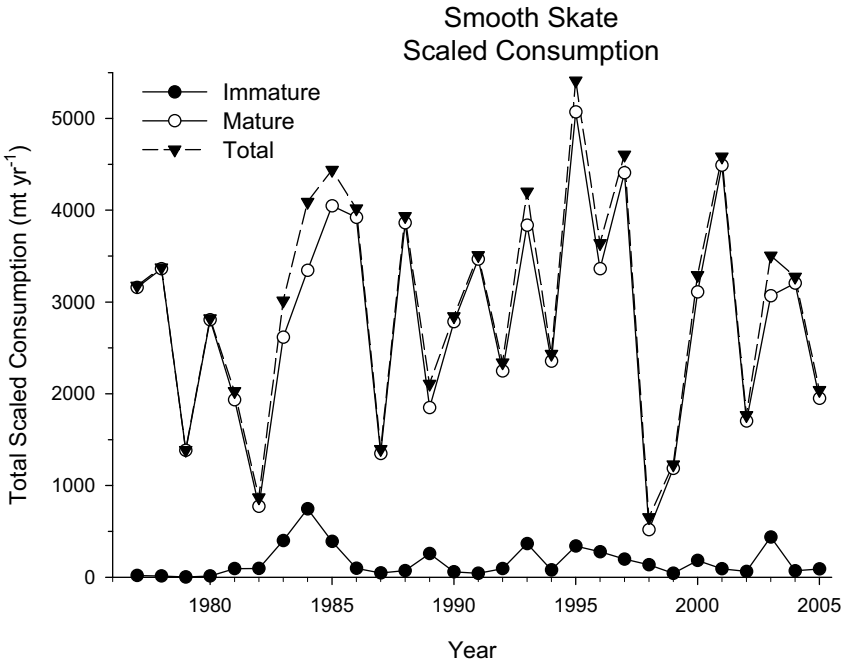


Figure B6.32b. The annual total consumption (MT yr^{-1}) of Smooth skate for the strata set and time period noted.

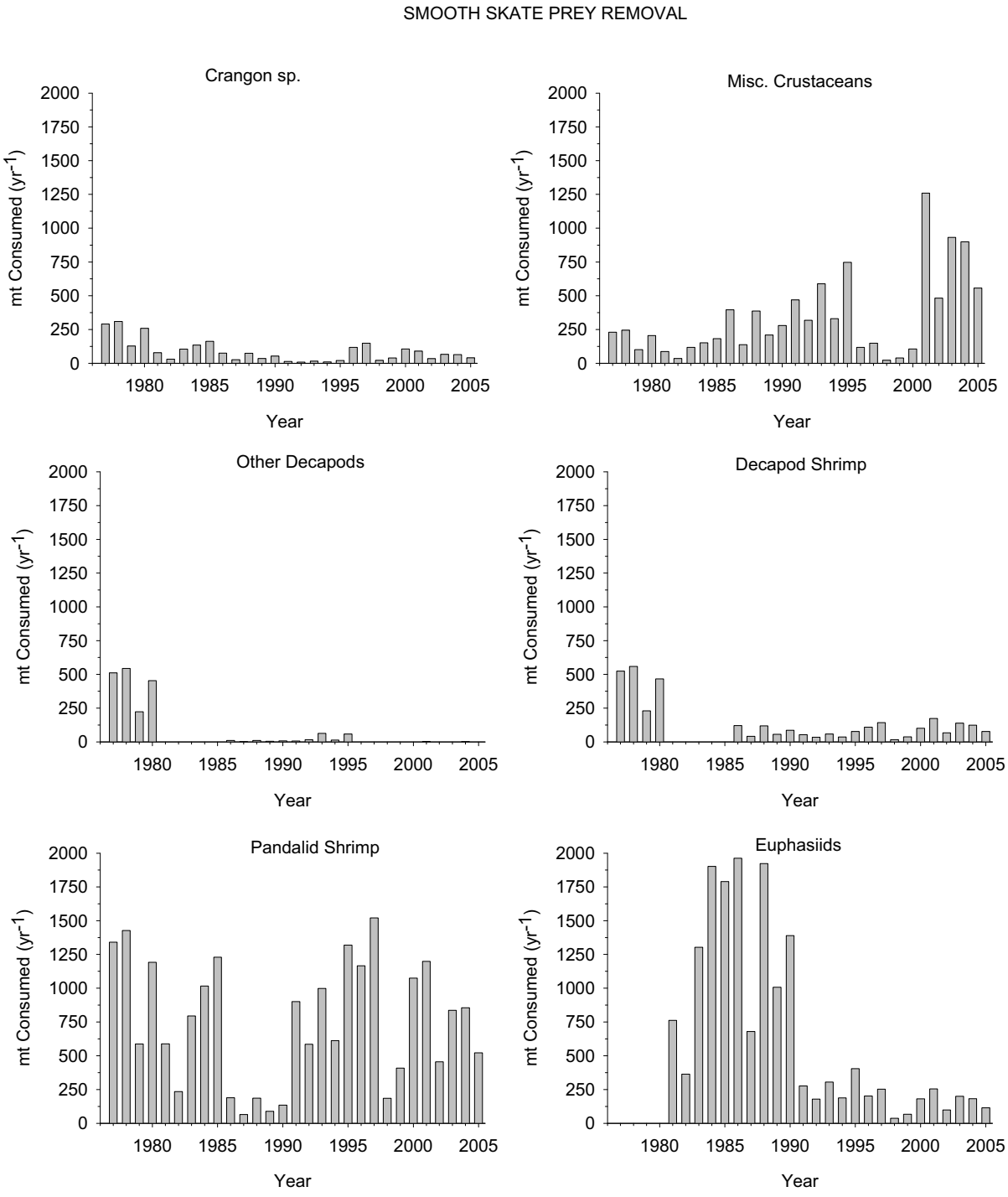


Figure B6.33. The amount of prey consumed (MT yr-1) by Smooth skate for the strata set and time period noted. These estimates represent the combination of total annual total consumption and the diet compositions of Smooth skate. These prey were selected as some of the major prey (>>5 % of diet com osition of Smooth skate.

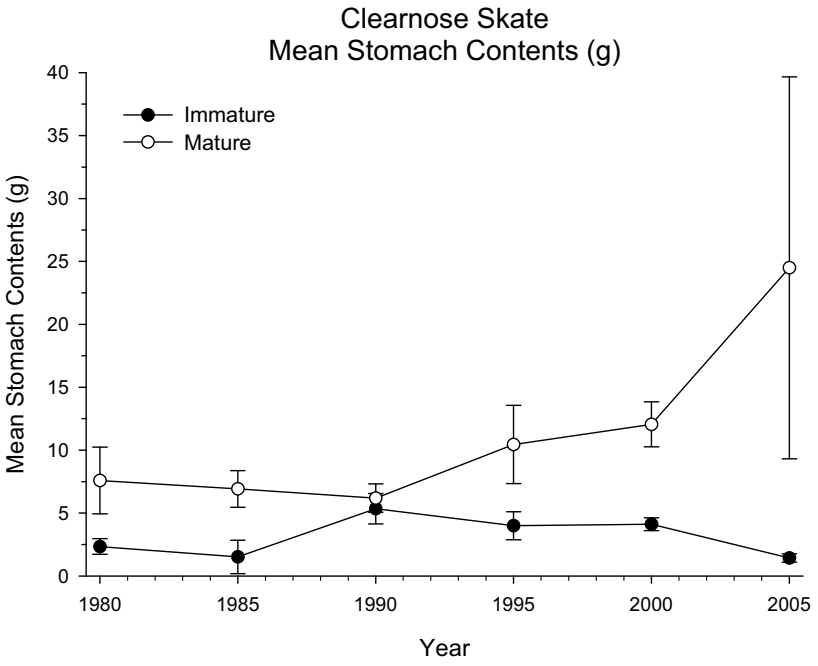


Figure B6.34a. The annual mean stomach contents (0.1 g) of Clearnose skate for the strata and time period noted. Each size class is noted. Error bars are ± 1 S.E.

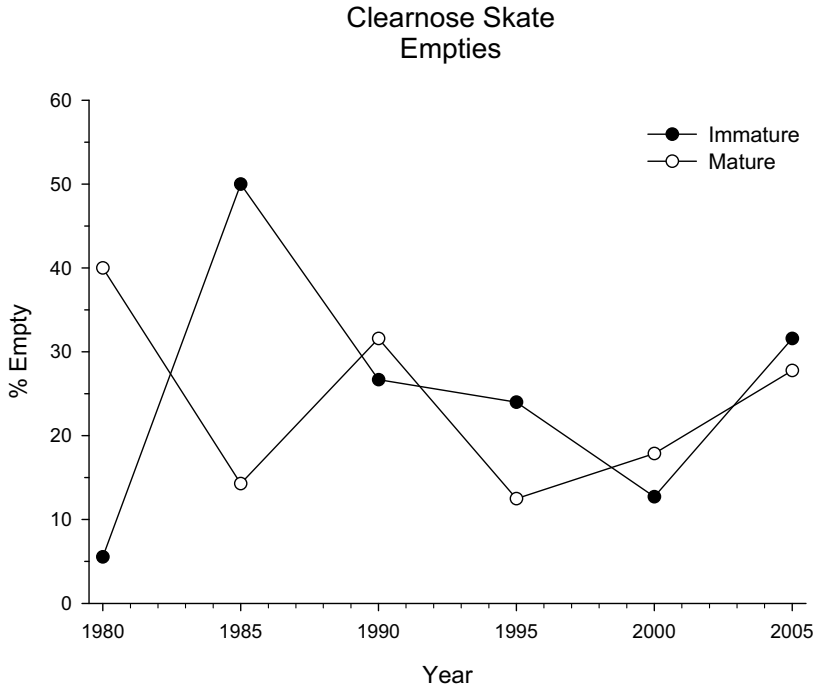


Figure B6.34b. The percentage of stomachs that were empty (i.e., containing no prey) of Clearnose skate for the strata set and time period noted. Each size class is noted

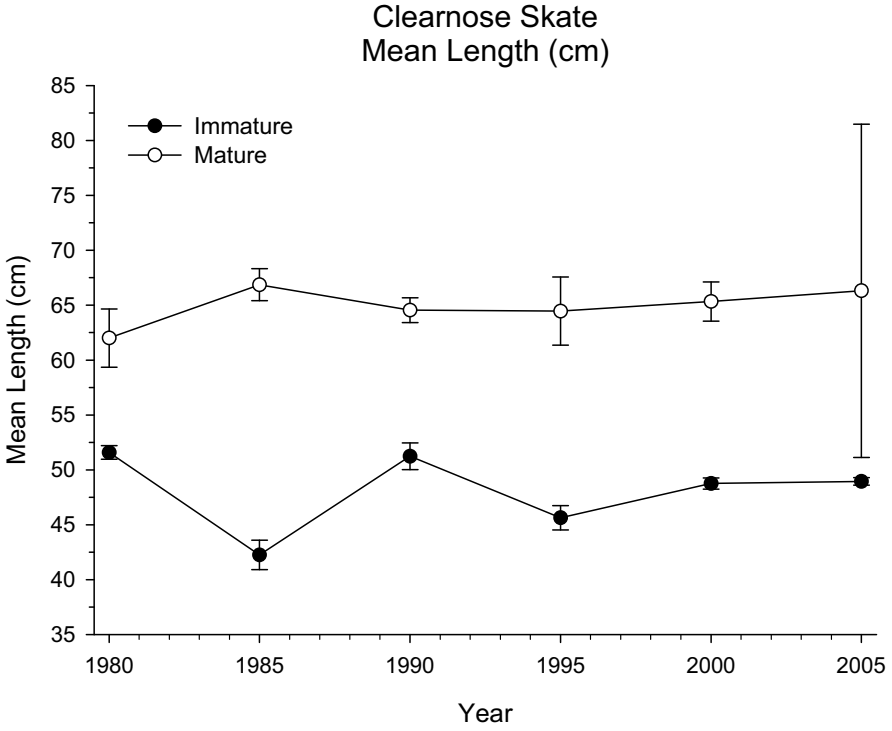


Figure B6.35a. The mean length (1 cm) of Clearnose skate from which stomach sample were collected, for the strata set and time period noted. Each size class is noted. Error bars are ± 1 S.E.

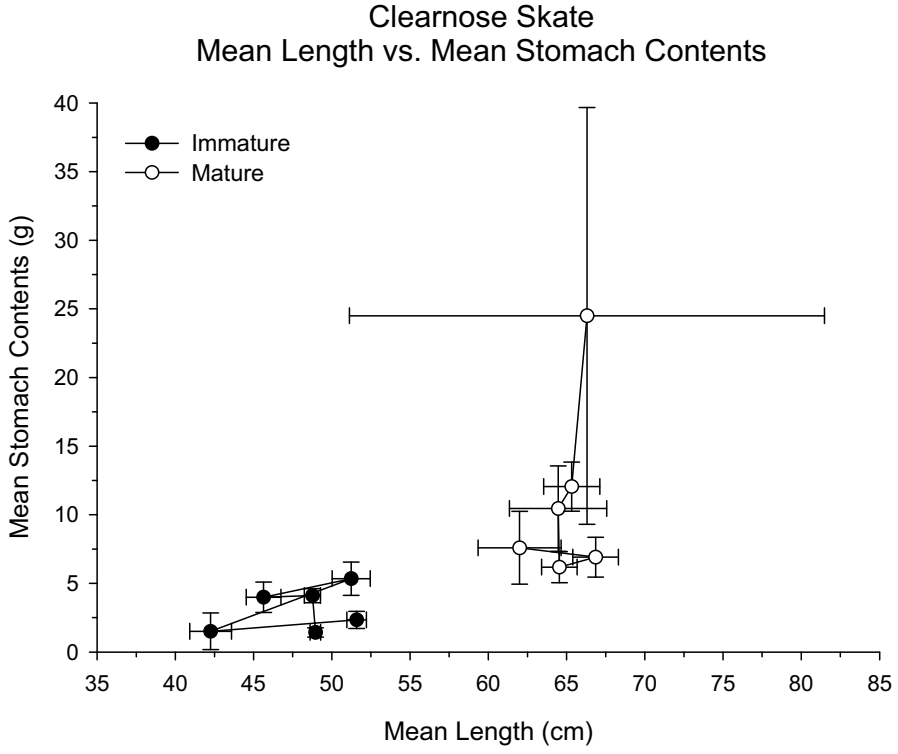


Figure B6.35b. The annual mean stomach contents (0.1 g) and the mean length (1 cm) of Clearnose skate for the strata set and time period noted. Each size class is noted. Error bars are ± 1 S.E.

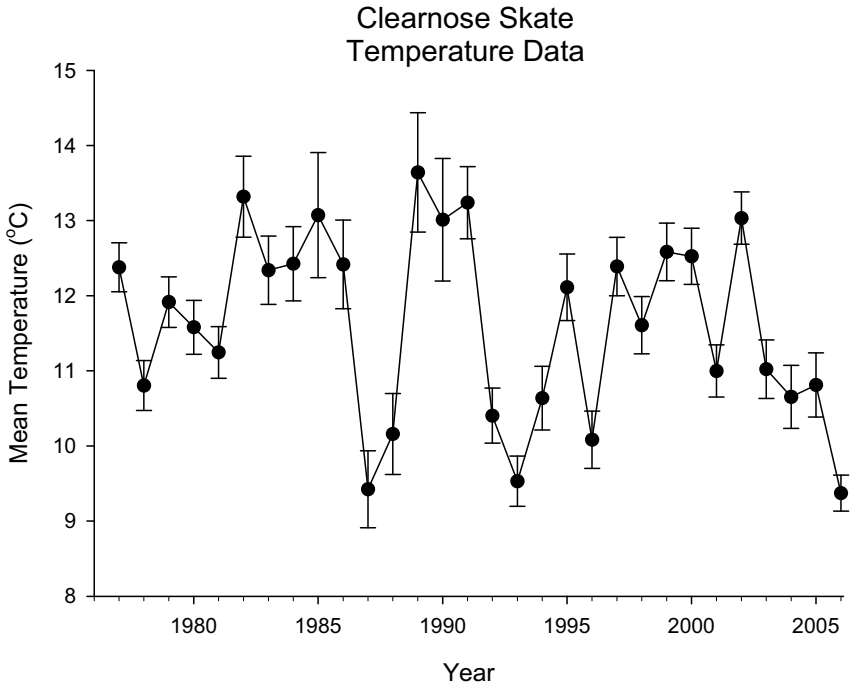


Figure B6.36a. The annual mean bottom temperature (0.1 ^{O}C) for the selected strata set as taken from the bottom trawl survey over the time period noted. Error bars are ± 1 S.E.

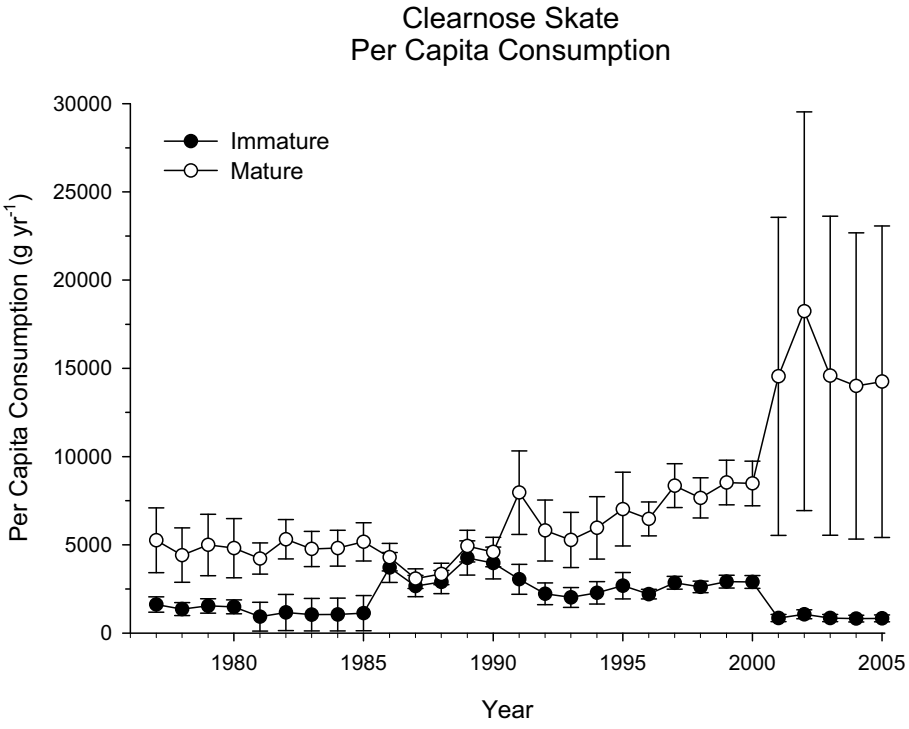


Figure B6.36b. The annual per capita consumption (g yr^{-1}) of Clearnose skate for the strata set and time period noted. Each size class is noted. Error bars are ± 1 S.E.

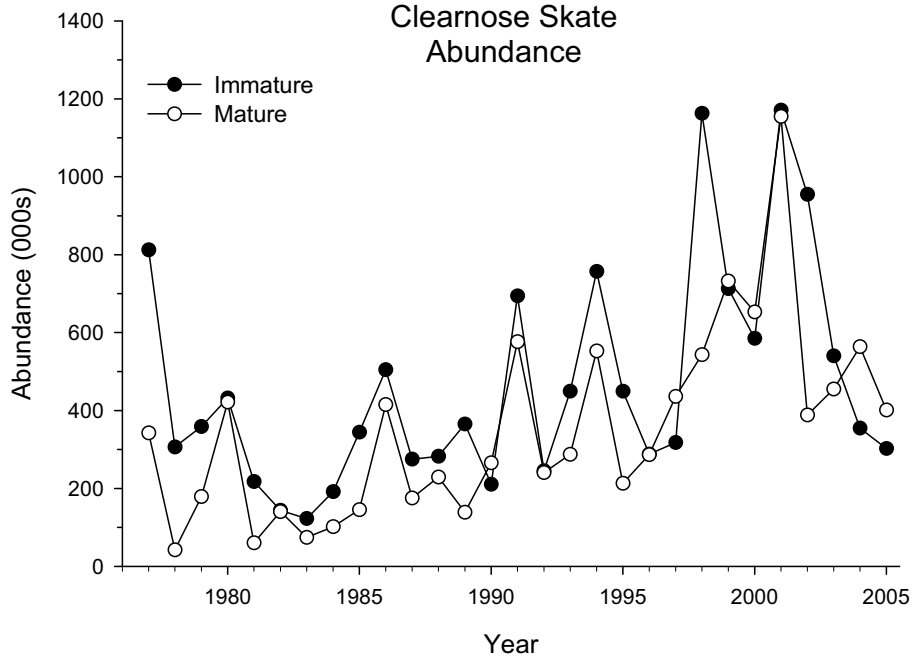


Figure B6.37a. The annual mean swept area abundance of Clearnose skate for the strata set and time period noted. Each size class is noted.

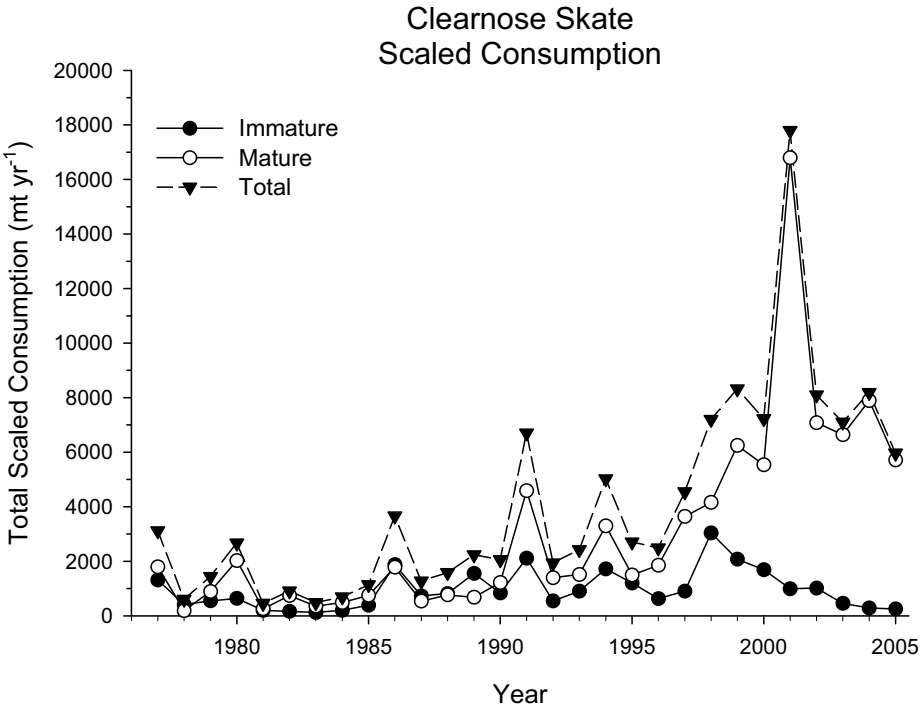


Figure B6.37b. The annual total consumption (MT yr^{-1}) of Clearnose skate for the strata set and time period noted.

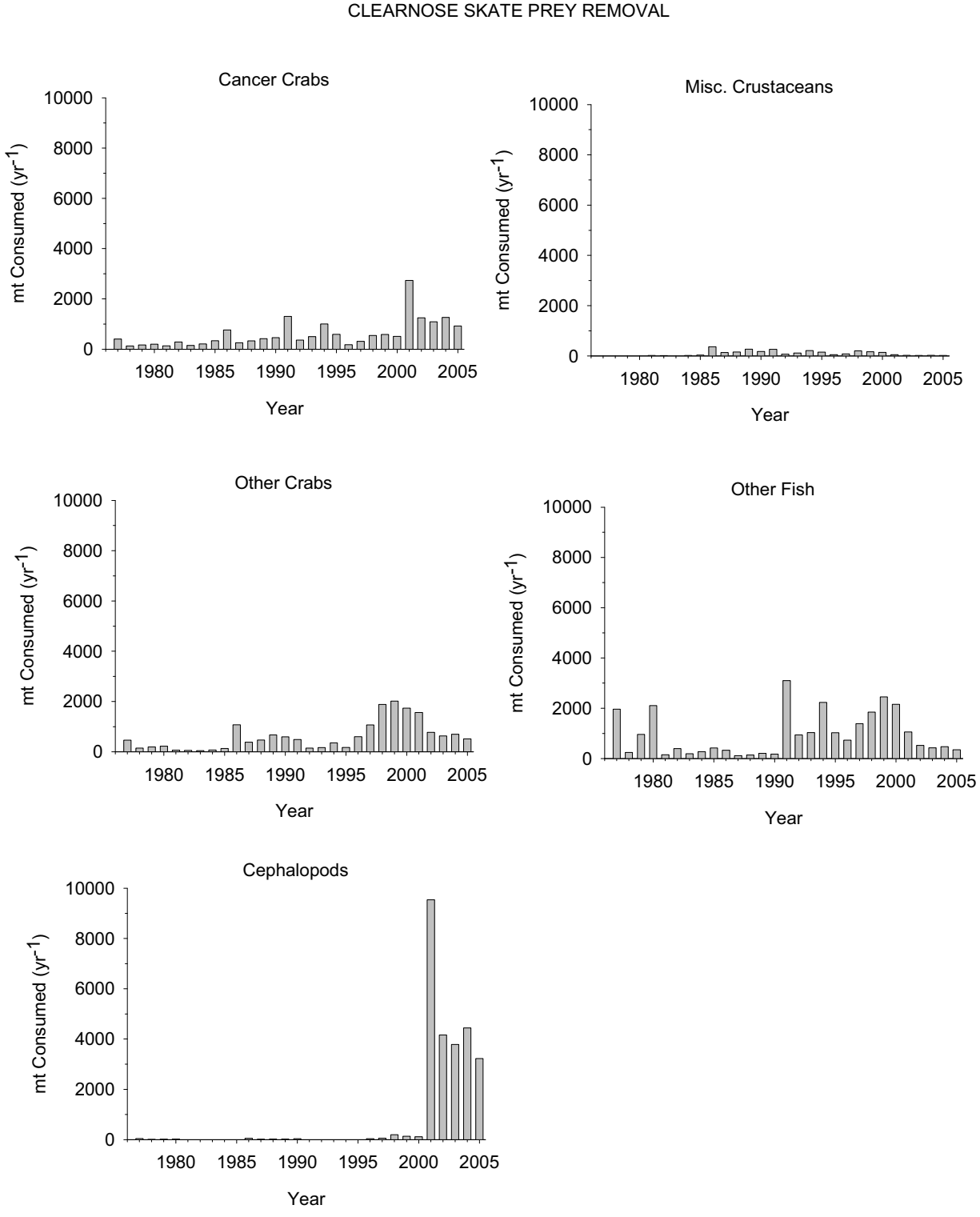


Figure B6.38. The amount of prey consumed (MT yr-1) by Clearnose skate for the strata set and time period noted. These estimates represent the combination of total annual total consumption and the diet compositions of Clearnose skate. These prey were selected as some of the major prey (>>5 % of diet composition) of Clearnose skate.

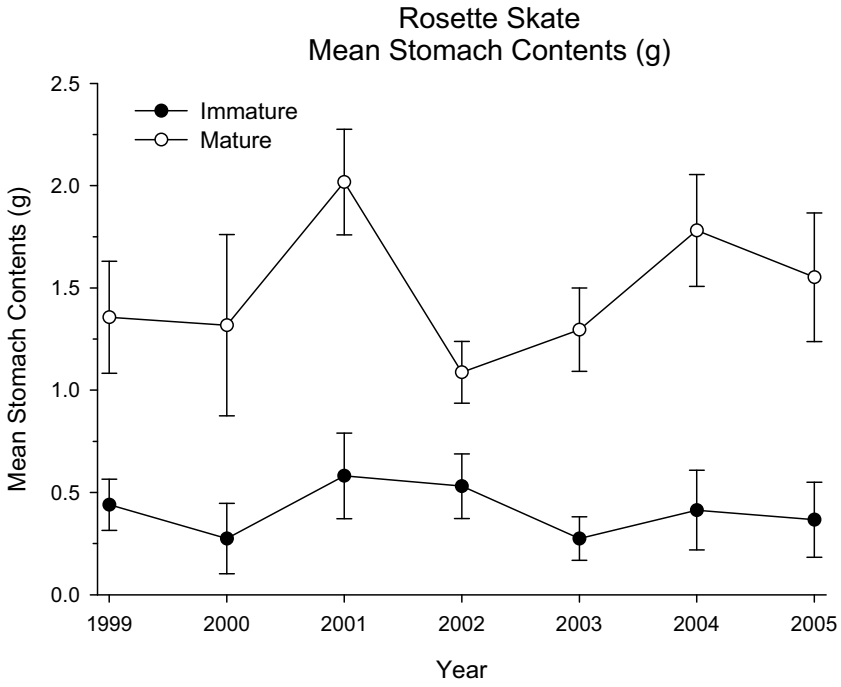


Figure B6.39a. The annual mean stomach contents (0.1 g) of Rosette skate for the strata set and time period noted. Each size class is noted. Error bars are ± 1 S.E.

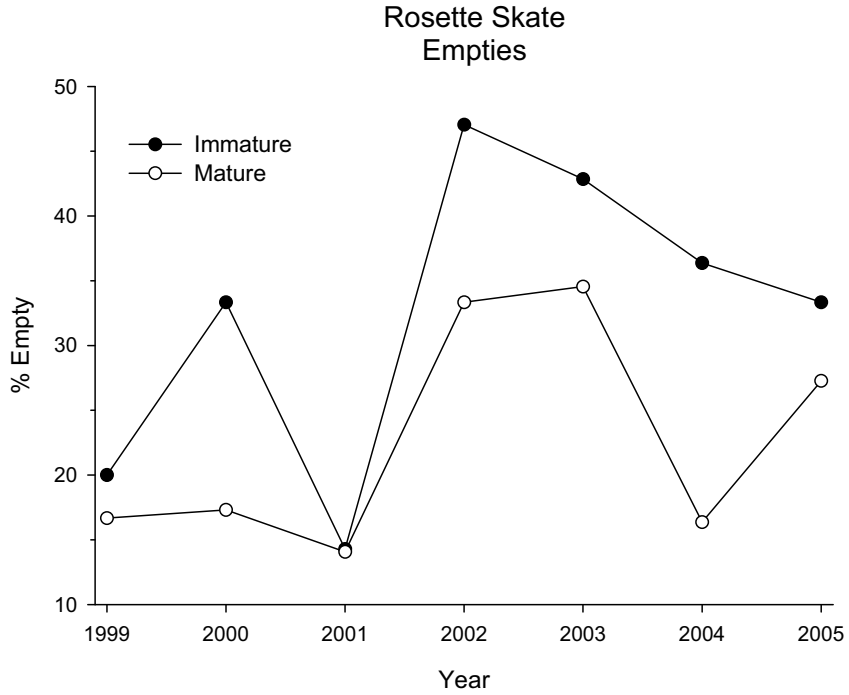


Figure B6.39b. The percentage of stomachs that were empty (i.e., containing no prey) of Rosette skate for the strata set and time period noted. Each size class is noted

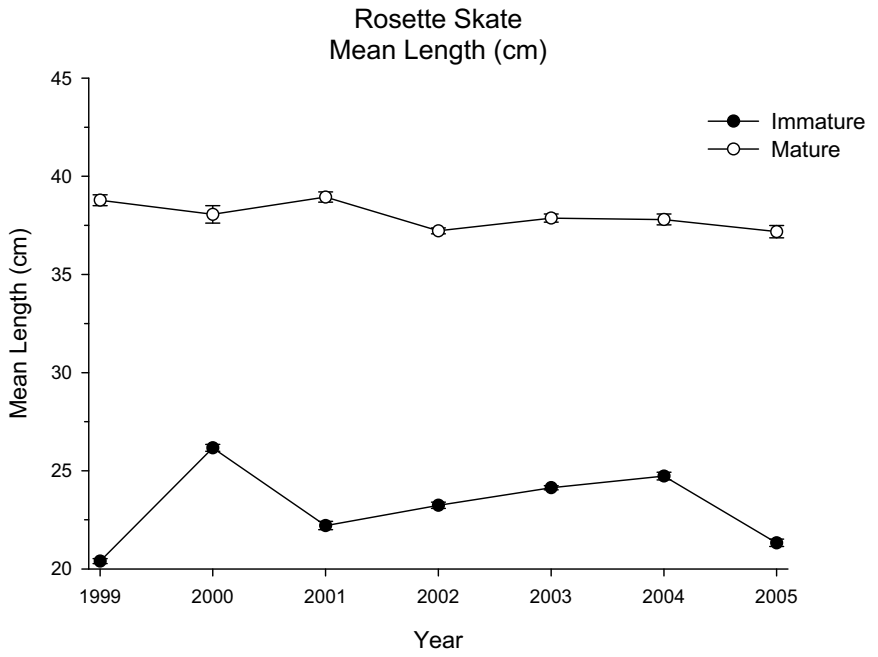


Figure B6.40a. The mean length (1 cm) of Rosette skate from which stomach samples were collected, for the strata set and time period noted. Each size class is noted. Error bars are ± 1 S.E.

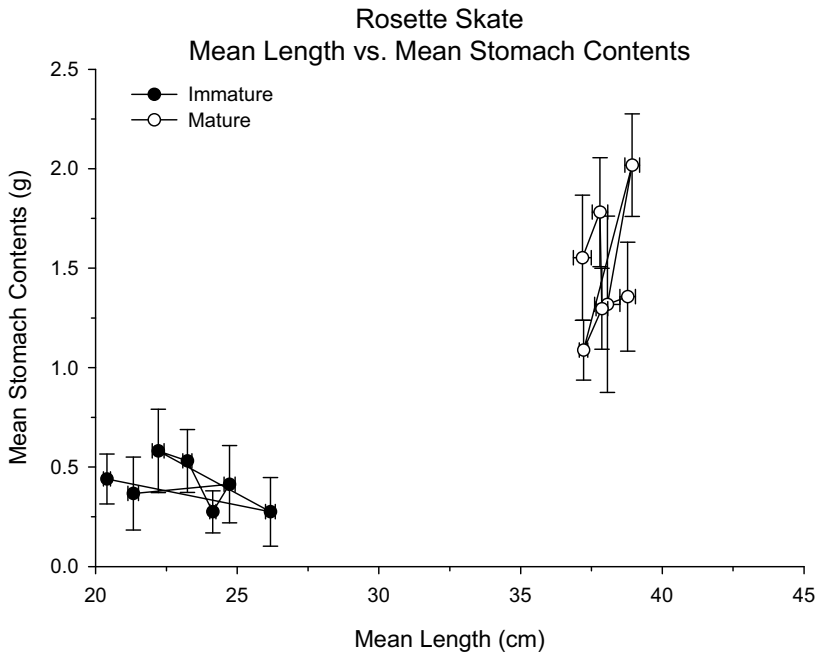


Figure B6.40b. The annual mean stomach contents (0.1 g) and the mean length (1 cm) of Rosette skate for the strata set and time period noted. Each size class is noted. Error bars are ± 1 S.E.

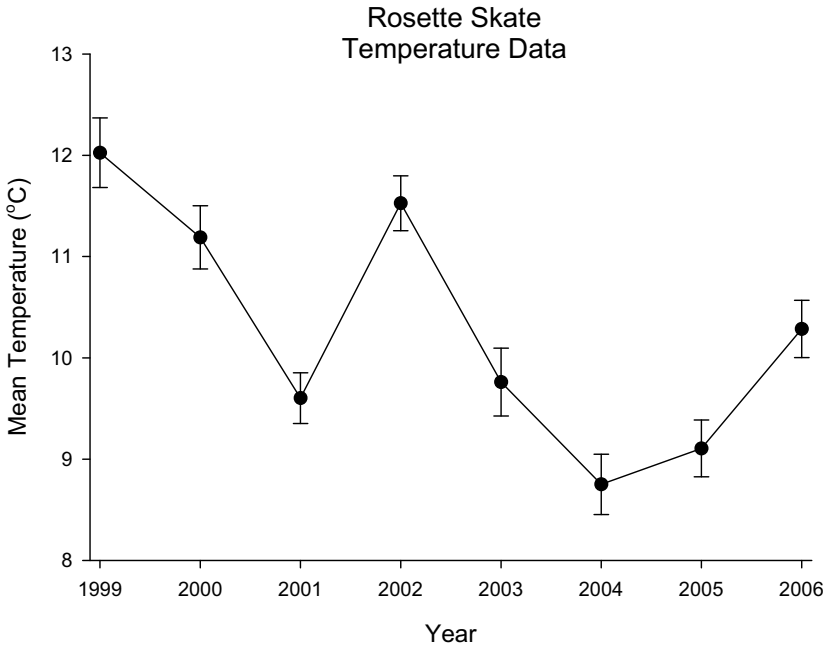


Figure B6.41a. The annual mean bottom temperature (0.1 ^{o}C) for the selected strata set, as taken from the bottom trawl survey over the time period noted. Error bars are ± 1 S.E.

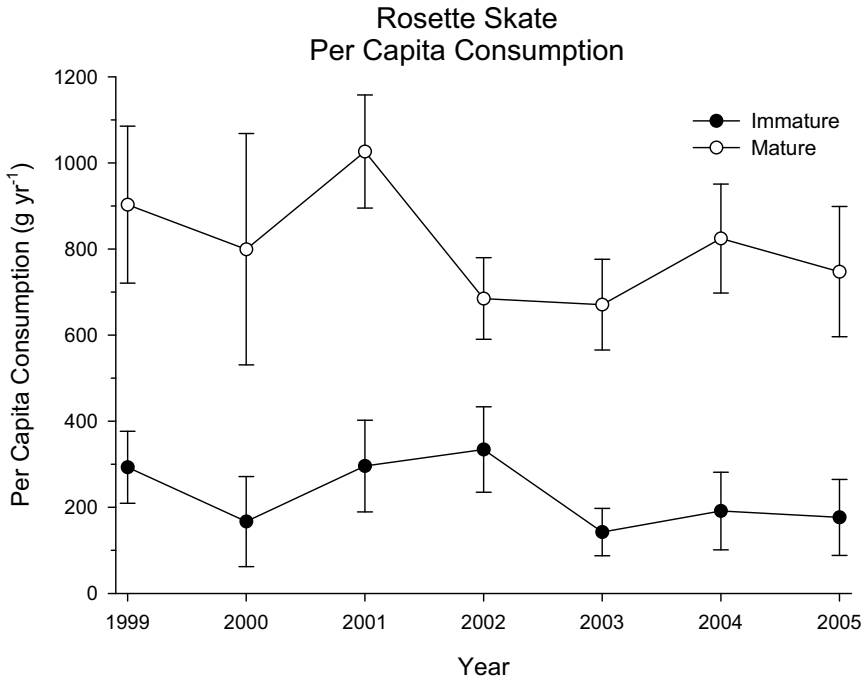


Figure B6.41b. The annual per capita consumption (g yr^{-1}) of Rosette skate for the strata set and time period noted. Each size class is noted. Error bars are ± 1 S.E.

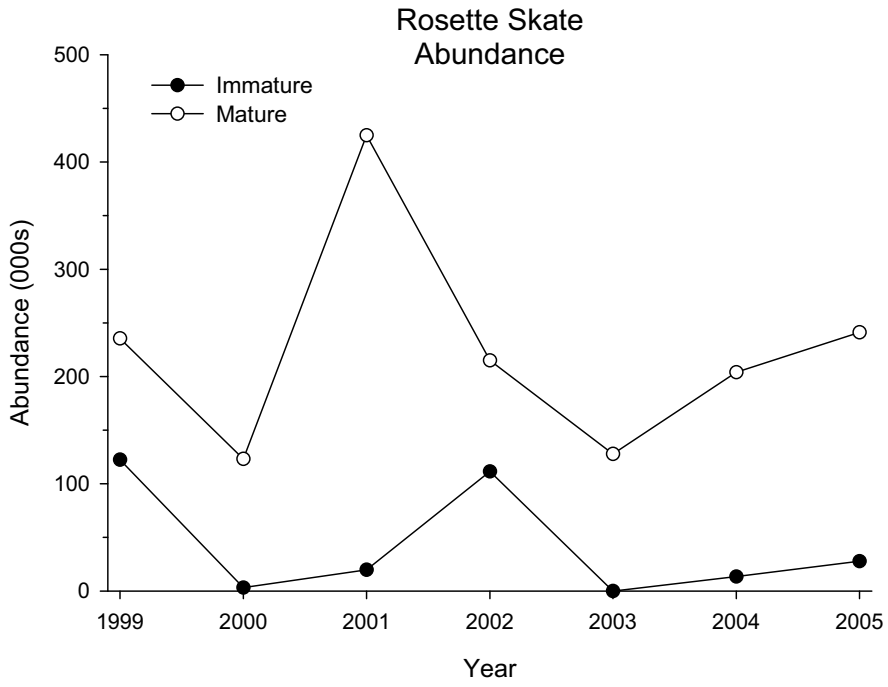


Figure B6.42a. The annual mean swept area abundance of Rosette skate for the strata set and time period noted. Each size class is noted.

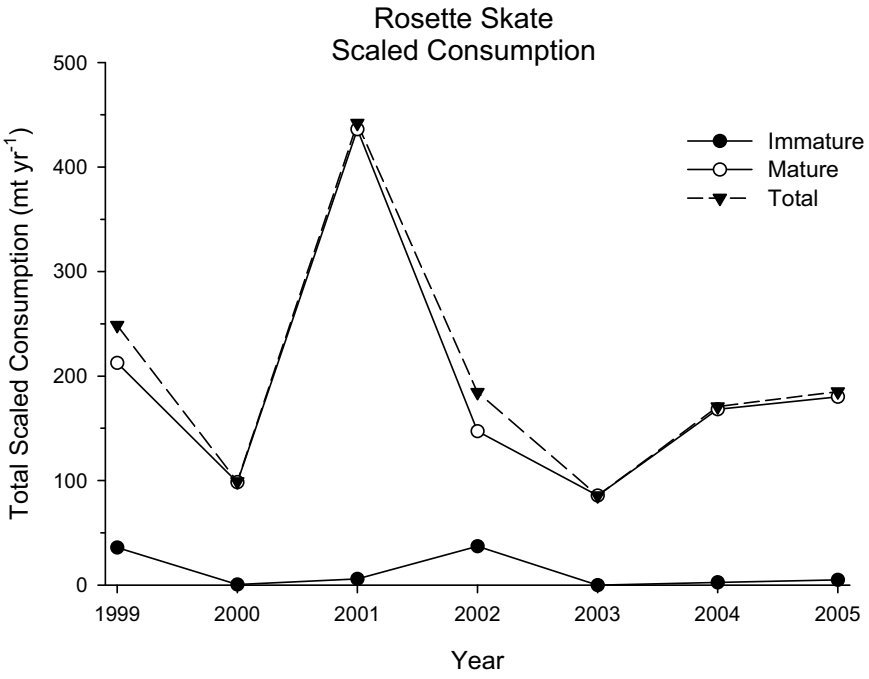


Figure B6.42b. The annual total consumption (MT yr^{-1}) of Rosette skate for the strata set and time period noted.

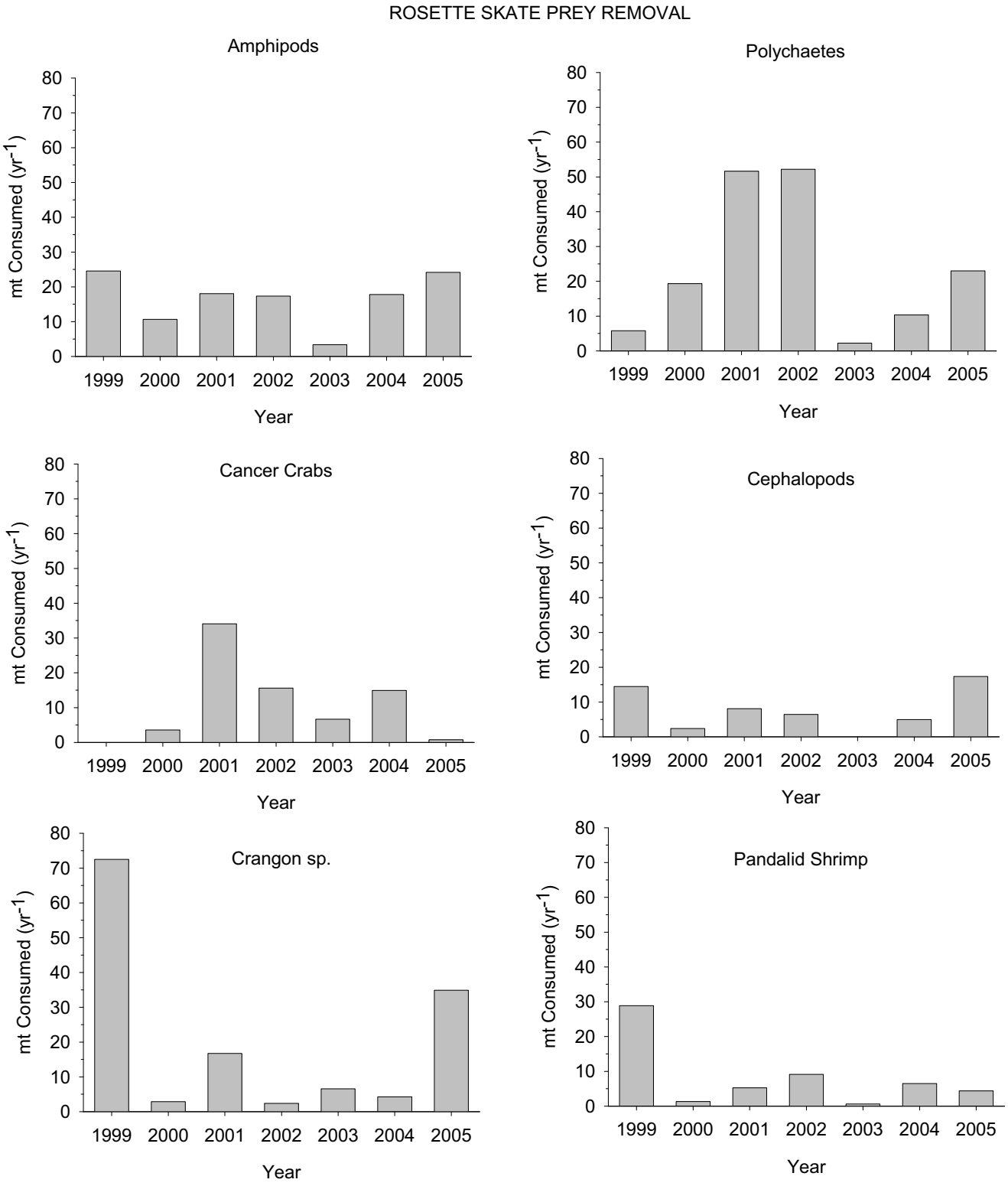
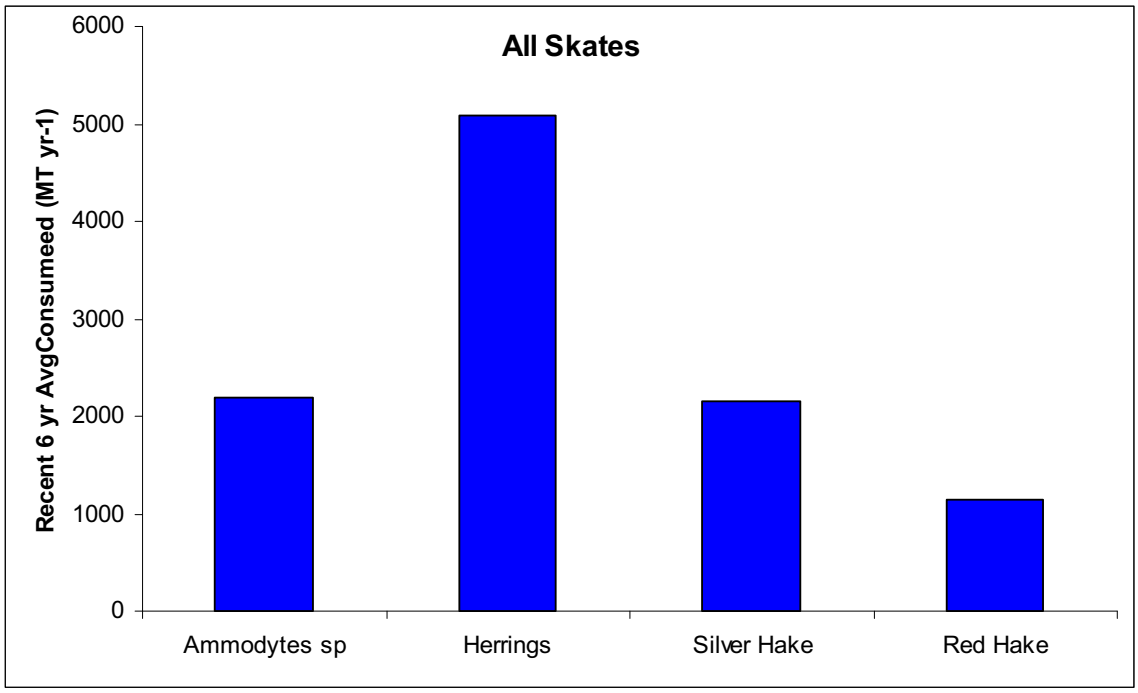


Figure B6.43. The amount of prey consumed (MT yr^{-1}) by Rosette skate for the strata set and time period noted. These estimates represent the combination of total annual total consumption and the diet compositions of Rosette skate. These prey were selected as some of the major prey (>>5 % of diet composition) of Rosette skate.



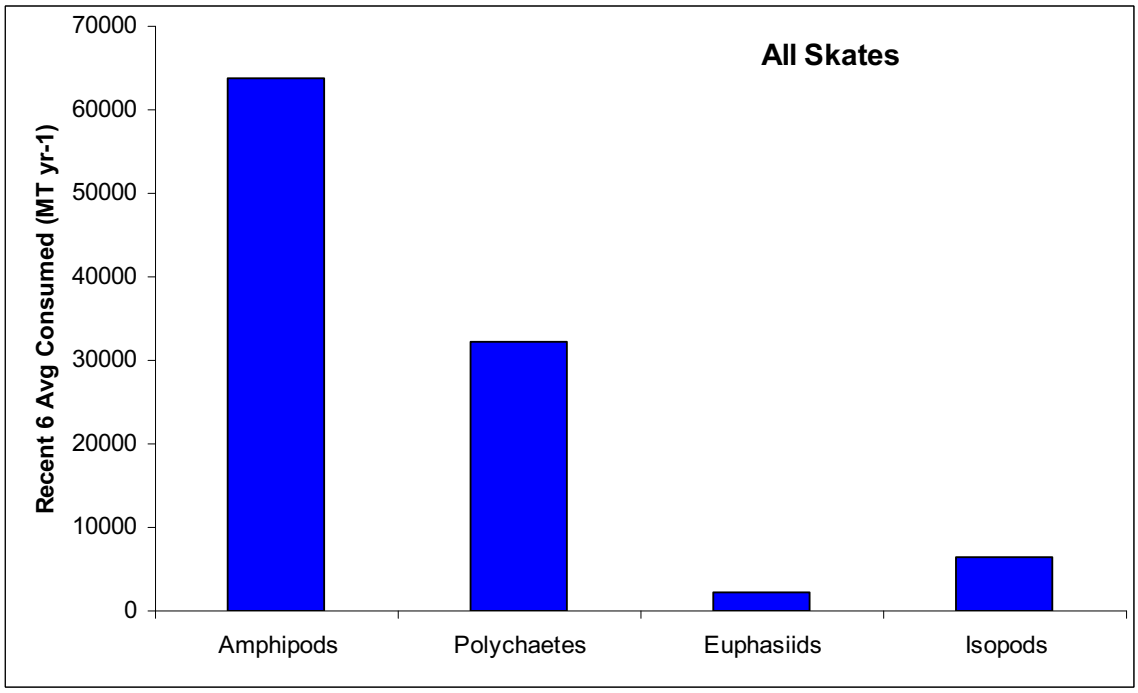


Figure B6.44. Average amount of major prey consumed by all skates from 2000-2005. A. fish prey. B. invertebrate prey.