

RED CRAB FIGURES

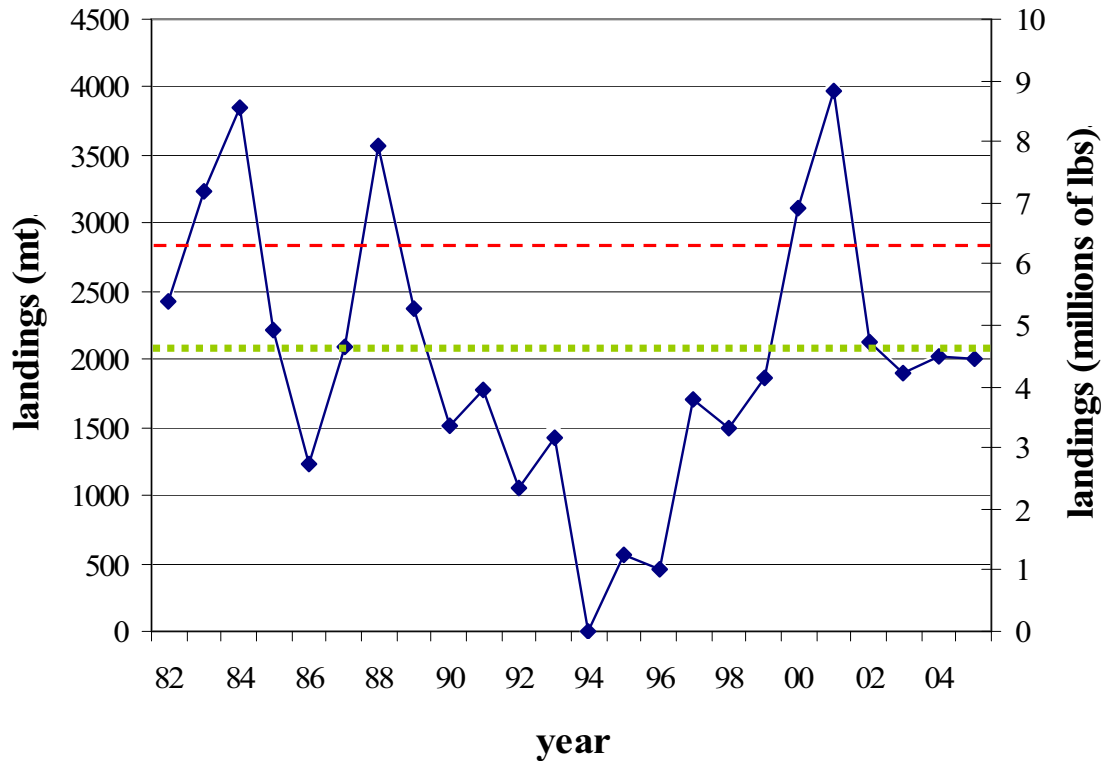


Figure D2.1 Reported landings of deep sea red crab 1982-2005. The dashed line indicates an MSY of 2714 mt (6.24 million lbs) which was based on the previous assessment (Serchuk 1977). The dotted line represents the mean annual landings 1982-2005, excluding 1994 when there was no targeted red crab fishery.

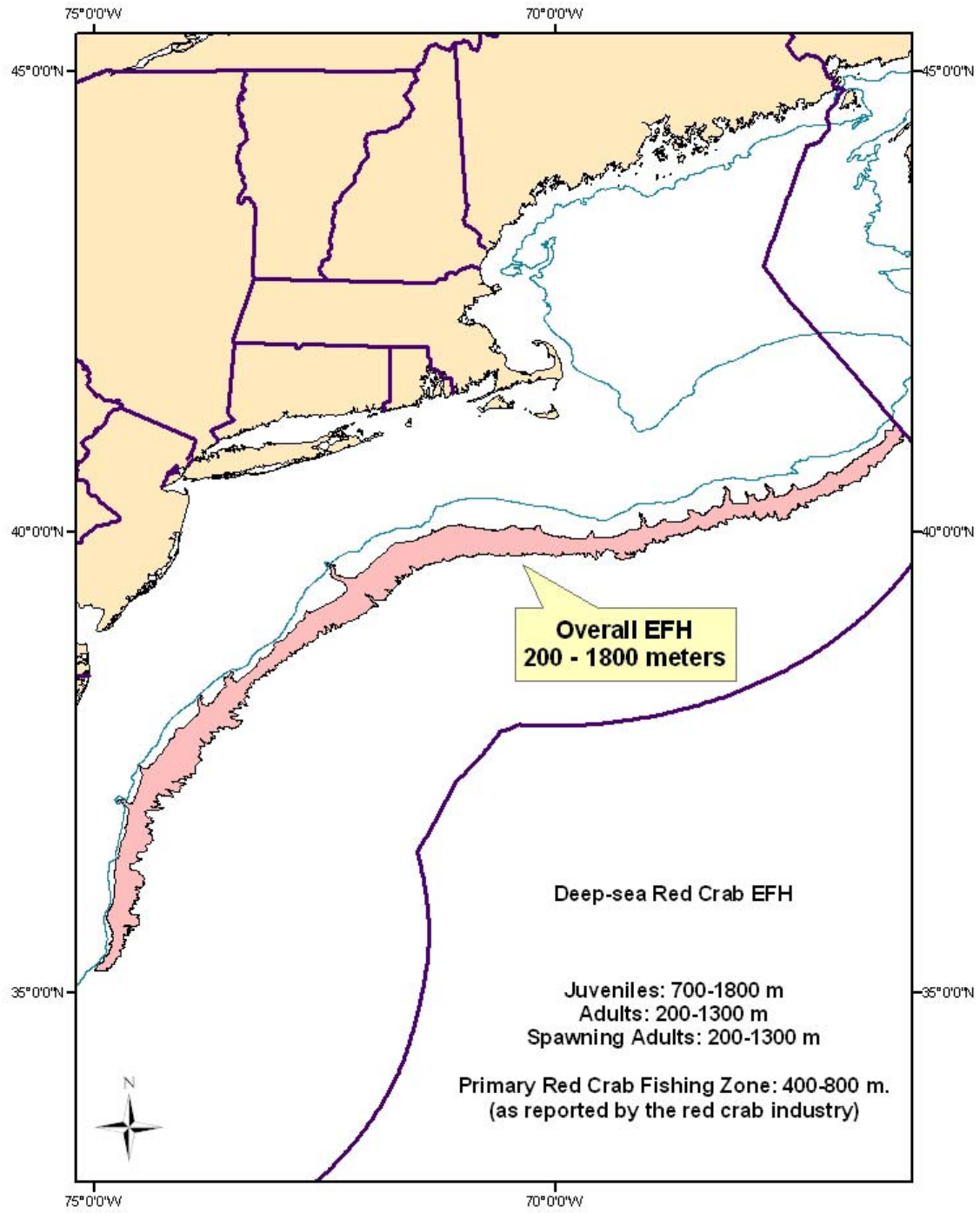


Figure D3.1 Red Crab Essential Fish Habitat by life stage (200-1800 meters).

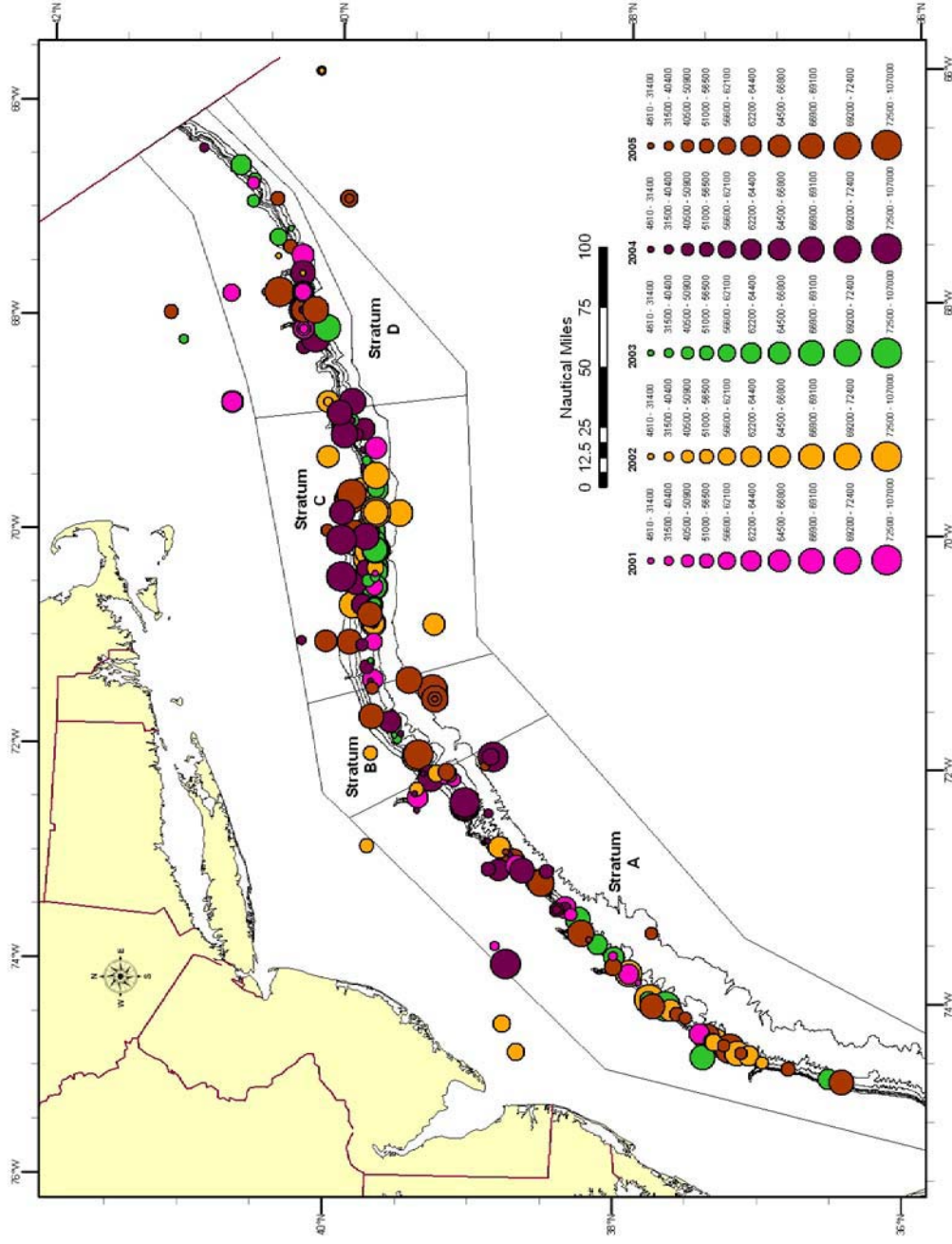


Figure D4.1 Reported VTR landings per trip in pounds for vessels targeting red crab during 2001-2005, showing boundaries of survey strata. Isobaths on the map are 200, 300, 400, 500, 900, 1300, and 2100 m. (Outlying catches probably did not occur in that location, but are a result of errors in reporting or transcription of latitude or longitude.)

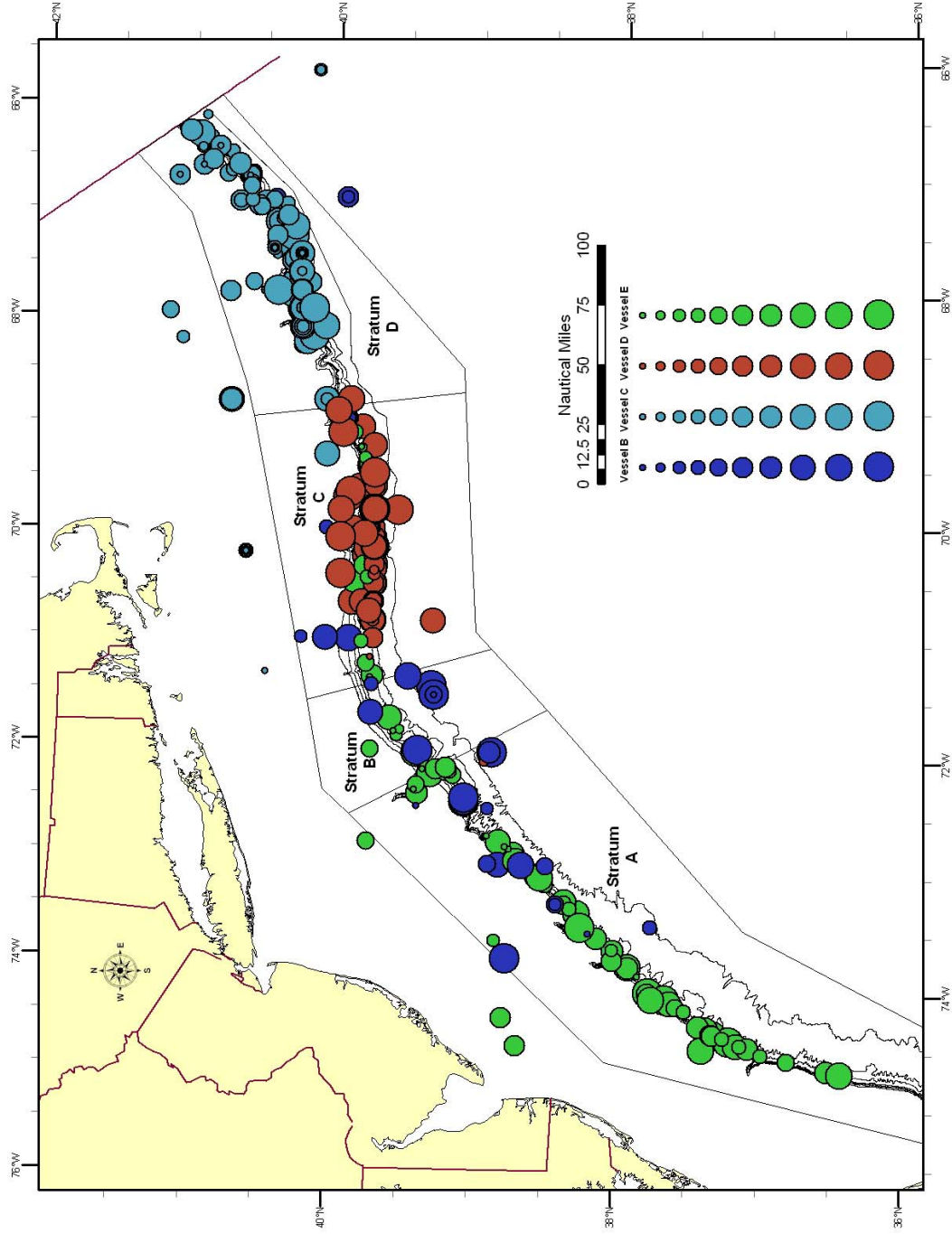


Figure D4.2 VTR landings per trip by vessel (coded A-D) for 1995-2005, showing boundaries of survey strata. The amount landed per trip is not shown for confidentiality reasons, but ranged from 0.3 to 33 mt. (Outlying catches probably did not occur in that location, but are a result of errors in reporting or transcription of latitude or longitude.)

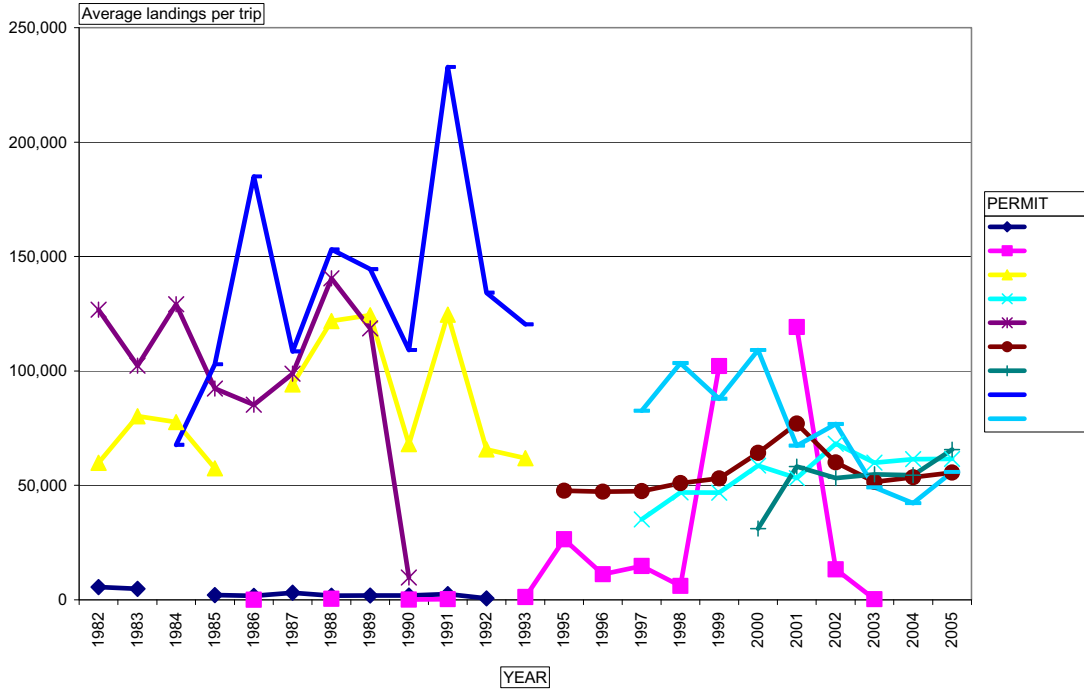


Figure D4.3 Trends in landings (lbs) per trip by vessels with large amounts of crab landings in dealer reports.

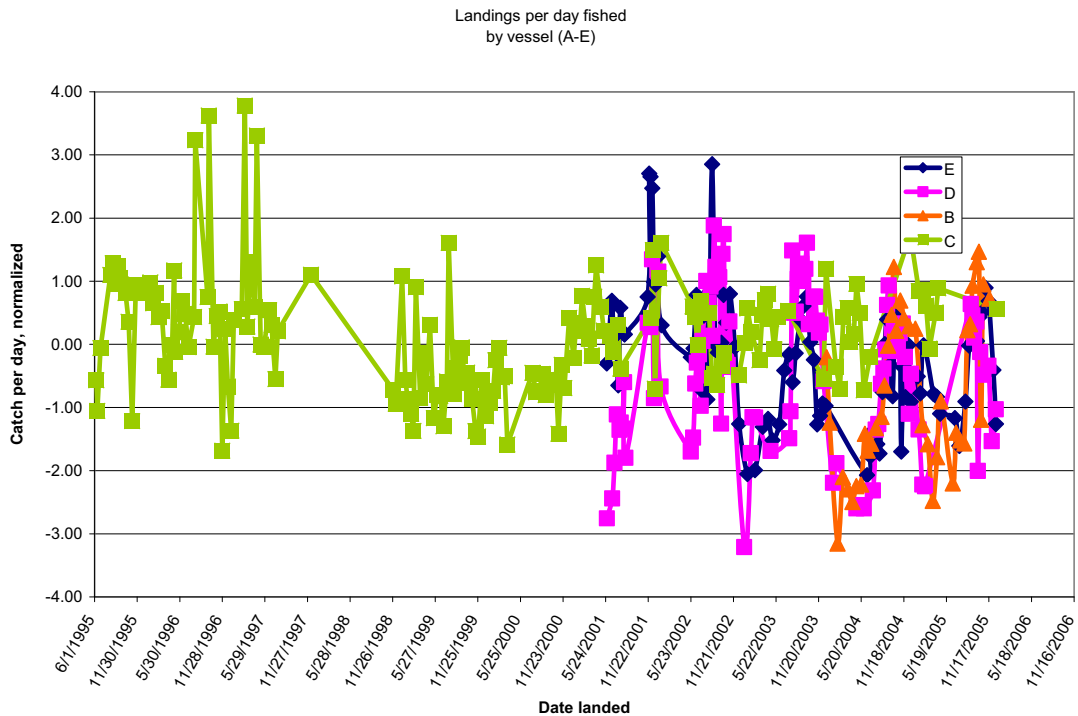


Figure D4.4 Trend in catch per day at sea for vessel trip reports from four limited access vessels recently targeting red crab. The data were normalized using each vessel's landings per day mean and standard deviation for the time series.

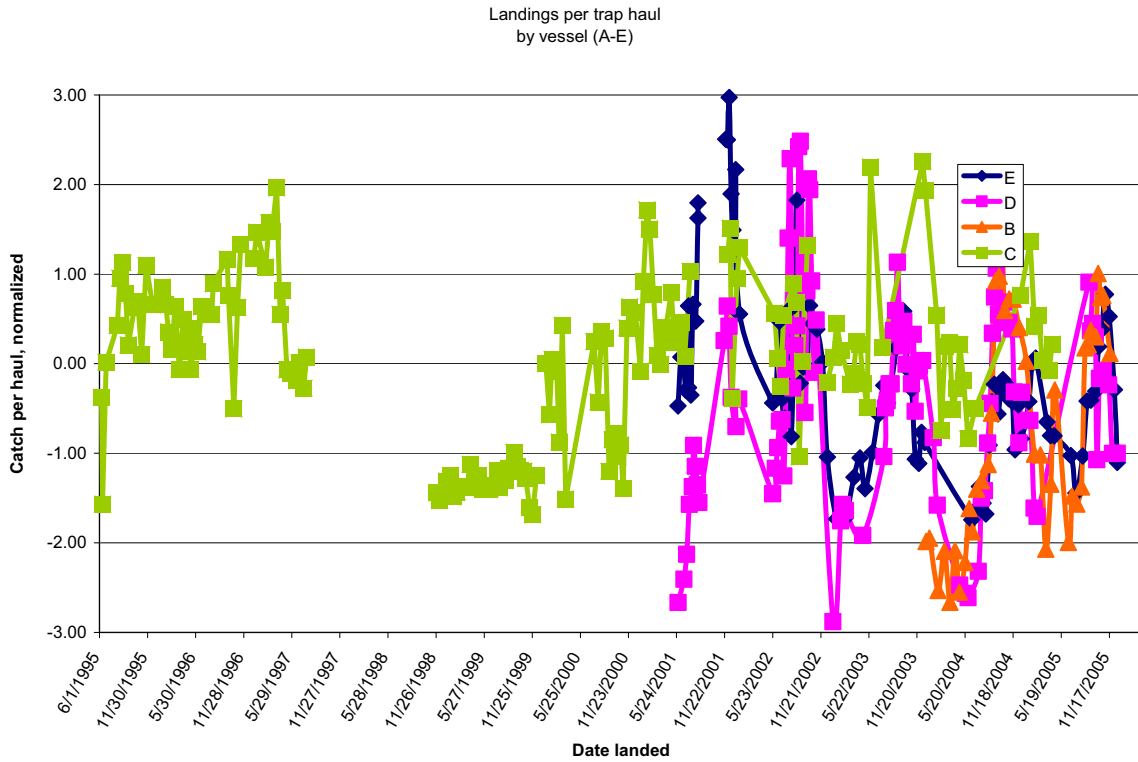


Figure D4.5 Trends in catch per trap haul for vessel trip reports from four limited access vessels targeting red crab. The data were normalized using each mean and standard deviation for the time series.

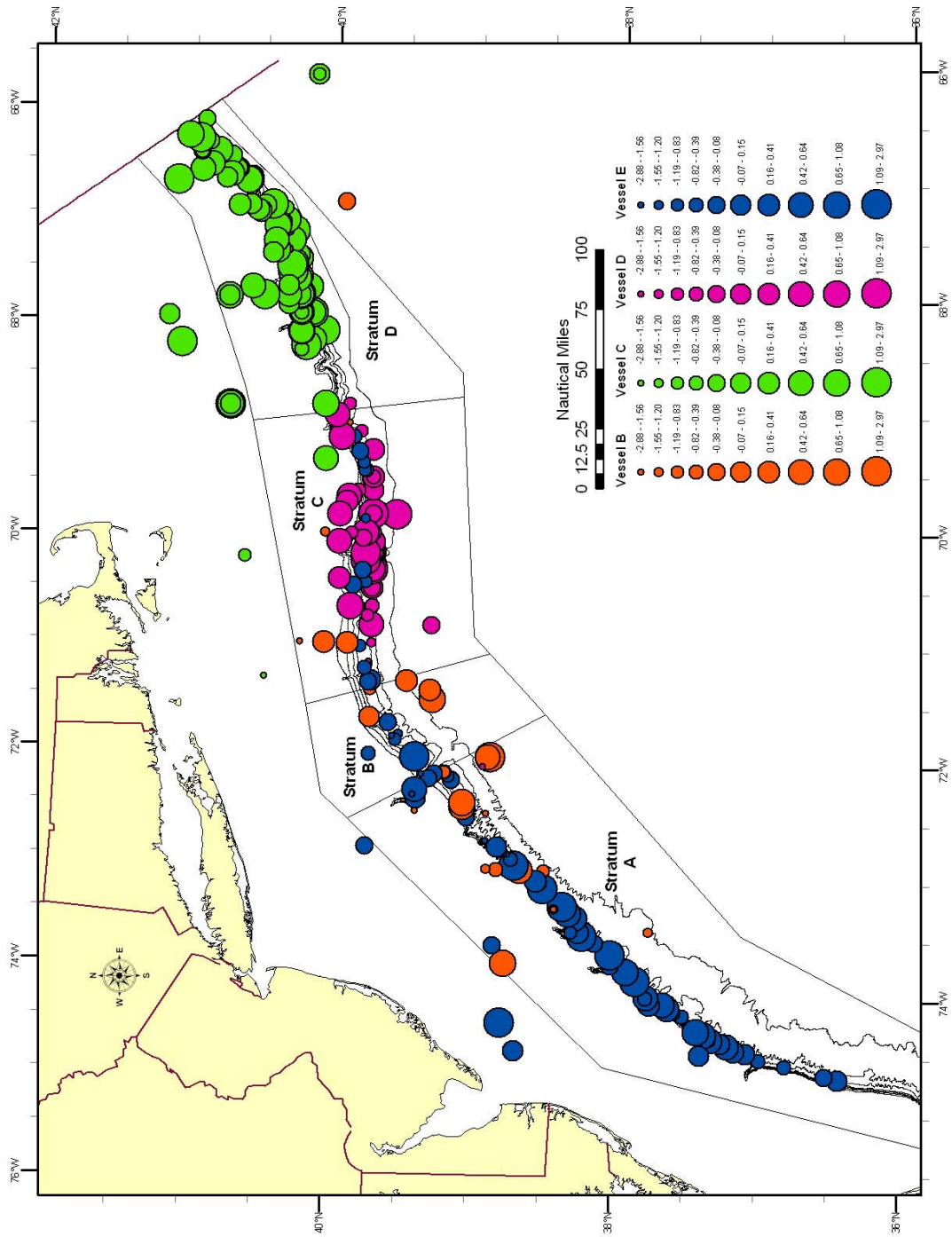


Figure D4.6 Normalized VTR reported landings per trap haul by vessel, 2001-2005. (Outlying catches probably did not occur in that location, but are a result of errors in reporting or transcription of latitude or longitude.)

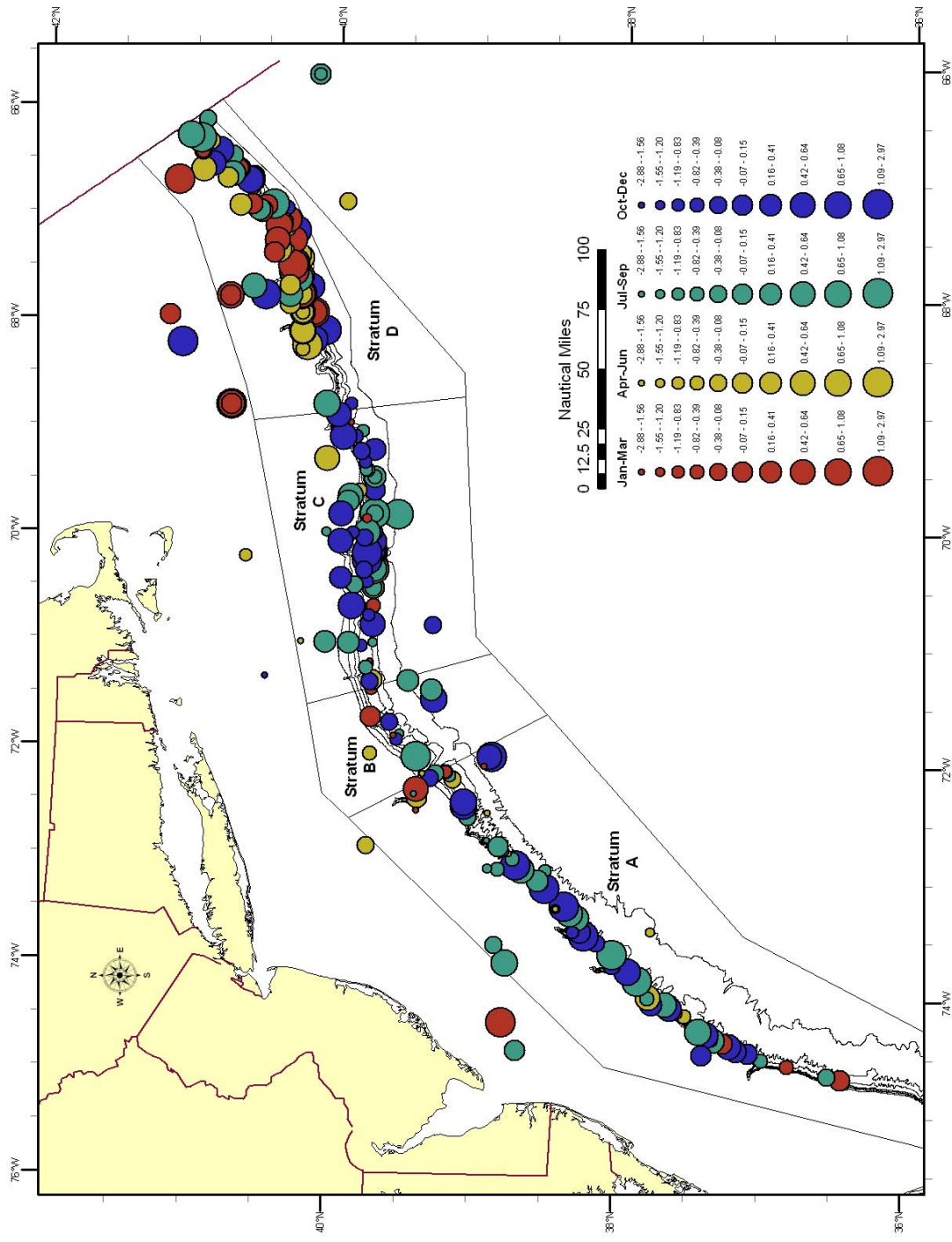


Figure D4.7 Normalized VTR reported landings per trap haul by quarter, 2001-2005. (Outlying catches probably did not occur in that location, but are a result of errors in reporting or transcription of latitude or longitude.)

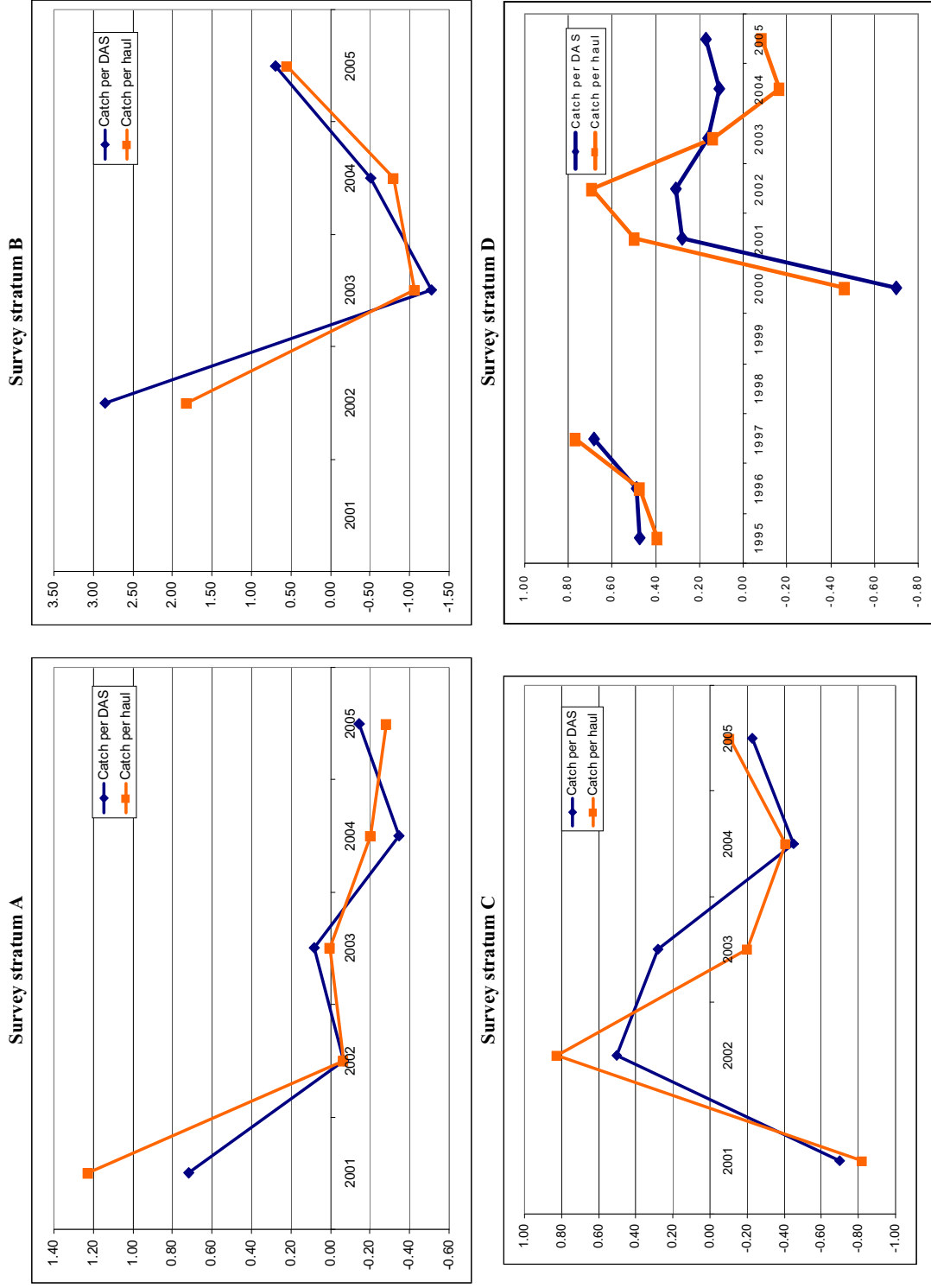


Figure D4.8 Trends in normalized landings per day and per trap haul by stratum.

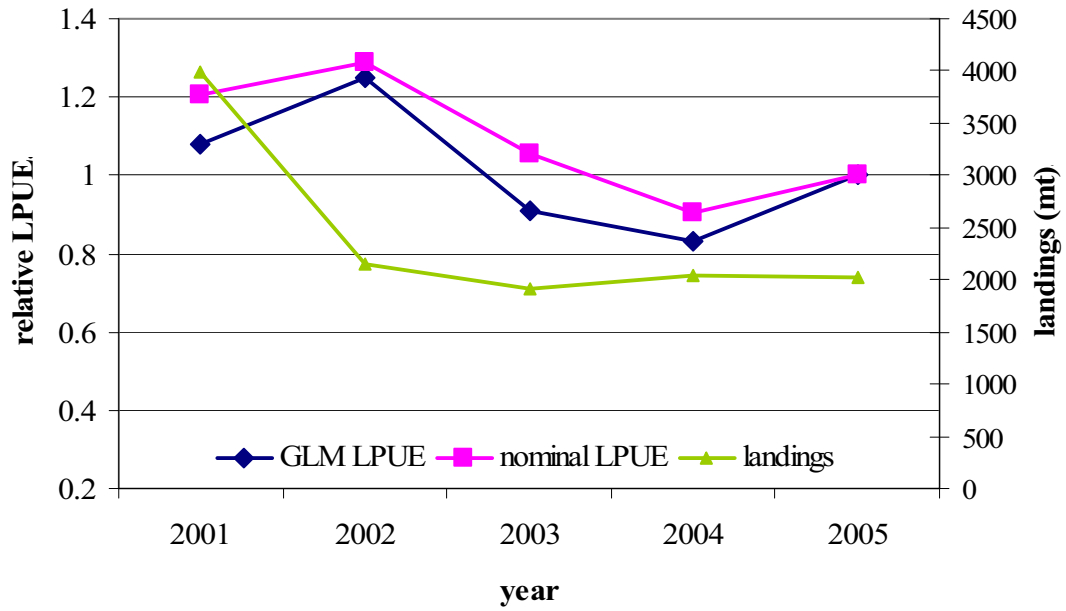


Figure D4.9 Standardized LPUE, nominal LPUE and reported red crab landings, 2001-2005.

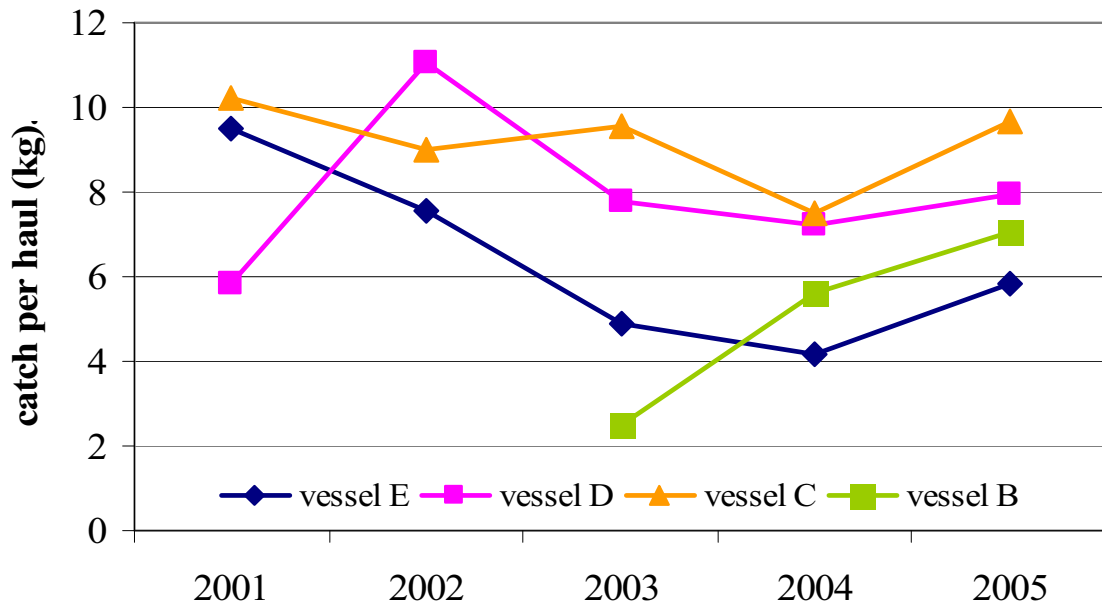


Figure D4.10 Re-transformed standardized LPUE from a GLM model for four vessels.

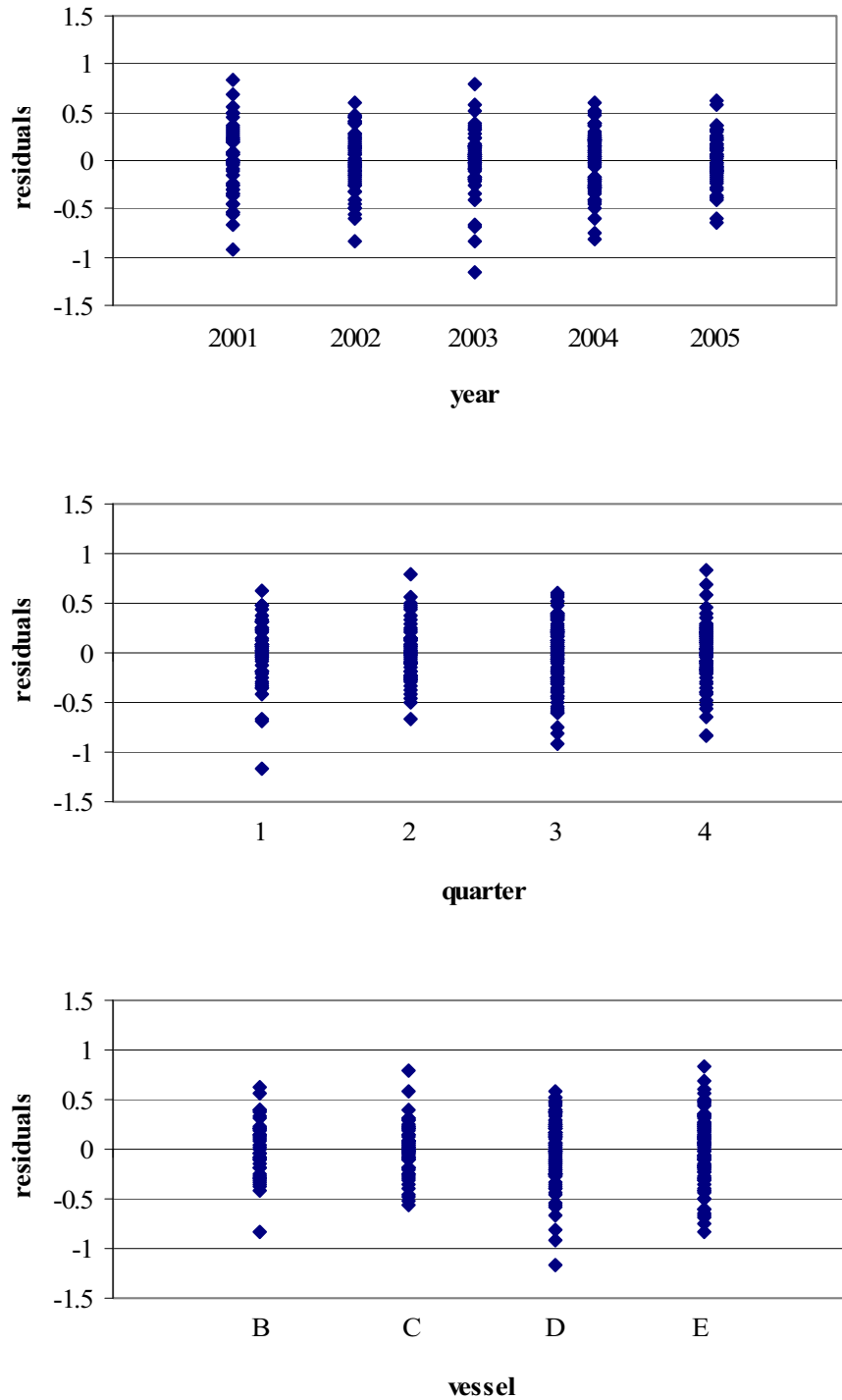


Figure D4.11 Plots of GLM model residuals vs. the three most influential variables.

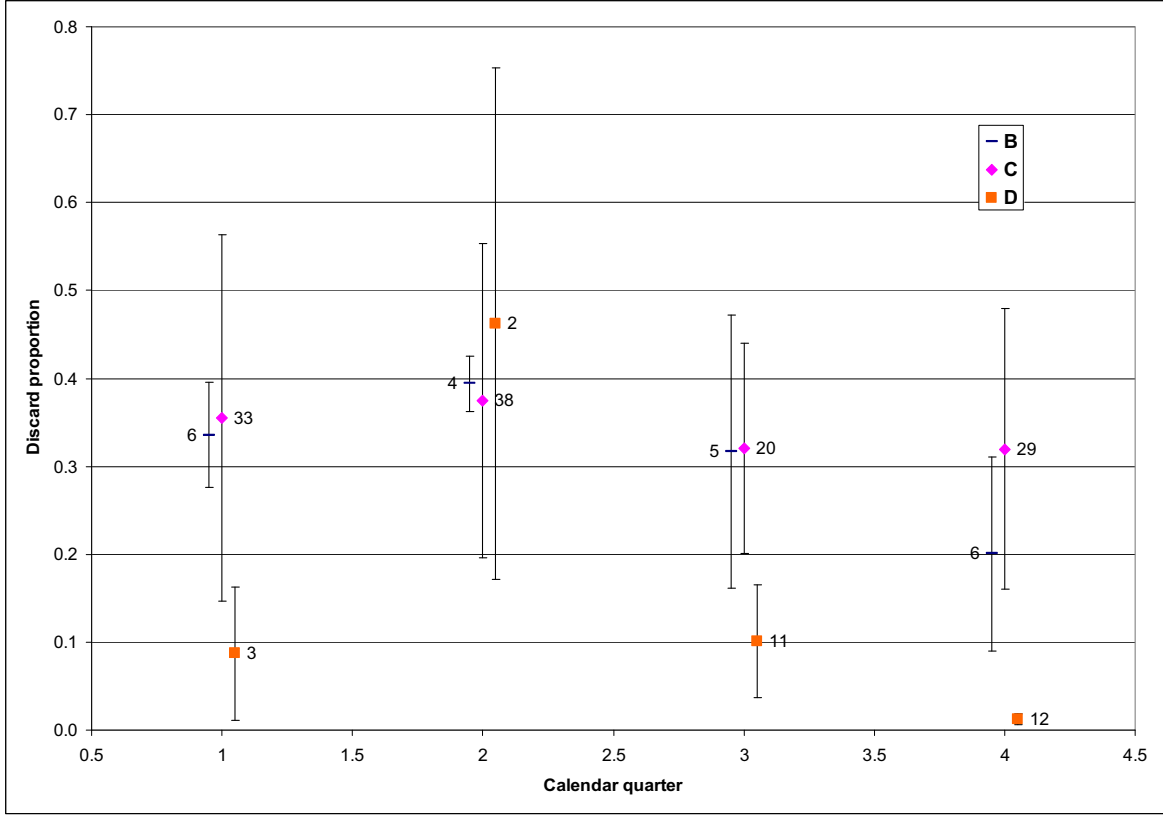


Figure D4.12 VTR reported discards as a fraction of catch by limited access vessels during 2002-2005 by calendar quarter. The mean fraction of the catch discarded is shown, +/- one standard deviation. The number of trips reporting discards is shown next to the mean point.

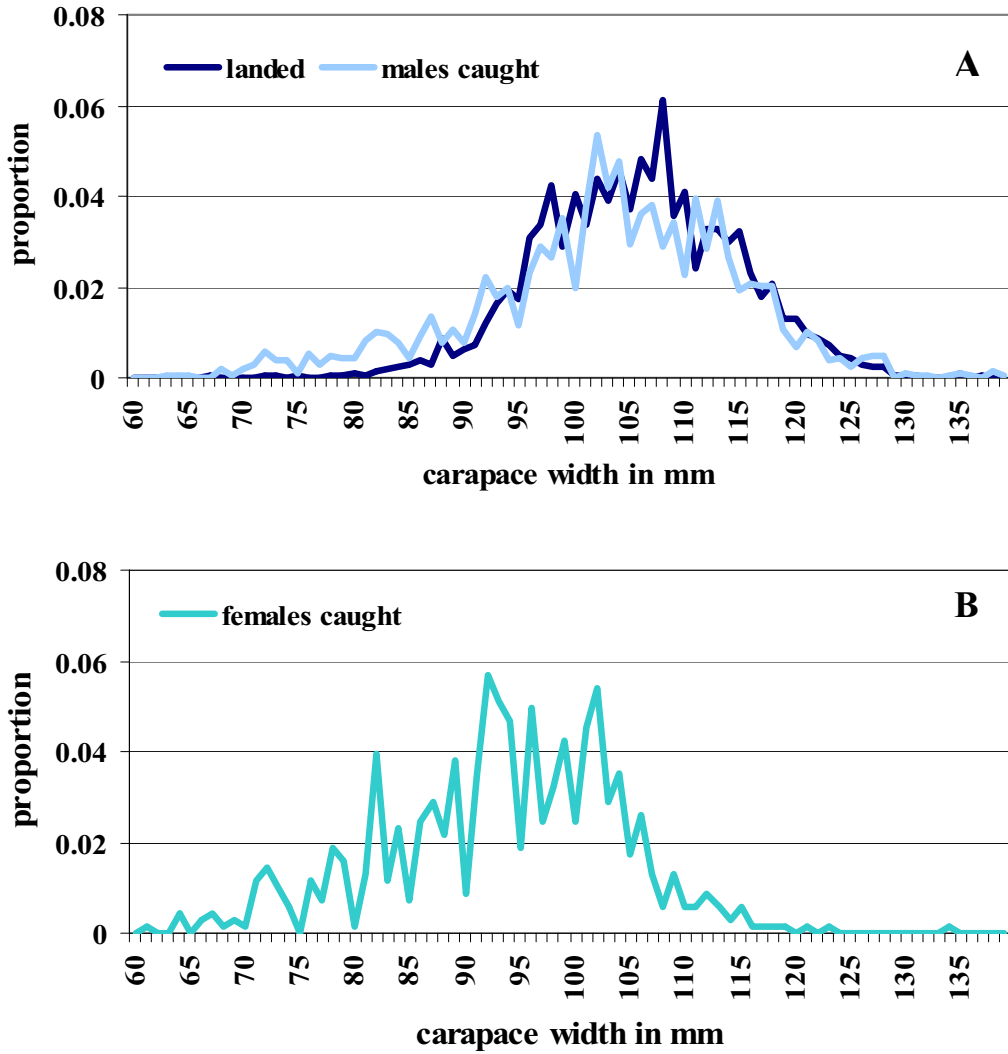
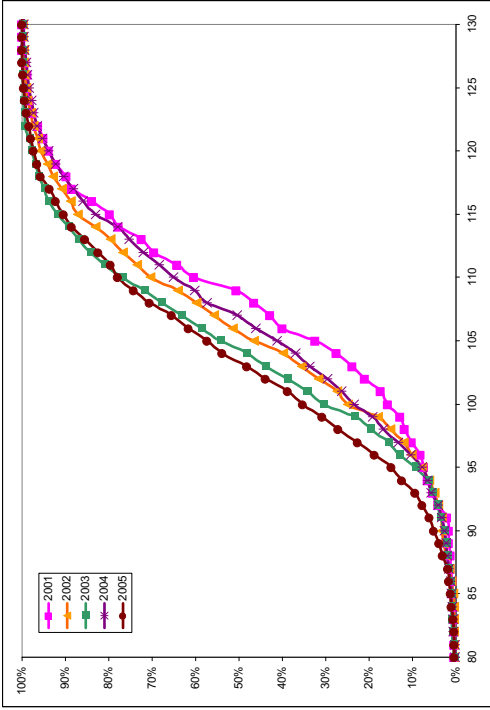
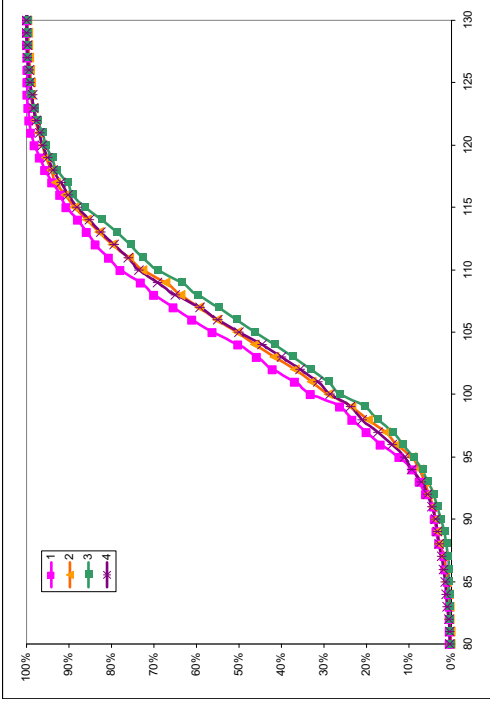


Figure D4.13 (A) Red crab length composition data from port samples (only males are landed) and sea samples (males only). (B) Length composition data from sea samples, females only. All crabs were caught during 2004-2005 in survey strata A, C and D over a range of seasons.

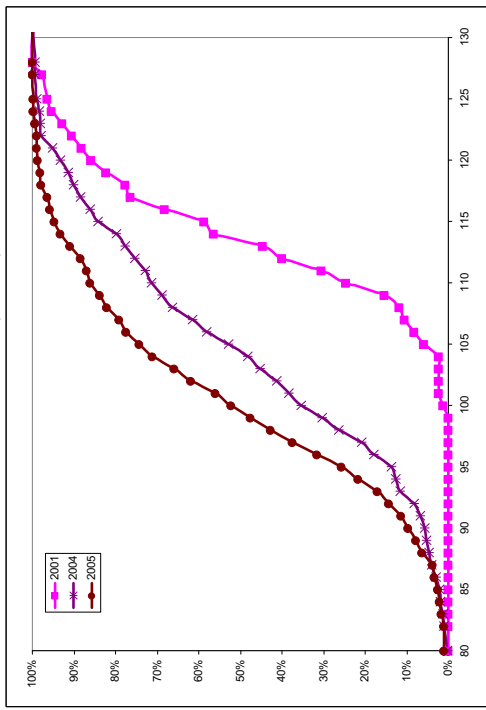
**Size frequency by year, 2001-2005
All areas combined**



**Size frequency by calendar quarter
All areas combined**



**Mid-Atlantic Region
Statistical areas 533, 616, 622 and 627**



**Georges Bank Region
Statistical areas 525, 526, 537, and 562**

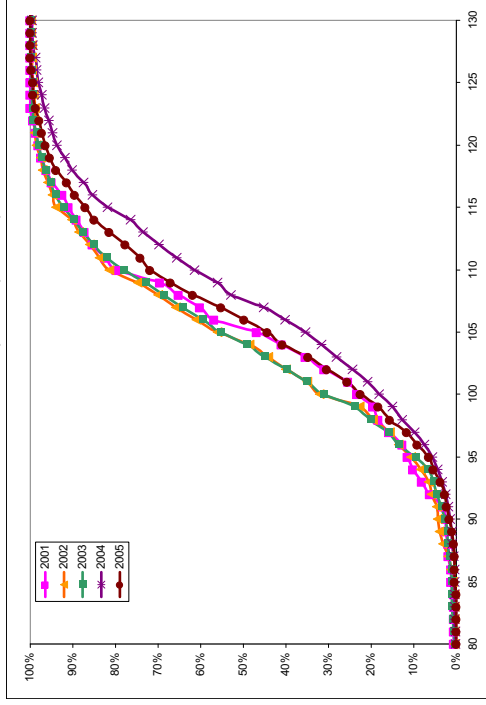
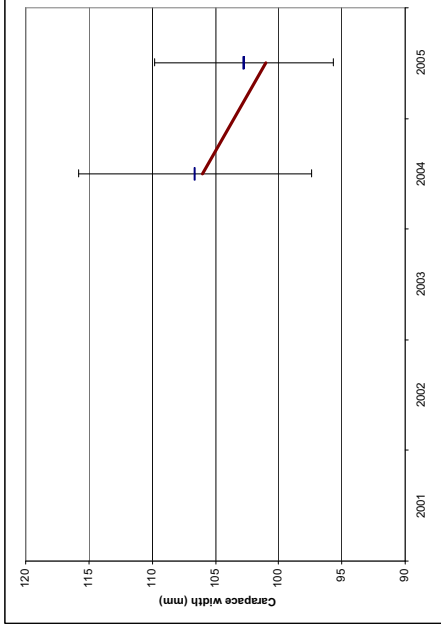
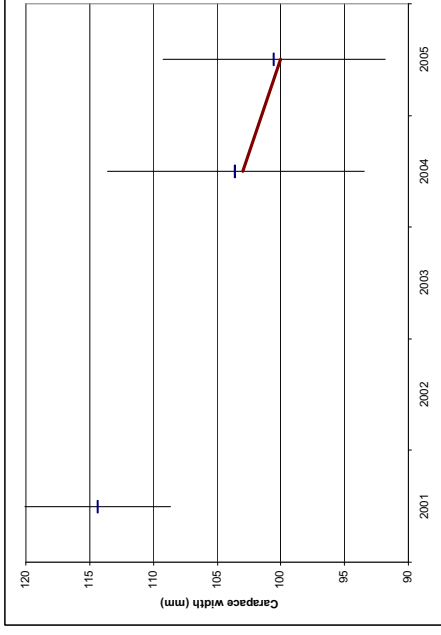


Figure D4.14 Cumulative red crab size frequency for all areas, 2001-2005. Carapace width is measured in mm.

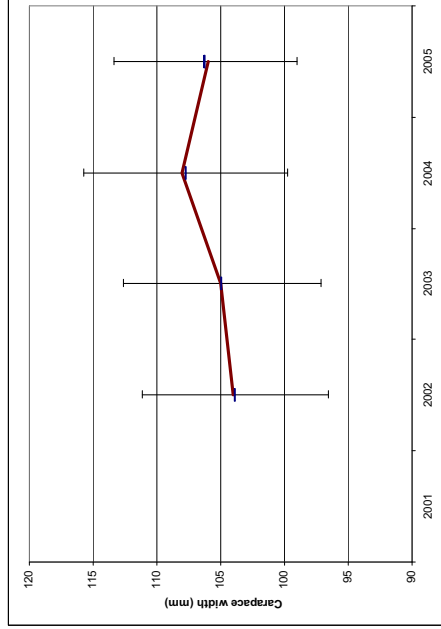
Survey stratum A
Statistical areas 622 and 627



Survey stratum B
Statistical areas 533 and 616



Survey stratum C
Statistical areas 526 and 537



Survey stratum D
Statistical areas 525 and 562

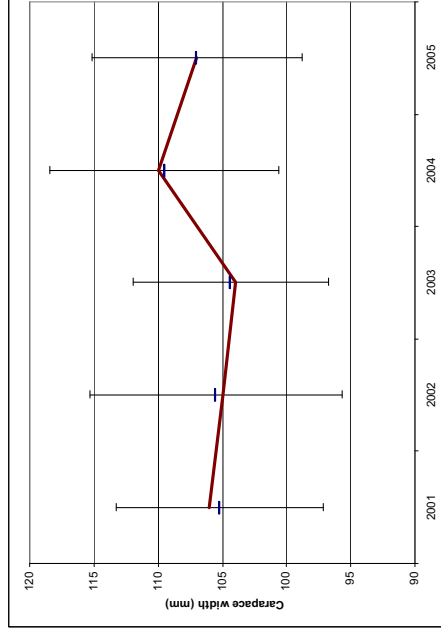


Figure D4.15 Mean (horizontal line, +/- 1 standard deviation) and median carapace width (at hatch mark) for red crabs measured by port agents from commercial catches during 2001-2005 by year and survey stratum.

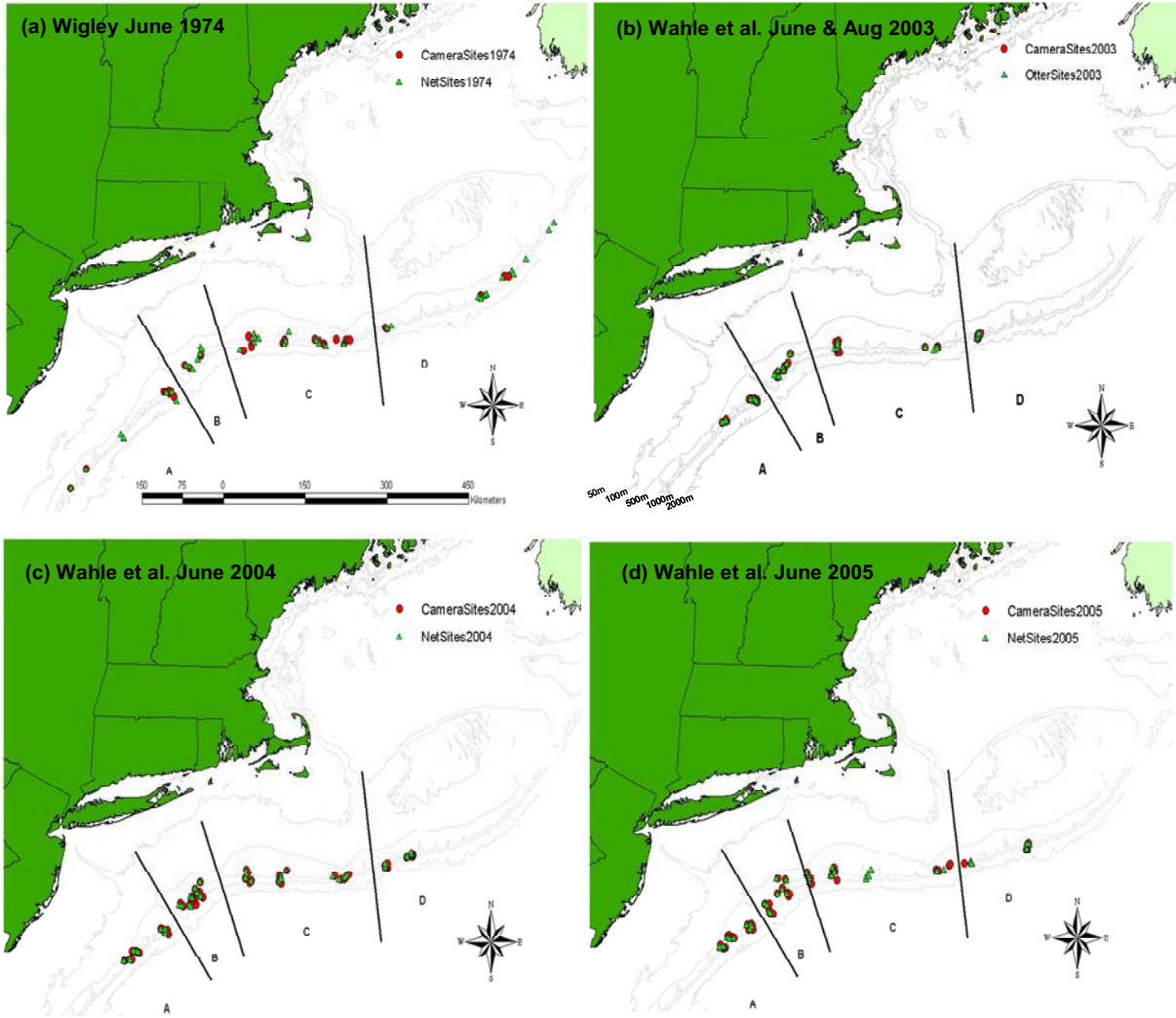


Figure D5.1 Locations of net and camera tows during the (a) camera/trawl surveys conducted in 1974 and (b-d) the camera/trawl surveys conducted in 2003-2005.

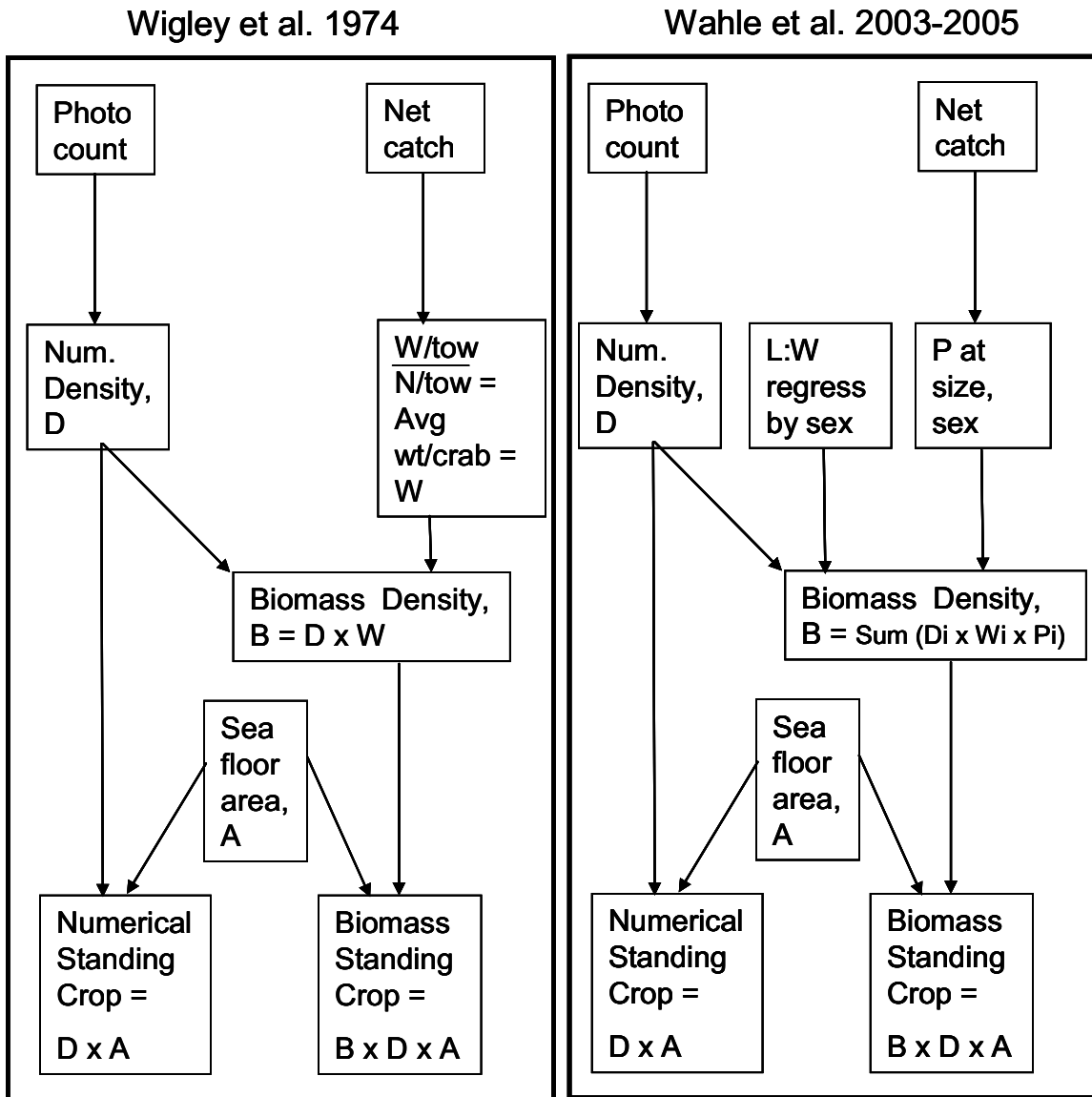


Figure D5.2 Comparative overview of the 1974 and 2003-05 camera and net survey methods to estimate standing crop.

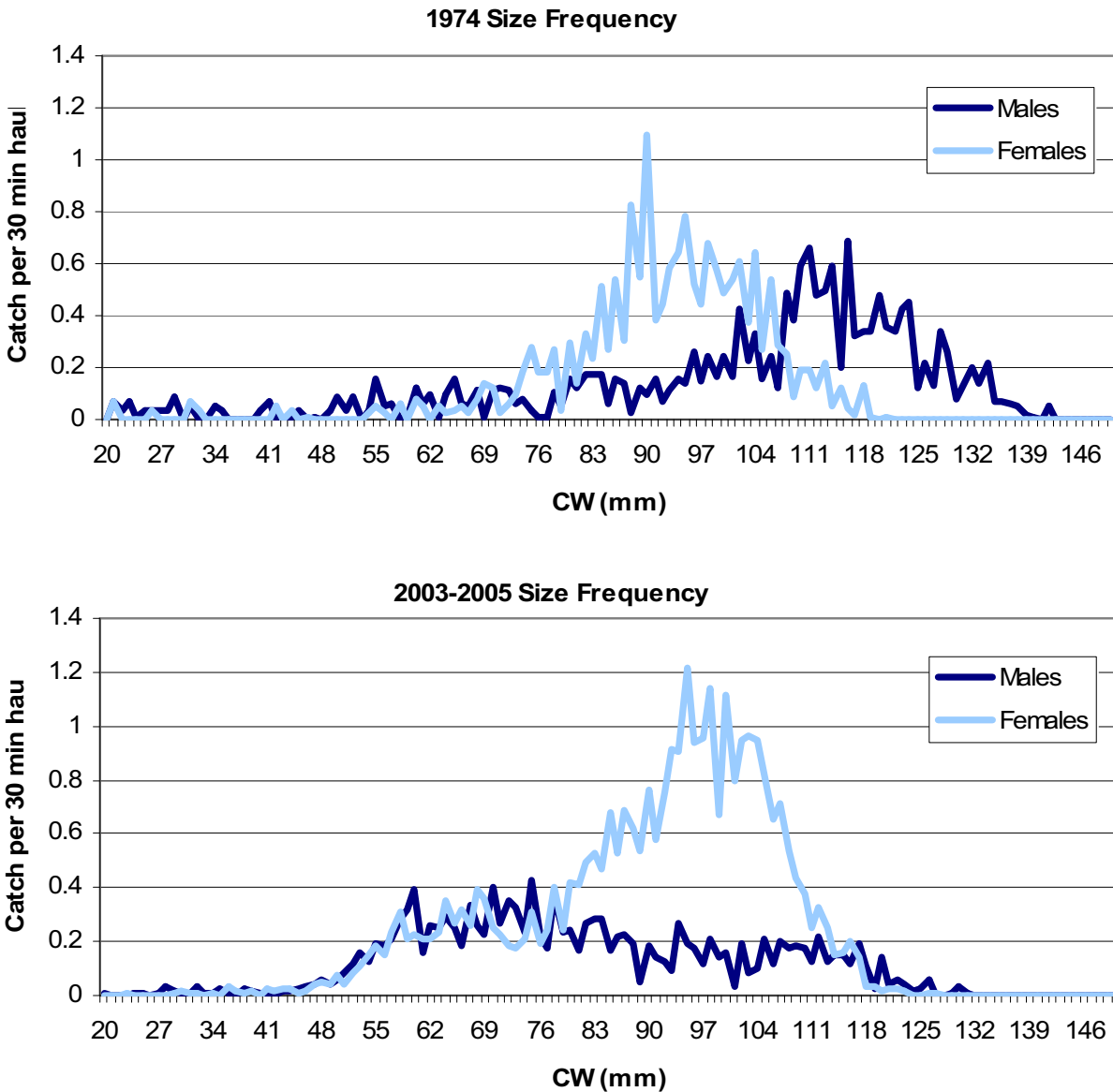


Figure D5.3 Red crab size and sex composition in the 1974 and 2003-2005 otter trawl samples during camera/trawl surveys standardized to catch-per-30-minute-tow, tows from all depths and sectors combined. Vertical line indicates “commercial” size as defined in Wigley et al. (1975): crabs ≥ 114 mm carapace width. The 1974 size distribution is represented by 641 male and 795 female crabs; the 2003-2005 distribution, 2209 male and 4602 female crabs. Complete size-sex composition by depth and sector is tabulated in Appendix D3.

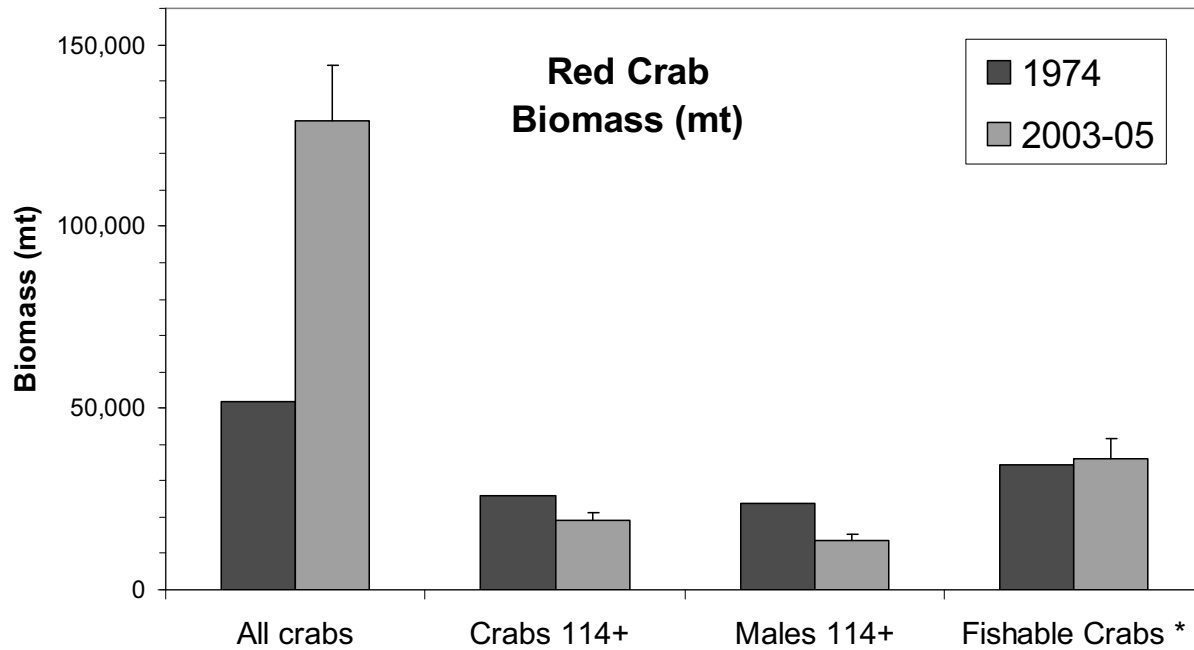


Figure D5.4 Red crab standing biomass (mt) estimates for 1974 and the mean (+1SE) of four surveys conducted between 2003 and 2005. Estimates for 2003-2005 represent the mean (+1SE) of four surveys conducted over that period. No error term is available for the 1974 estimates. * Biomass of fishable crabs determined from fishery selectivity analysis (section 7.1).

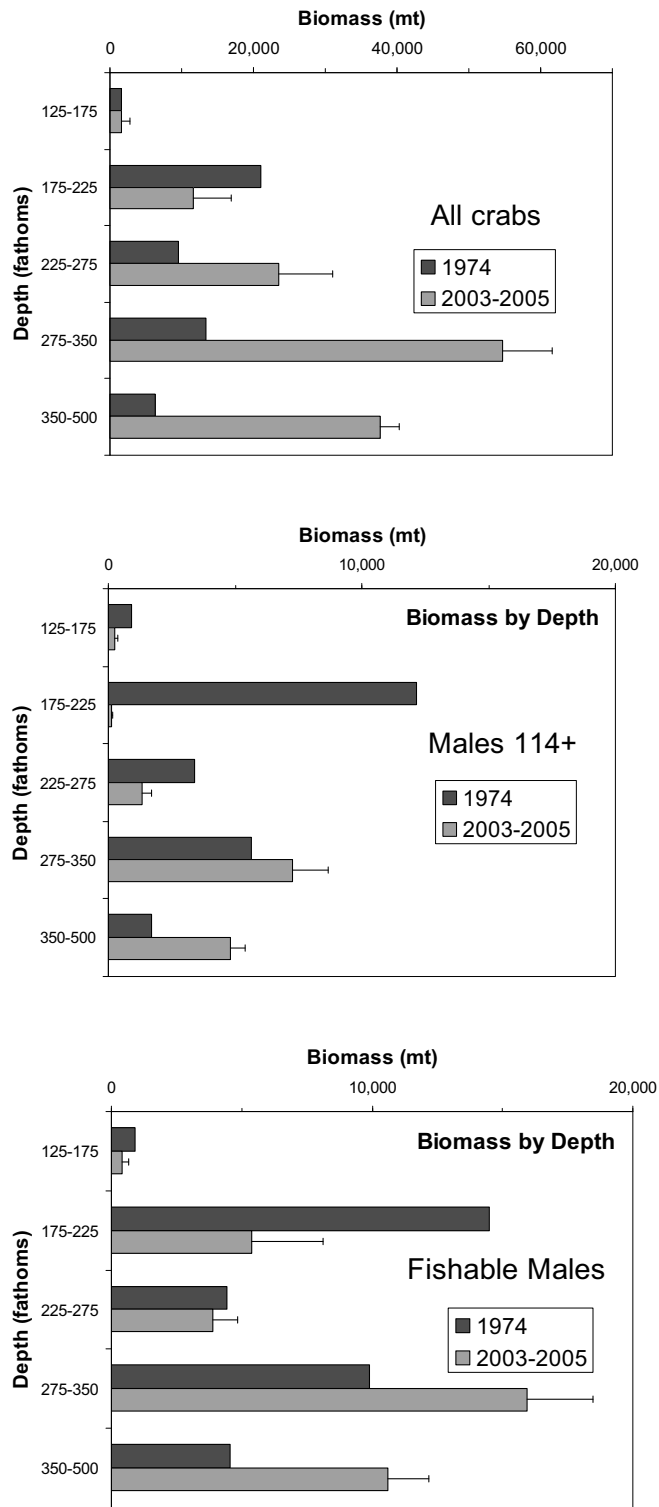


Figure D5.5. Red crab biomass by depth in 1974 and 2003-2005. All crabs (top), males 114+ mm (middle), and currently fishable males (bottom). Estimates for 2003-2005 represent the mean (+1SE) of four surveys conducted over that period. No error term is available for the 1974 estimates.

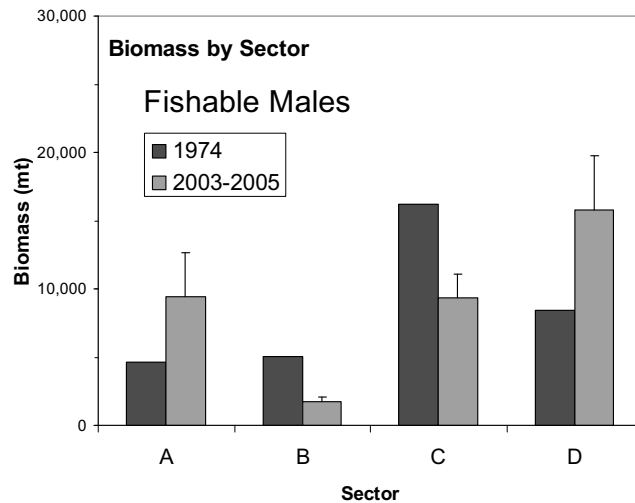
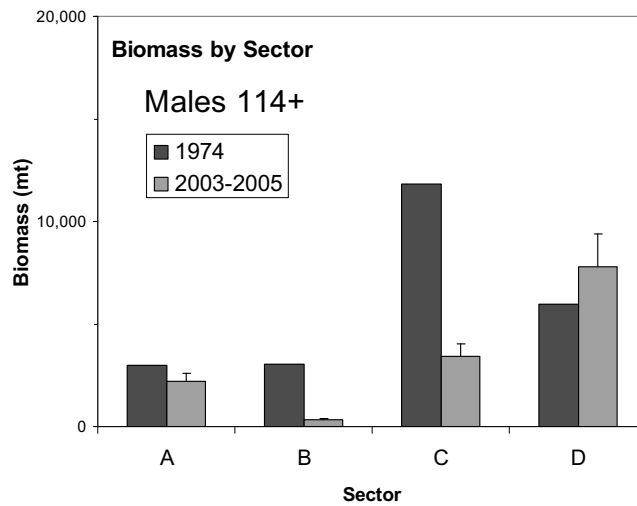
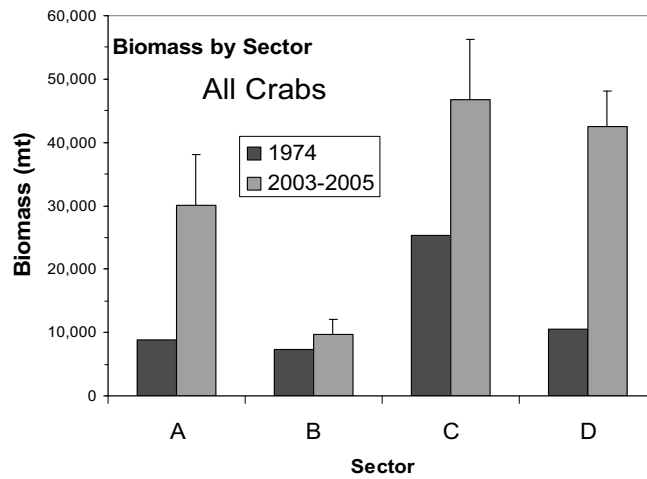


Figure D 5.6. Red crab biomass by sector in 1974 and 2003-2005. All crabs (top), males over 114+ mm (middle), and currently fishable males (bottom). Estimates for 2003-2005 represent the mean (+1 SE) of four surveys conducted over that period. No error term is available for the 1974 estimates.

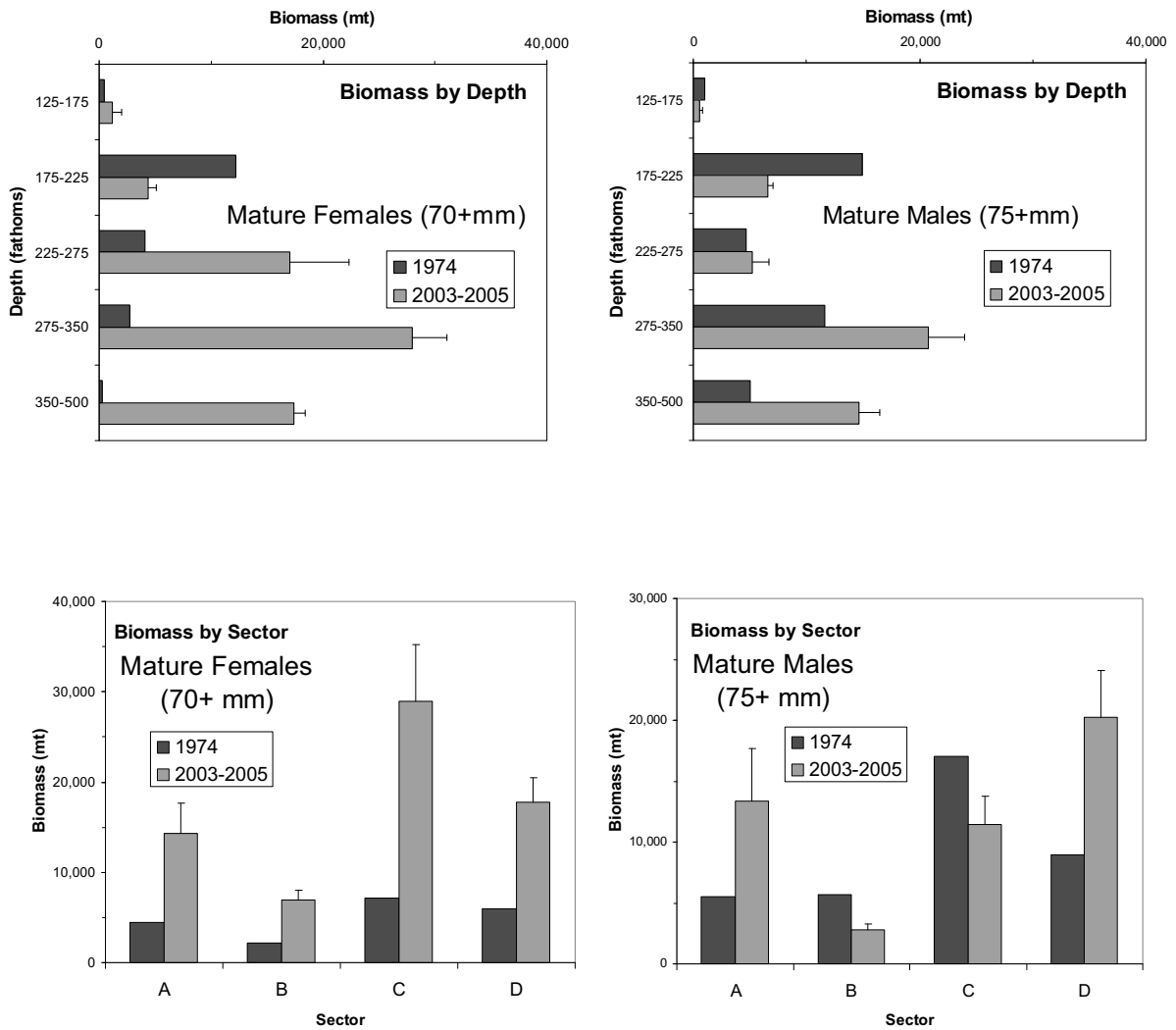


Figure D5.7. Biomass estimates of reproductive males (75+ mm) and females (70+ mm) in 1974 and 2003-2005 by depth stratum and geographic sector. Estimates for 2003-2005 represent the mean (+1 SE) of four surveys conducted over that period. No error term is available for the 1974 estimates.

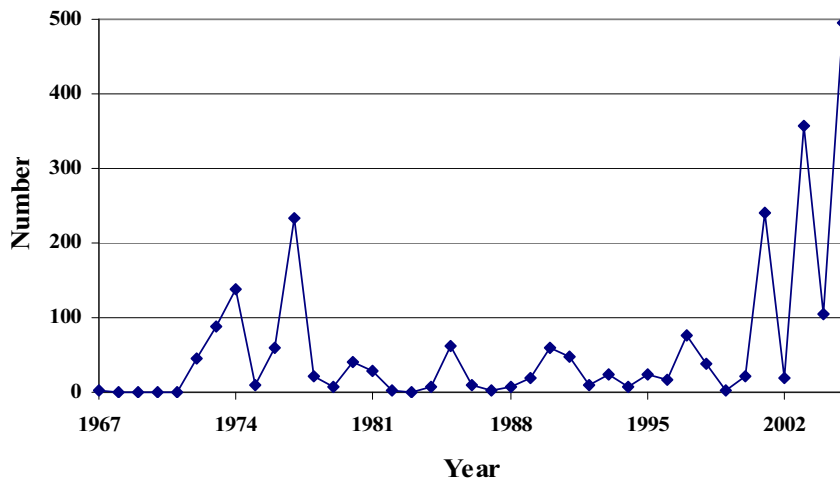


Figure D5.8. Total number of deep sea red crabs caught during the winter, spring, summer and fall NEFSC/NMFS groundfish surveys per year. Not all surveys were conducted every year. A few large tows during recent surveys account for the large numbers in those years.

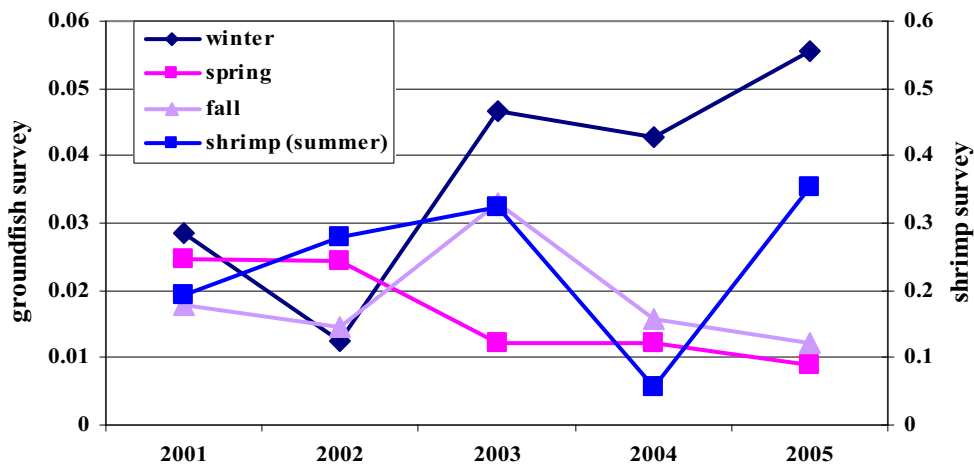


Figure D5.9. Proportion of tows containing red crab in the NEFSC/NMFS groundfish surveys (winter, spring and fall) and the NEFSC/NMFS northern shrimp survey (summer, Gulf of Maine only).

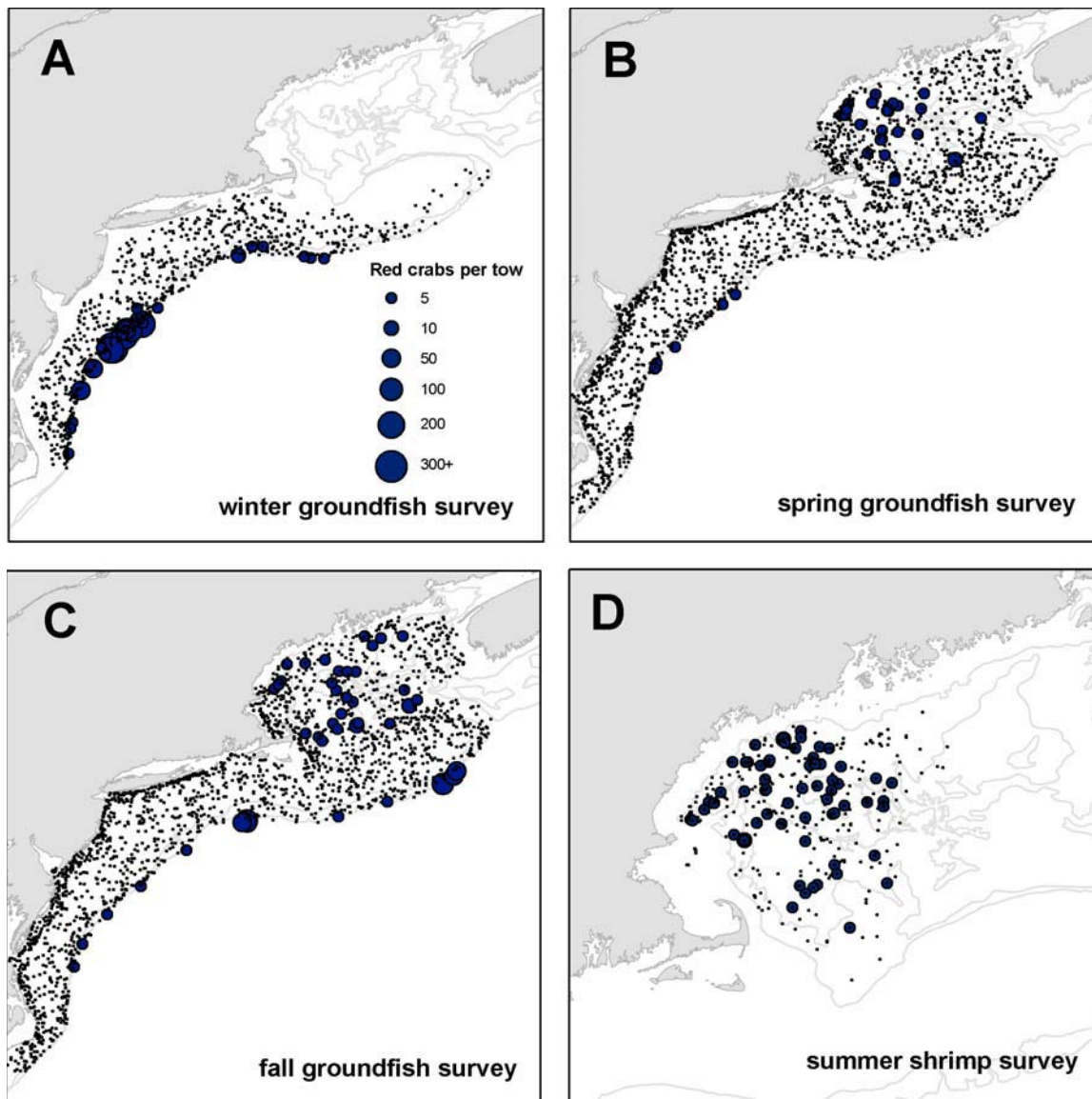


Figure D5.10. Locations of all tows made during the NEFSC/NMFS winter (A), spring (B) and fall (C) groundfish surveys and summer northern shrimp survey (D), 2000-2005. All catches of red crab during this time period are shown in larger symbols.

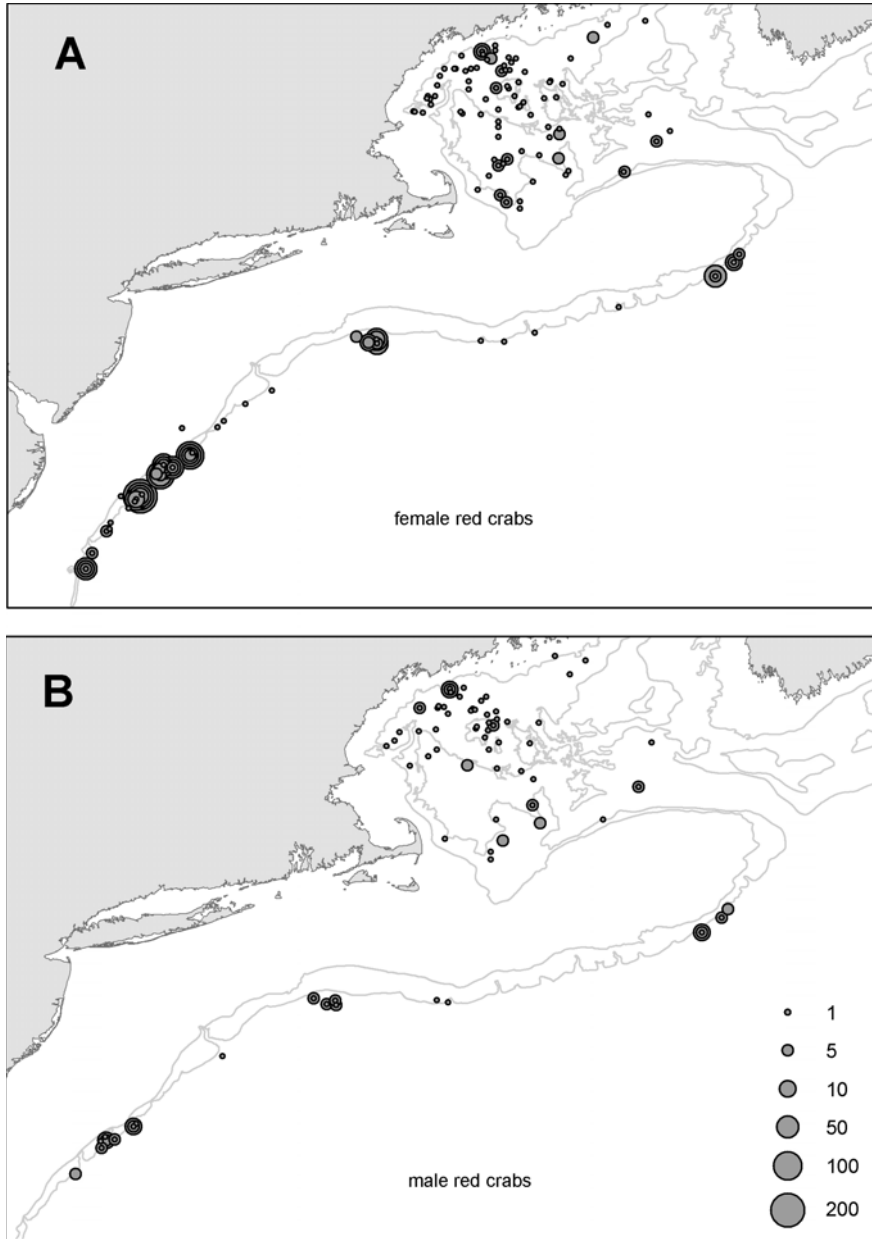


Figure D5.11. All female (A) and male (B) red crab catches from the NEFSC/NMFS winter, spring and fall groundfish and northern shrimp surveys combined, 2000-2005.

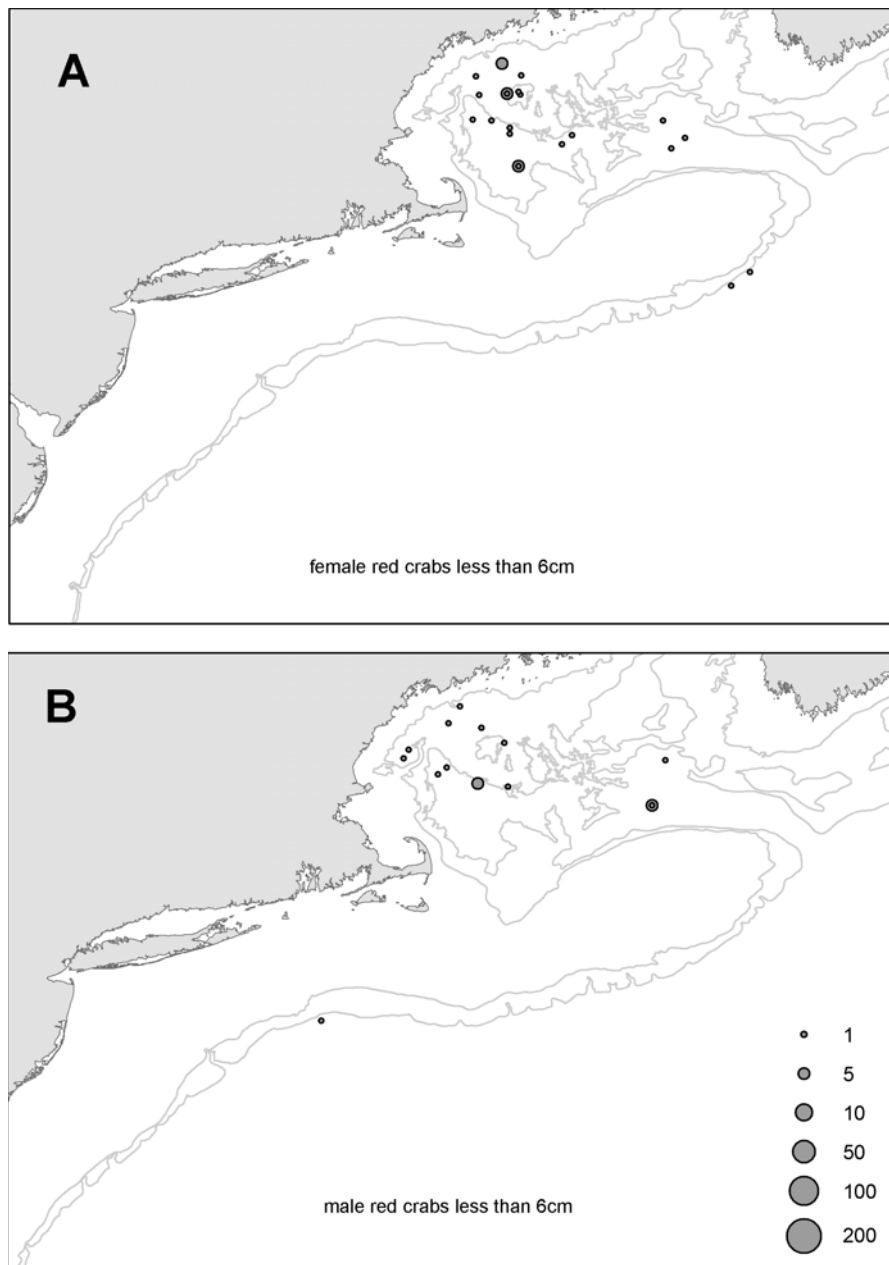


Figure D5.12. All female (A) and male (B) red crabs under 6cm carapace width (most assumed to be immature) caught during the NEFSC/NMFS winter, spring and fall groundfish and northern shrimp surveys combined, 2000-2005.

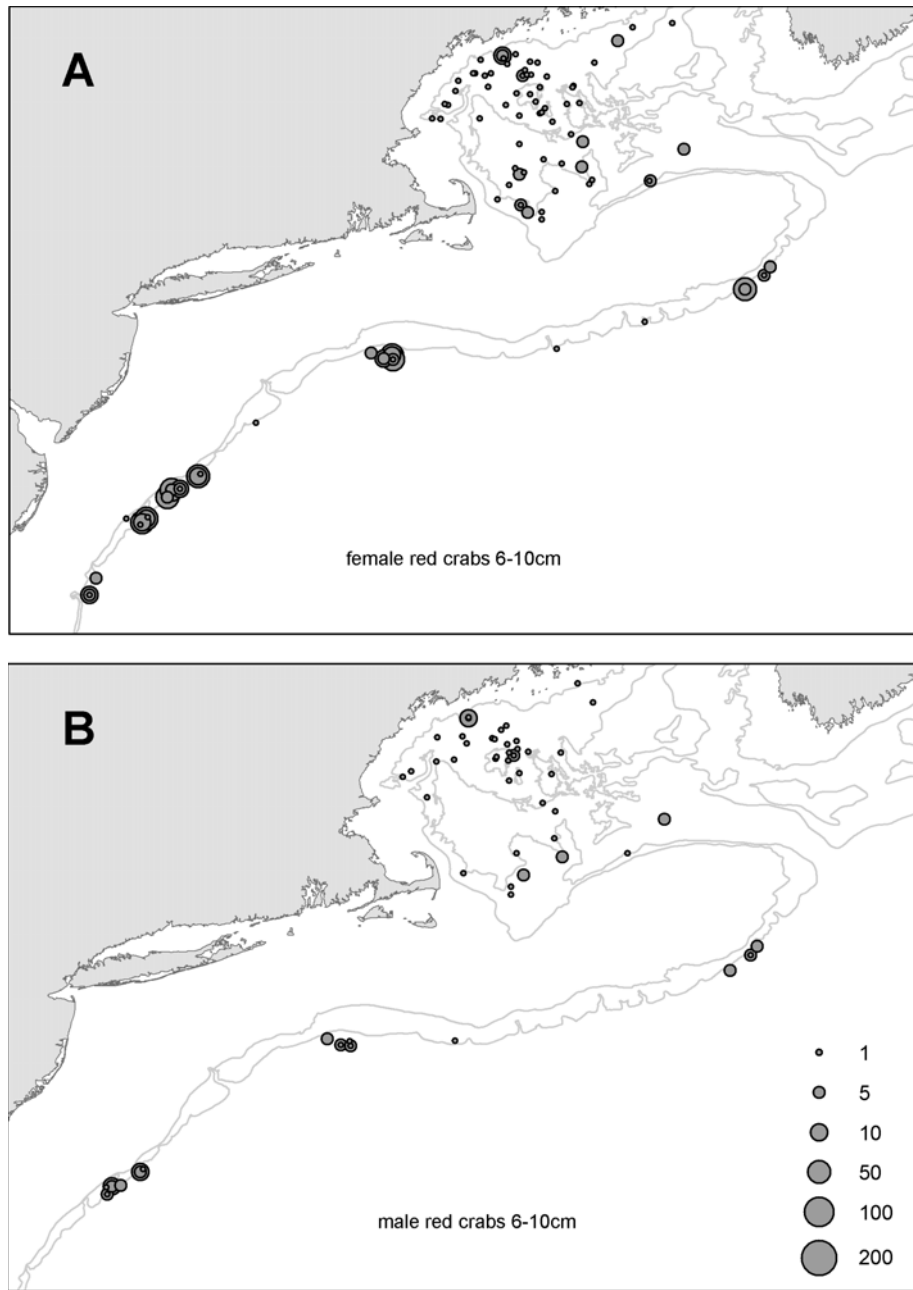


Figure D5.13. (A-B). All female (A) and male (B) red crabs 6-10cm carapace width caught during the NEFSC/NMFS winter, spring and fall groundfish and northern shrimp surveys combined, 2000-2005.

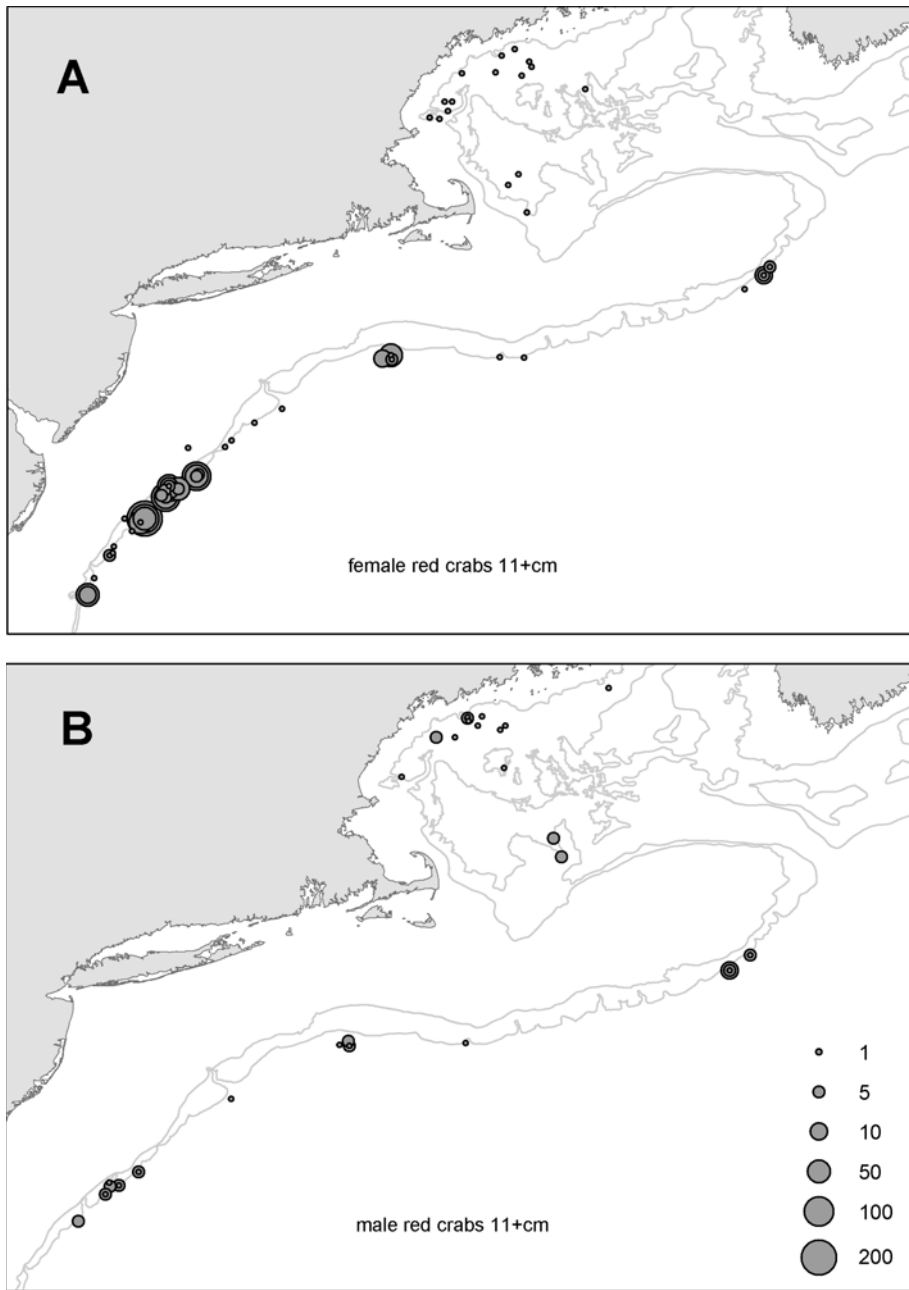


Figure D5.14. All female (A) and male (B) red crabs over 10cm carapace width (marketable size) caught during the NEFSC/NMFS winter, spring and fall groundfish and northern shrimp surveys combined, 2000-2005.

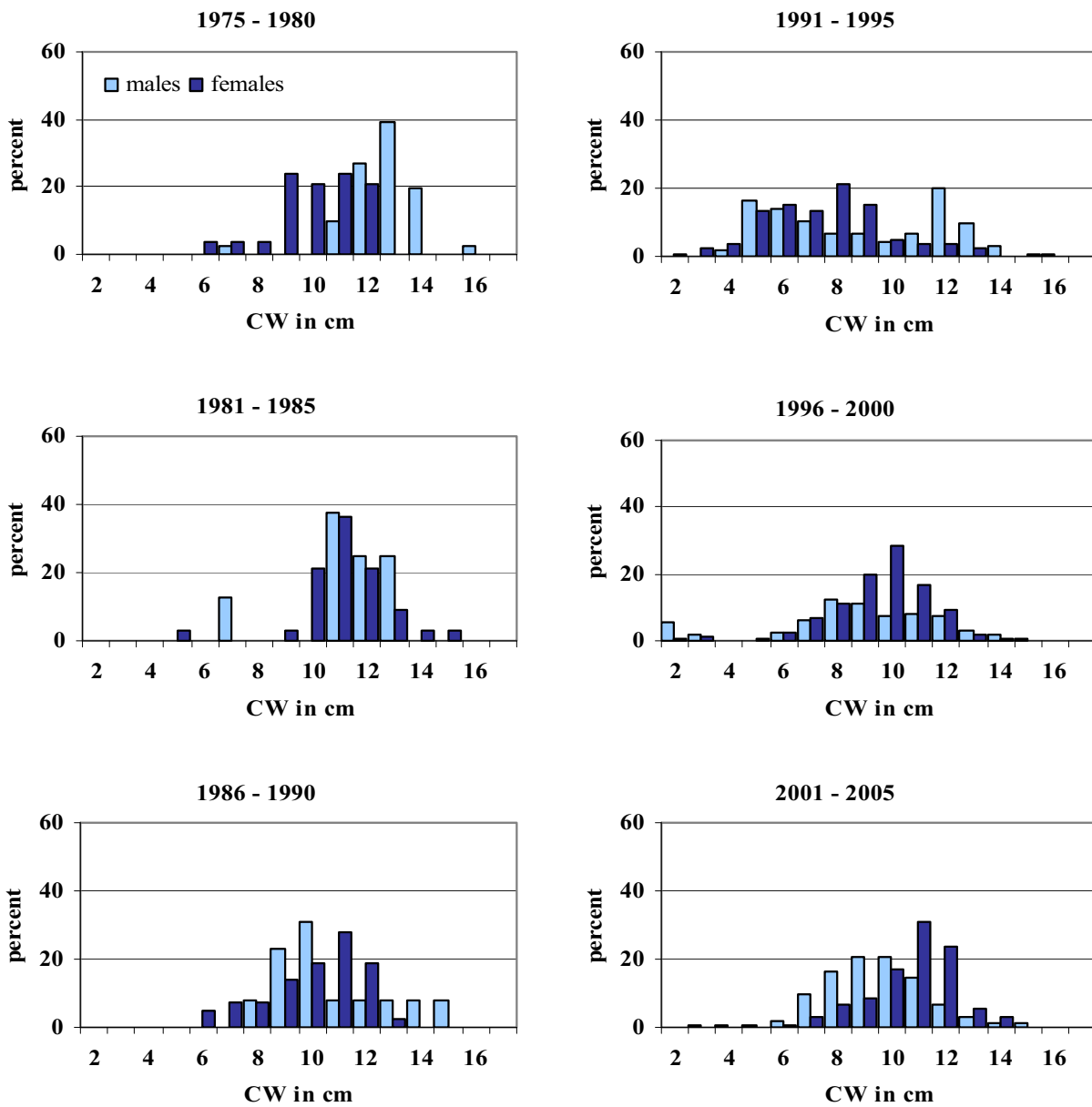


Figure D5.15. Percent at length (carapace width in cm) of all male and female red crabs caught and measured in any NEFSC/NMFS survey in 5-year bins from 1975 to 2005.

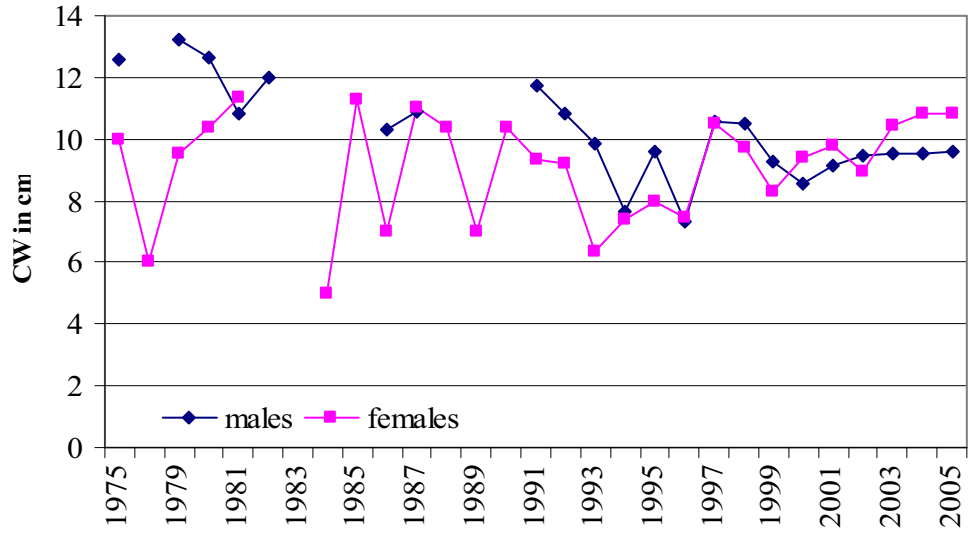


Figure D5.16. Mean male and female red crab carapace width, all NEFSC/NMFS surveys where crabs were measured, by year.

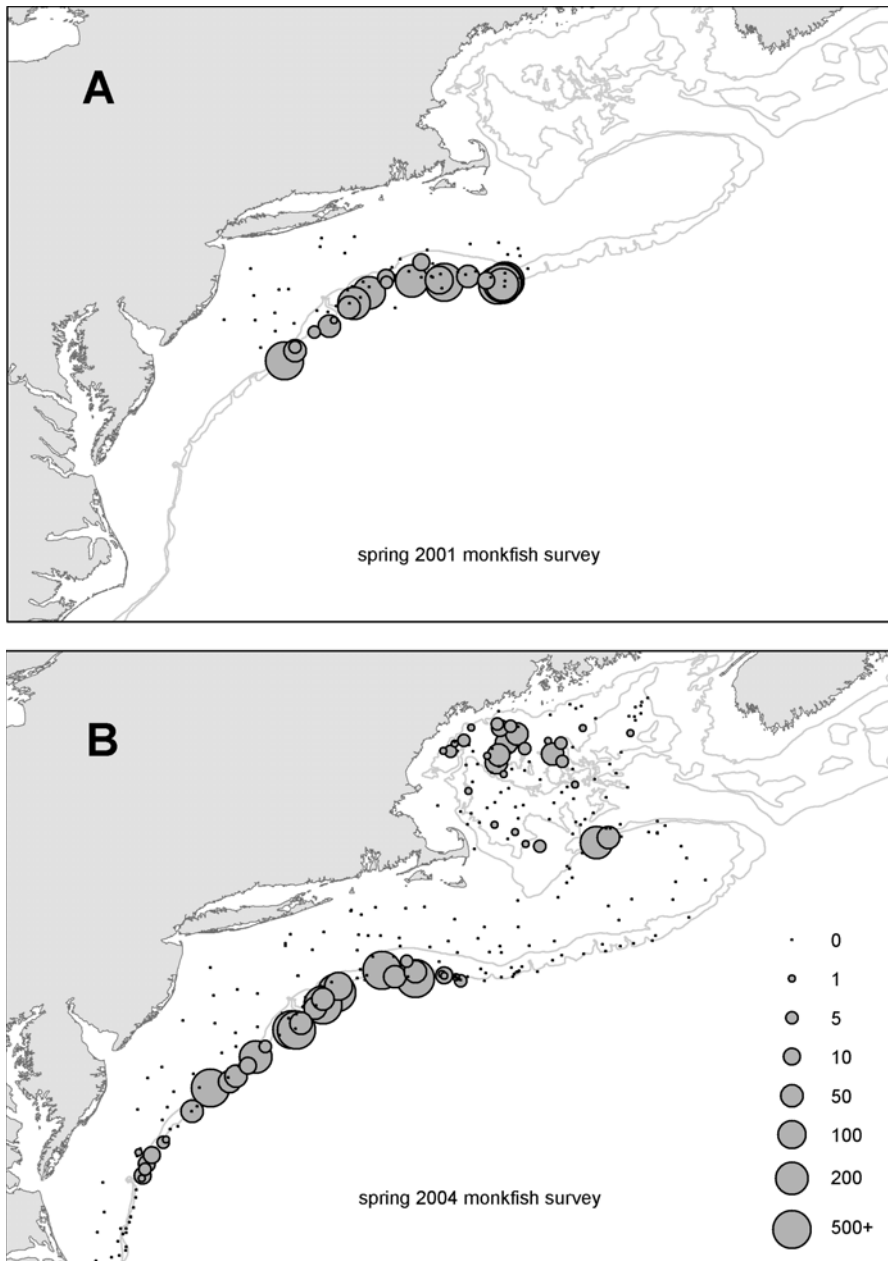


Figure D5.17. All red crab catch data from the NEFSC/NMFS cooperative monkfish surveys conducted in spring/summer 2001 (A) and 2004 (B).

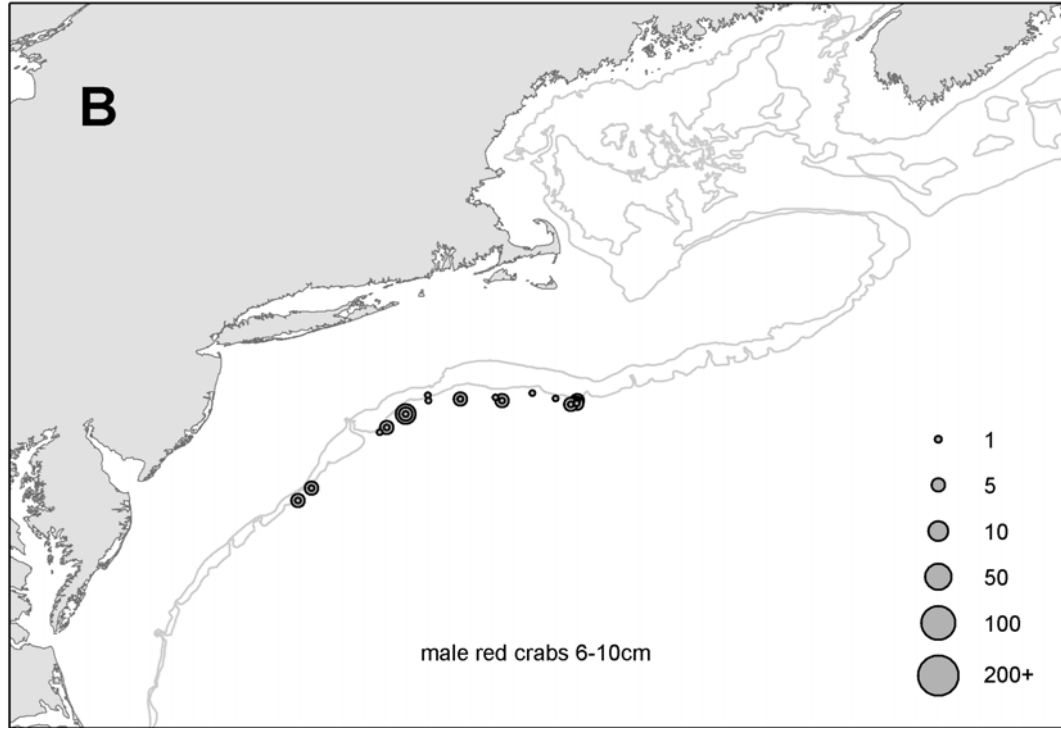
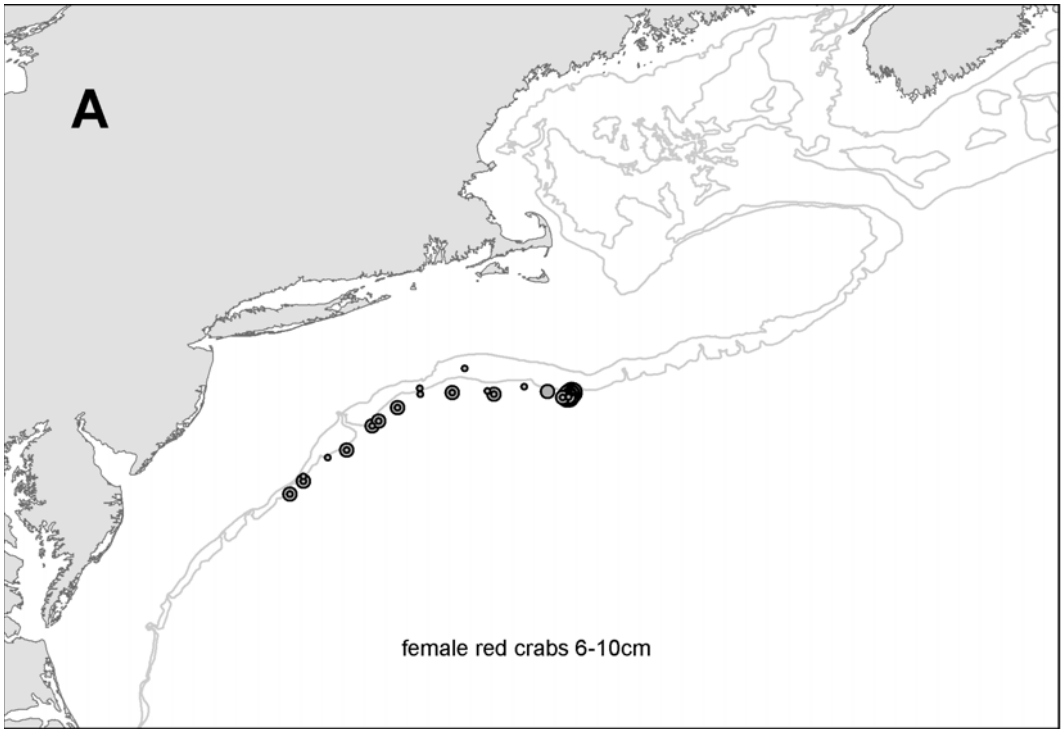


Figure D5.18. All female (A) and all male (B) red crabs 6-10cm in carapace width from the 2001 NEFSC/NMFS cooperative monkfish survey.

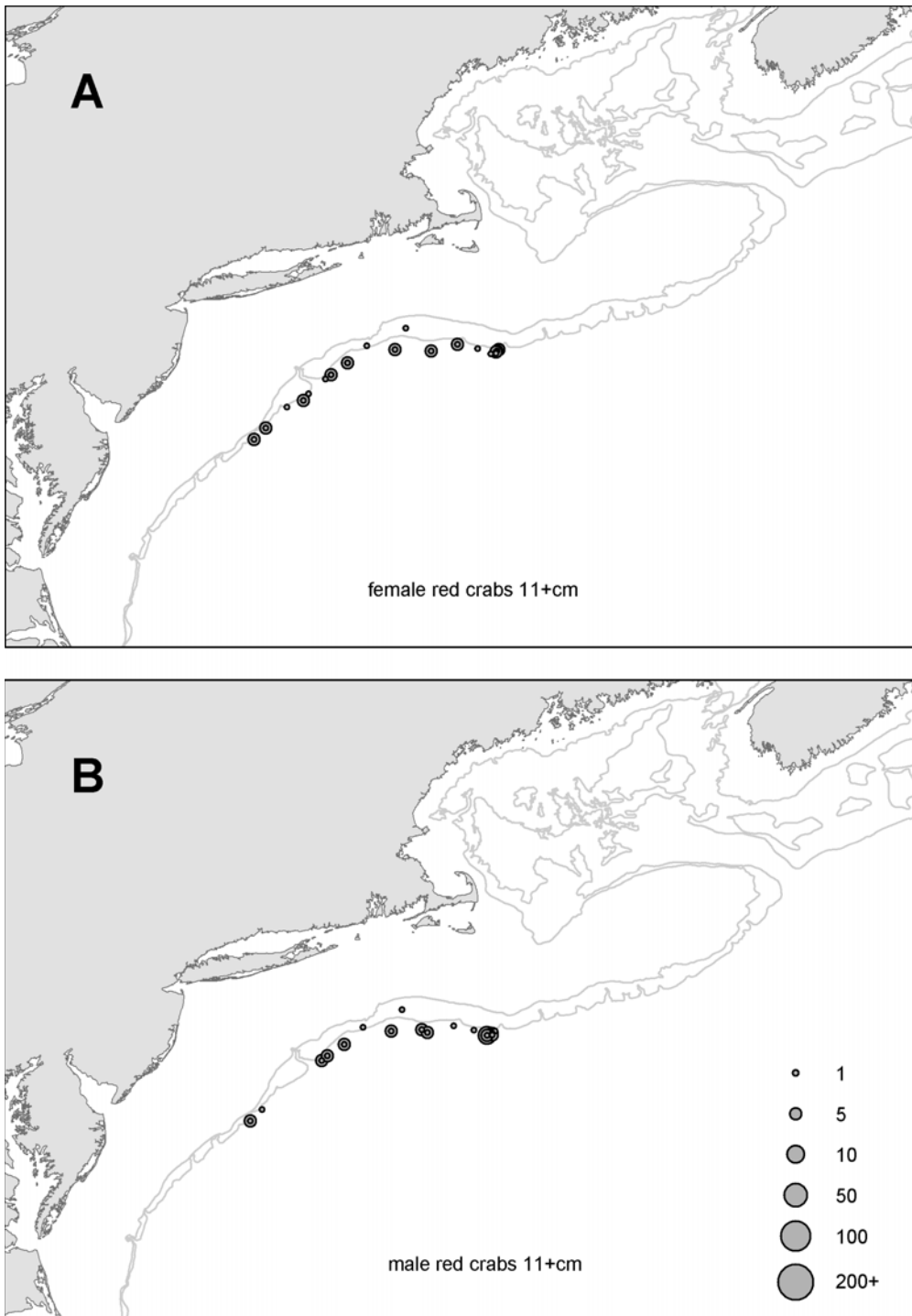


Figure D5.19. All female (A) and all male (B) red crabs over 10cm in carapace width from the 2001 NEFSC/NMFS cooperative monkfish survey.

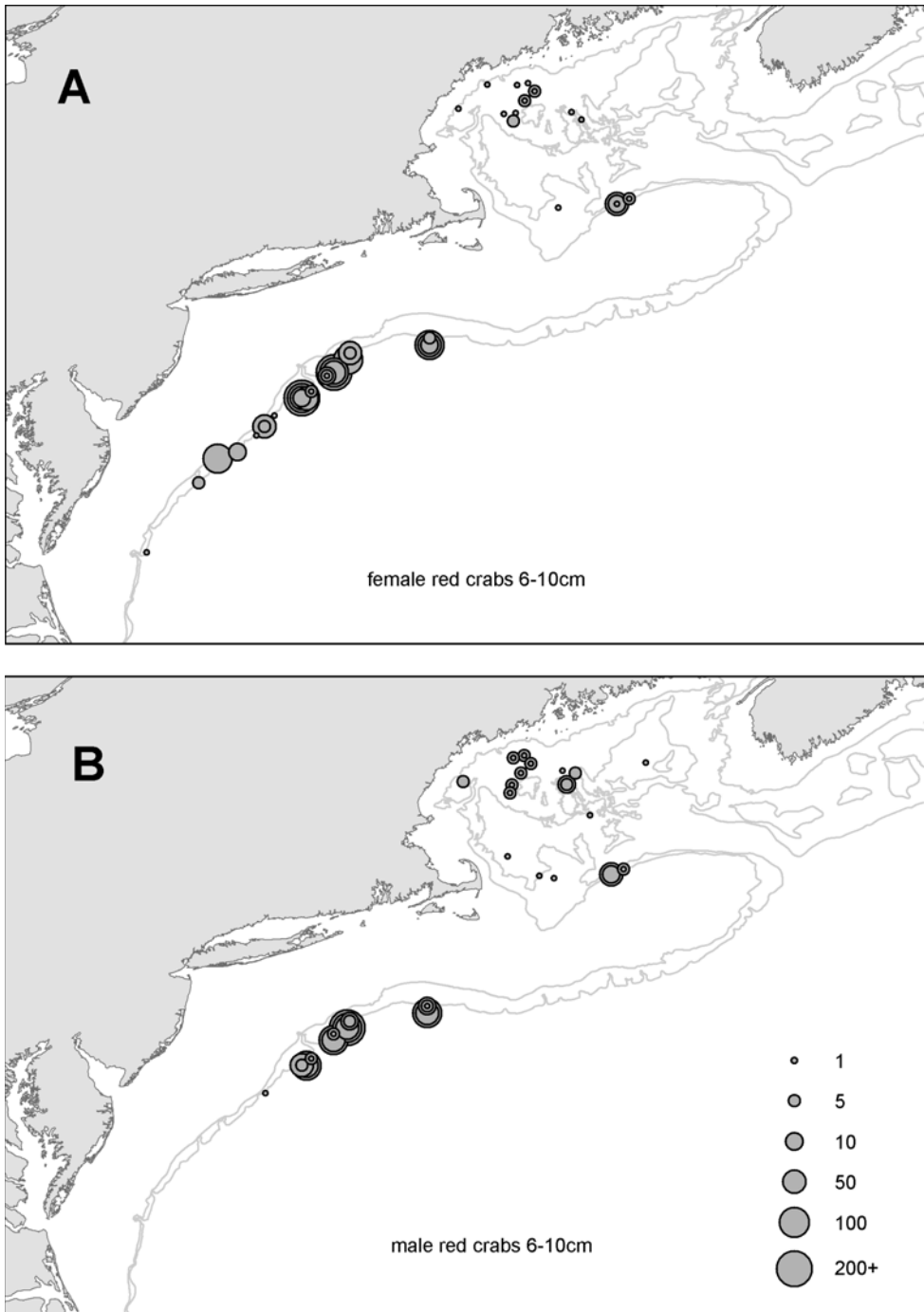


Figure D5.20. All female (A) and all male (B) red crabs 6-10cm in carapace width from the 2004 NEFSC/NMFS cooperative monkfish survey.

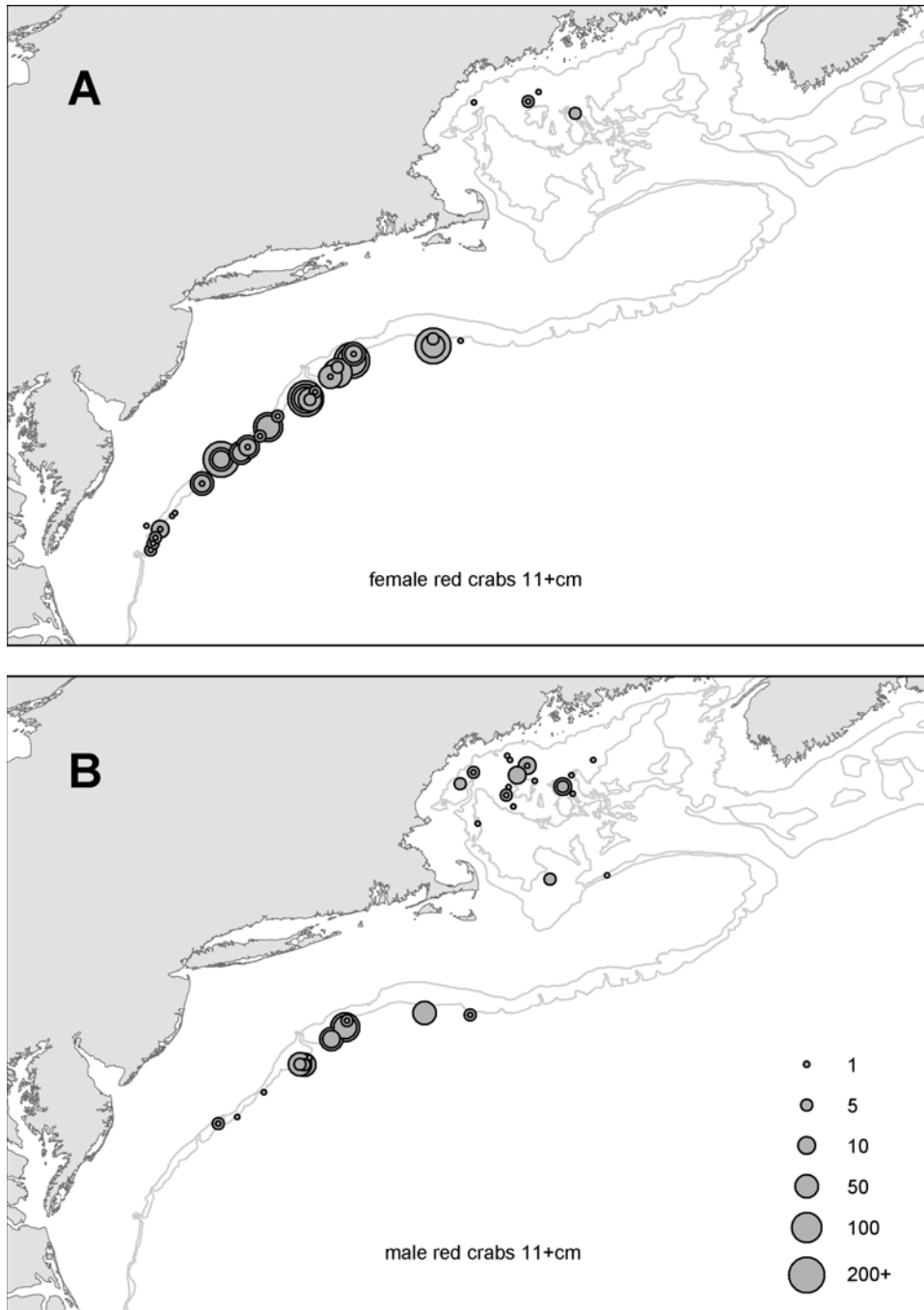


Figure D5.21. All female (A) and all male (B) red crabs over 10cm in carapace width from the 2004 NEFSC/NMFS cooperative monkfish survey.

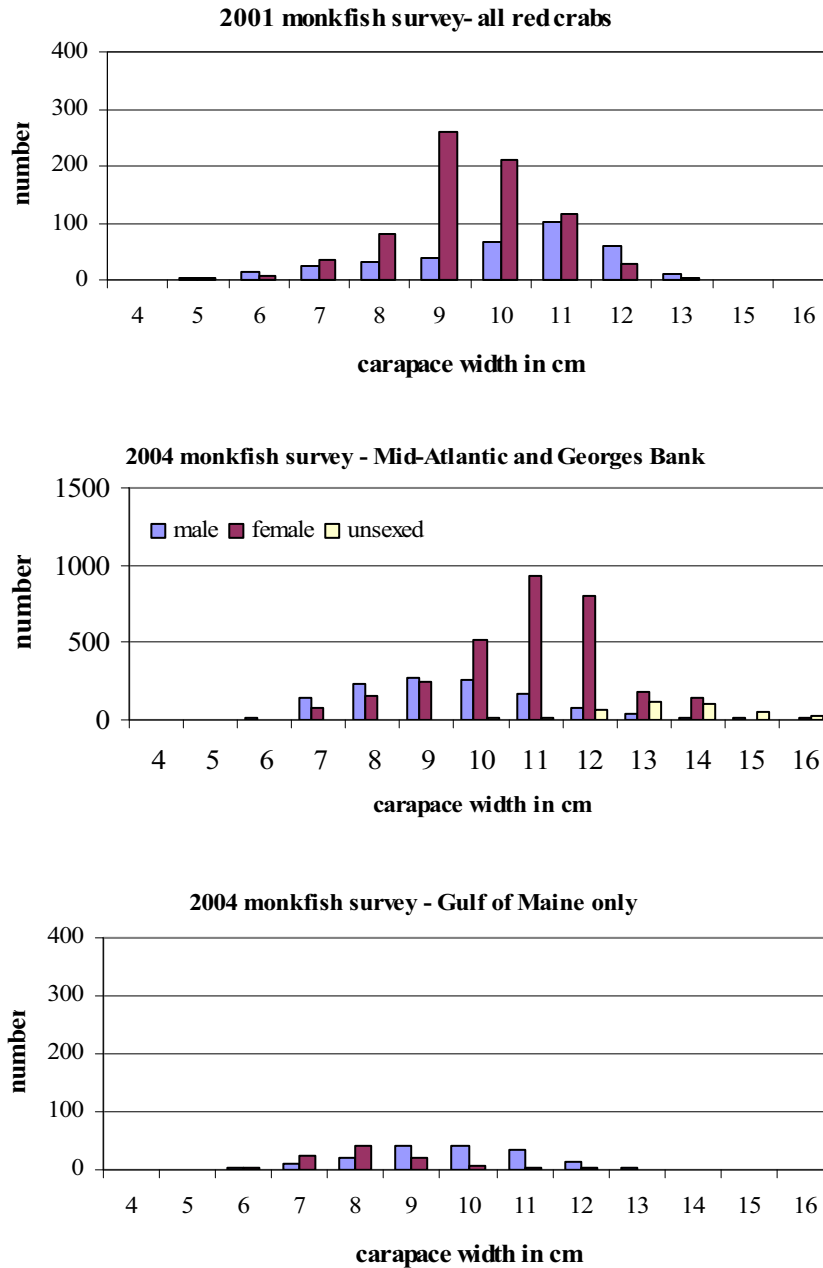


Figure D5.22. Length frequencies of red crabs from the 2001 and 2004 cooperative monkfish surveys. In 2004, the Gulf of Maine crabs are plotted separately. (Data from the Gulf of Maine portion of the 2001 monkfish survey were not available).

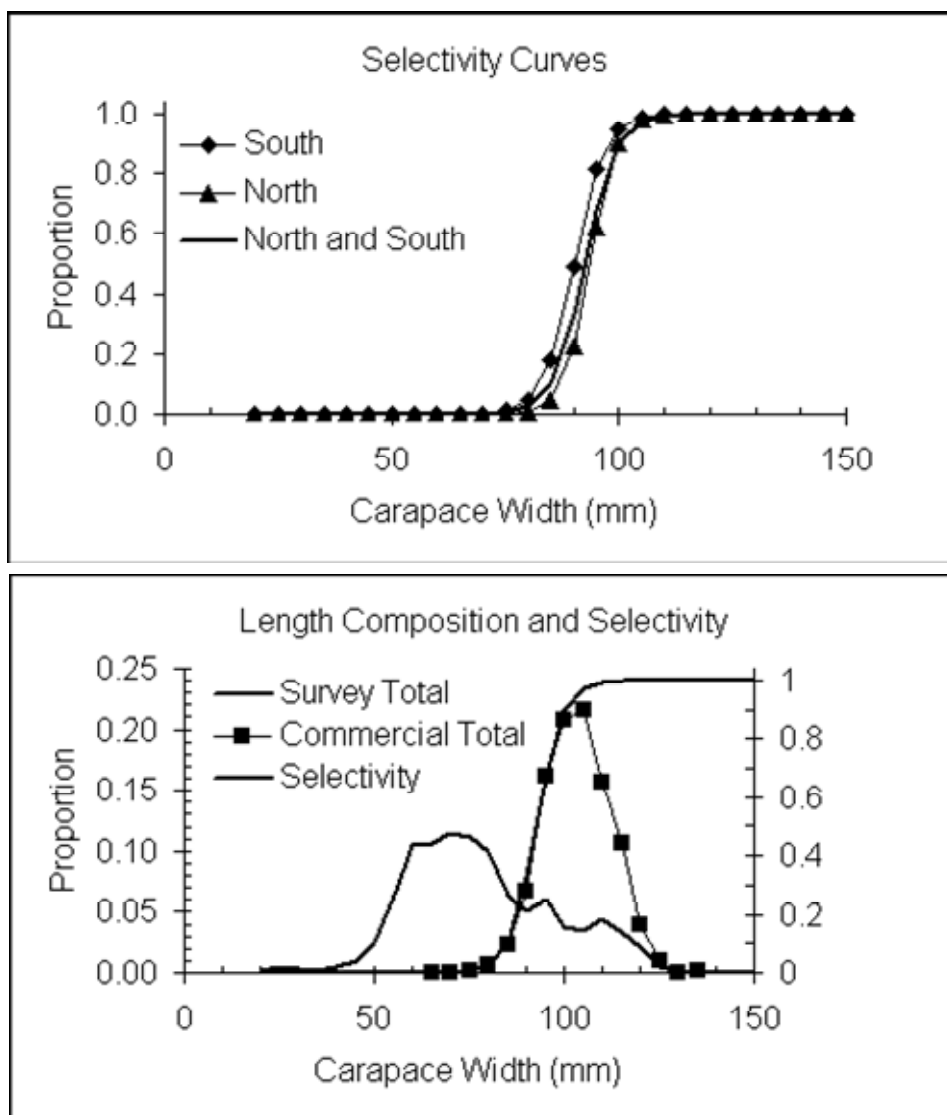


Figure D7.1. Fishery and survey length composition data with fishery selectivity curves for deep-sea red crab in the northern and southern regions during 2004-2005.