Appendix A8. Plots of SCA model output

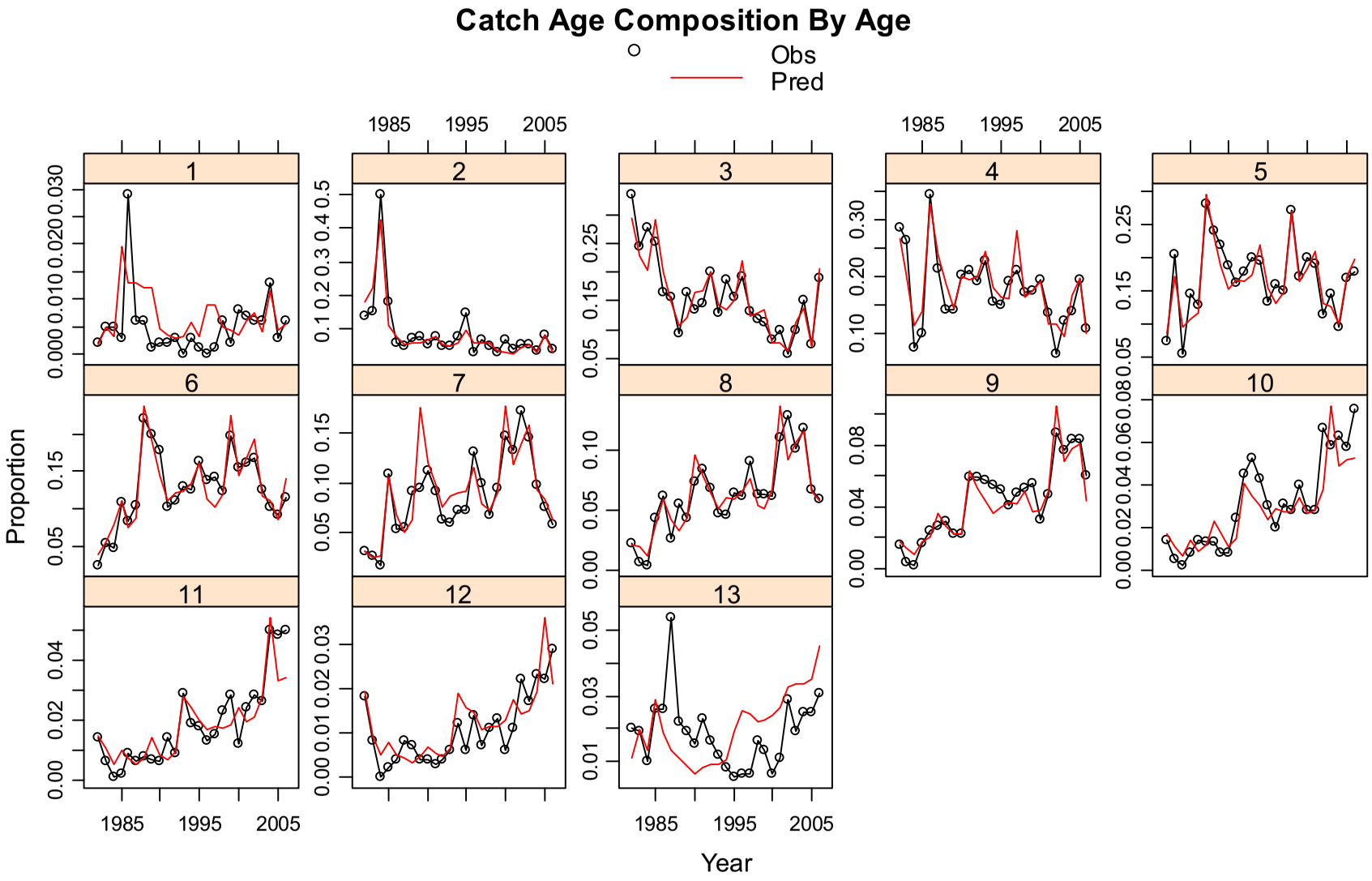

Figure 1. Plots of observed and predicted catch proportions-at-age by age

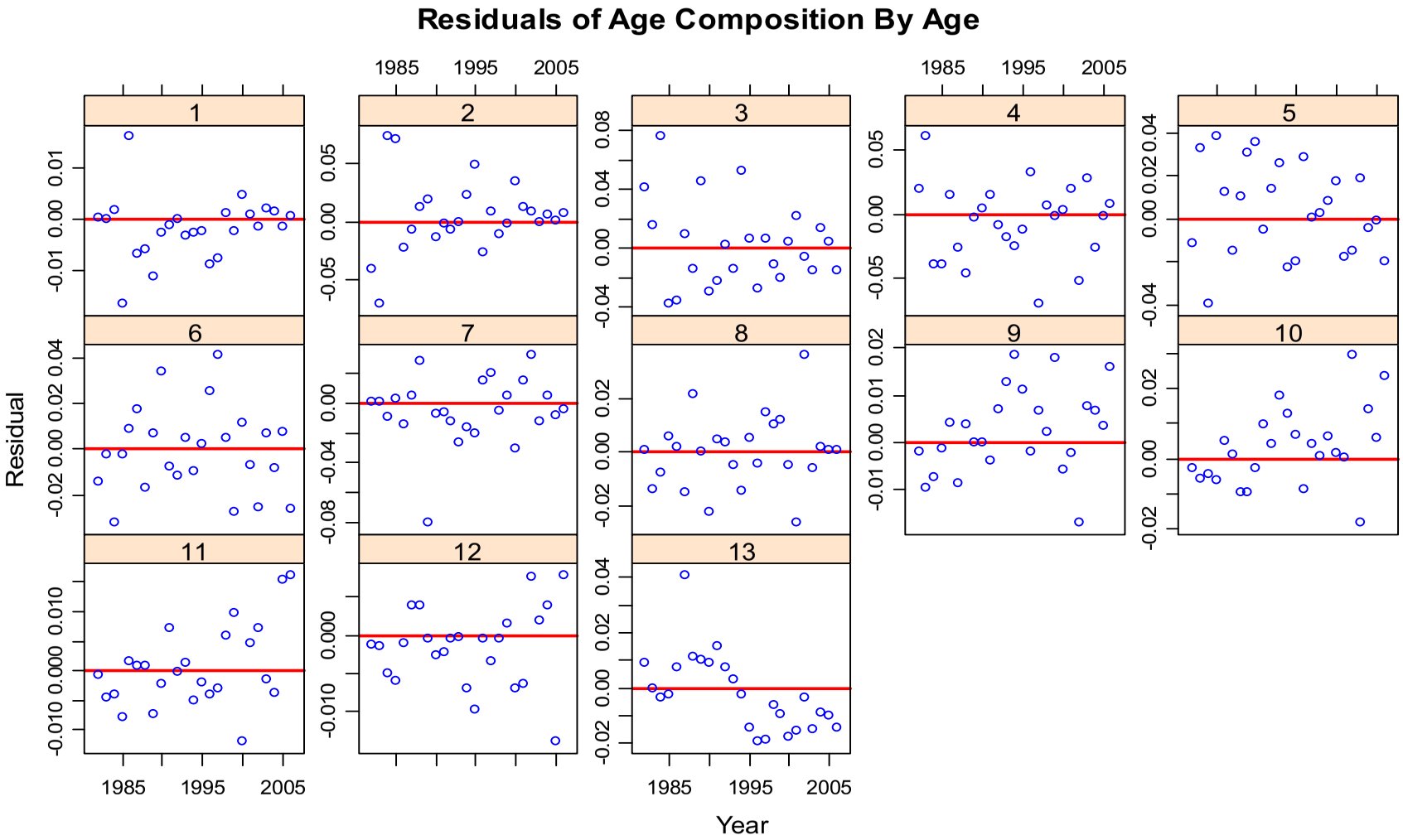

Figure 2. Residuals of catch proportions-at-age by age.

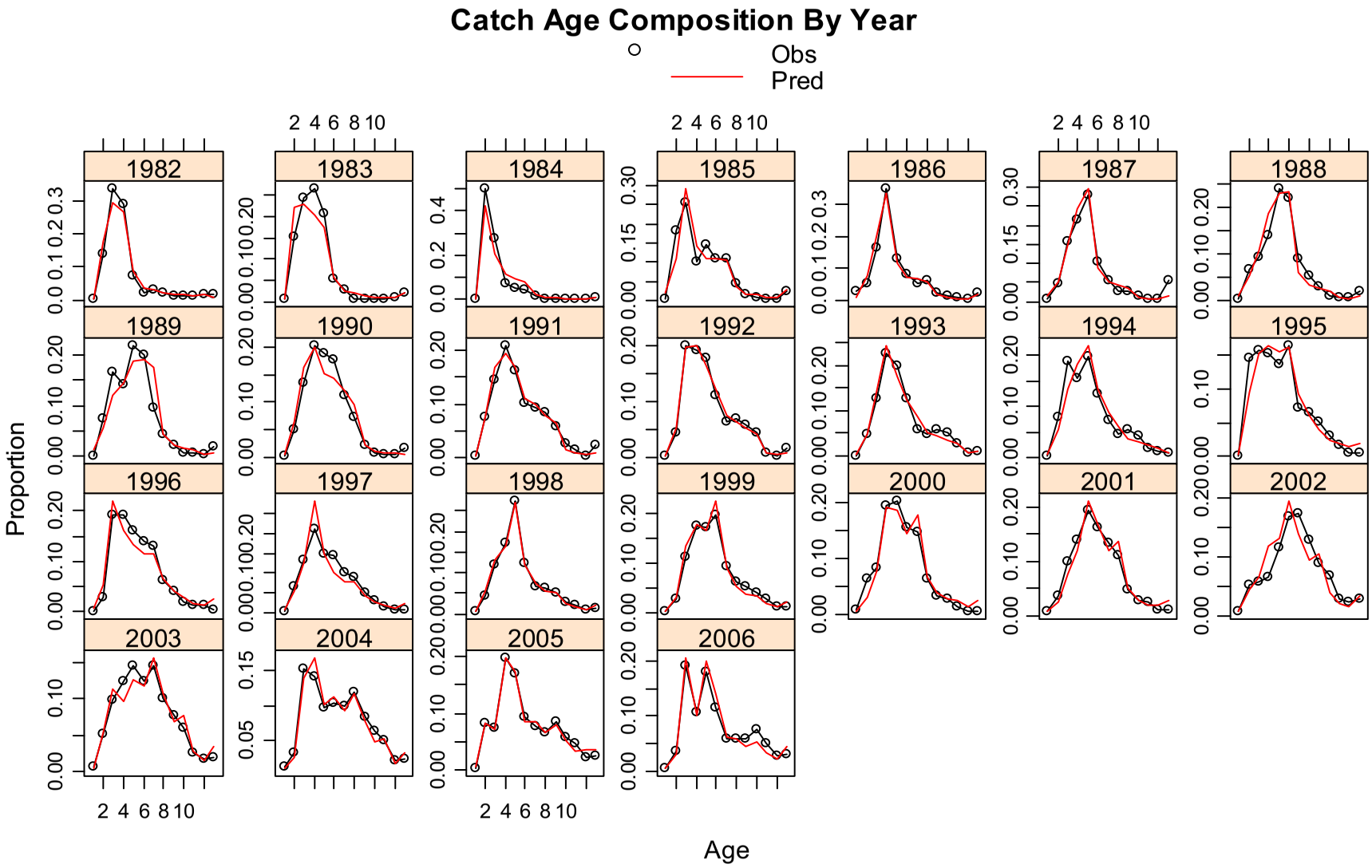

Figure 3. Observed and predicted catch proportions-at-age by year.

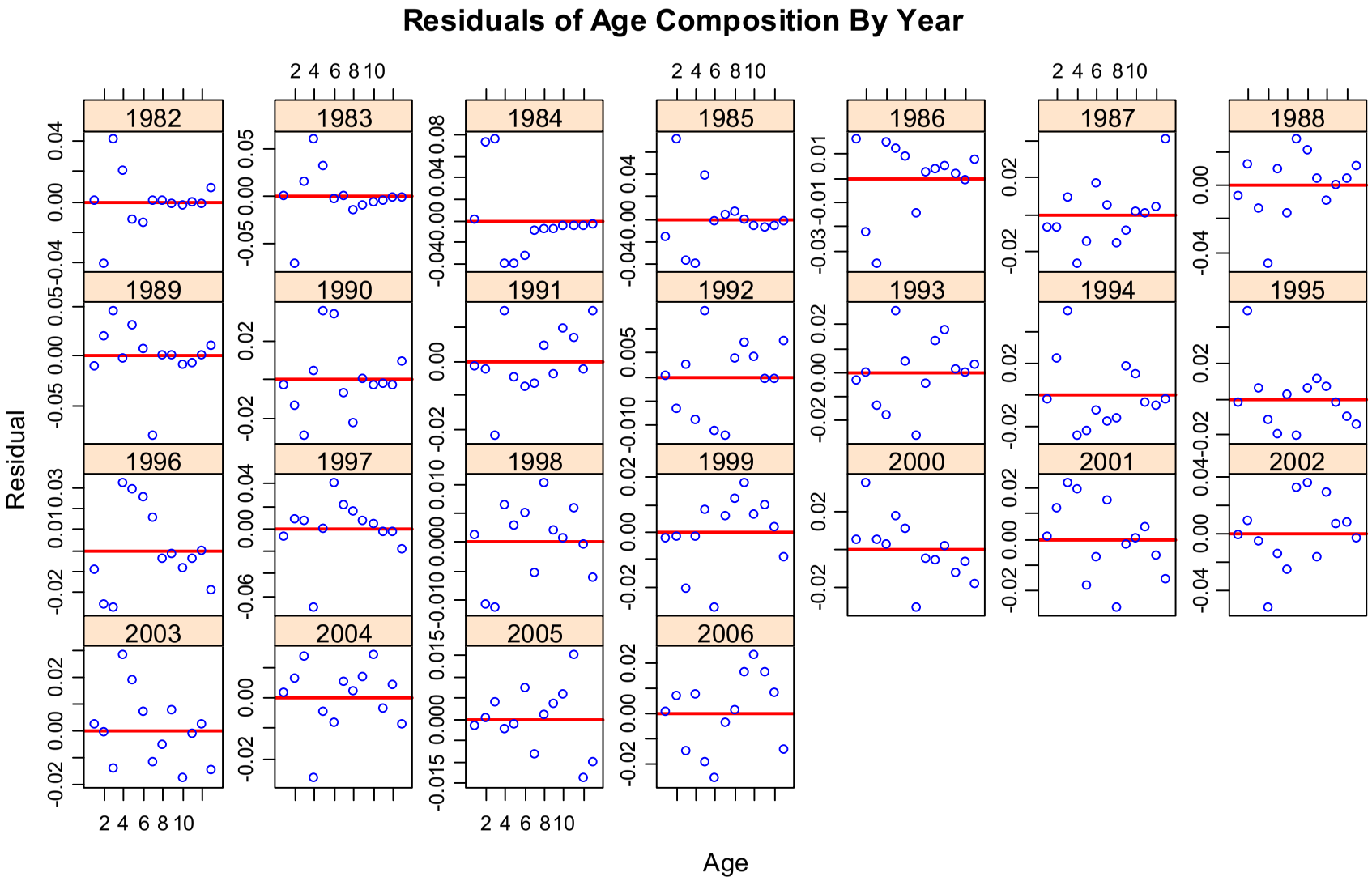

Figure 4. Residuals of catch proportions-at-age by year.

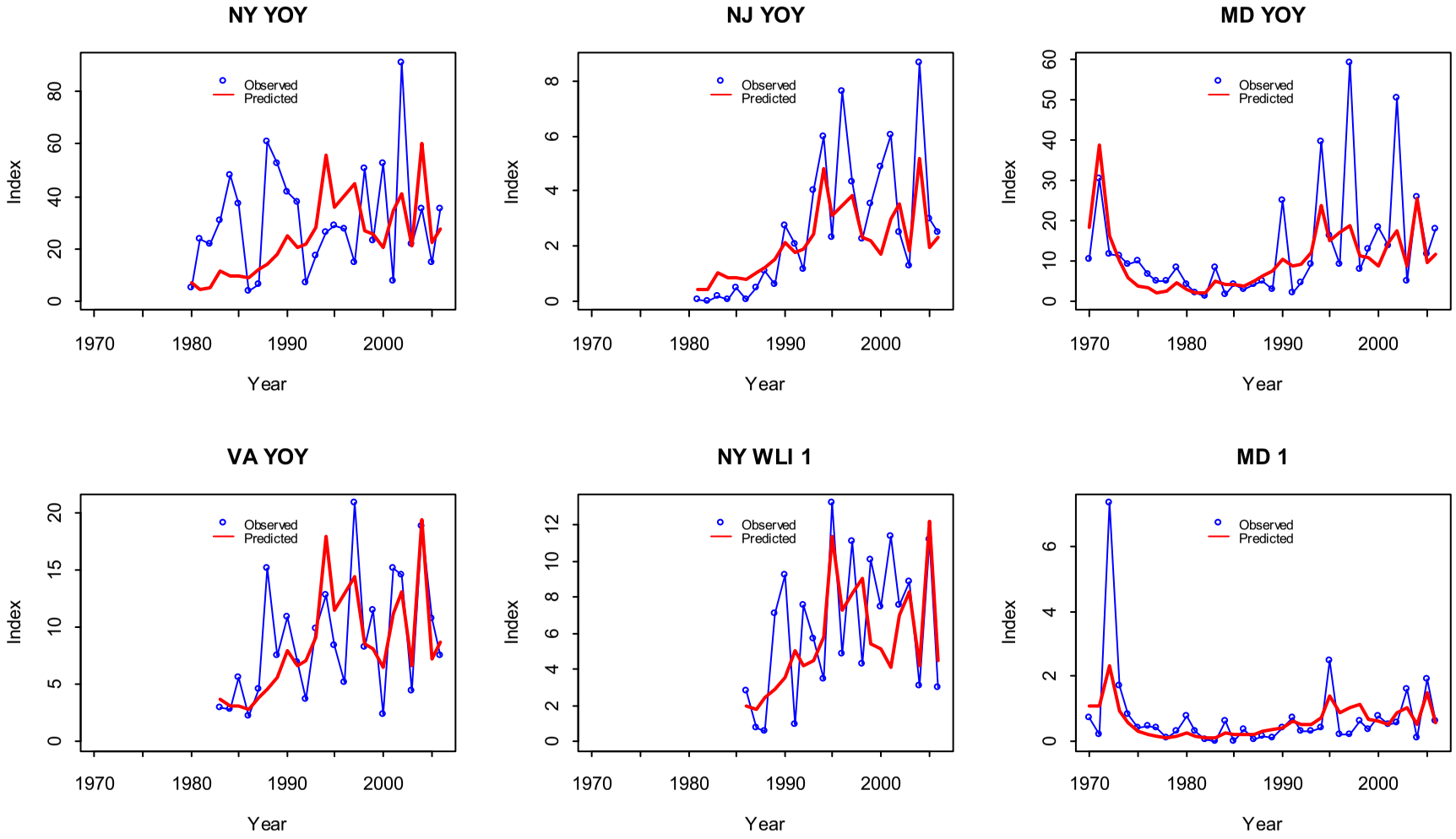

Figure 5. Young-of-the-year and yearling surveys tuned to Age 1 and 2, respectively.

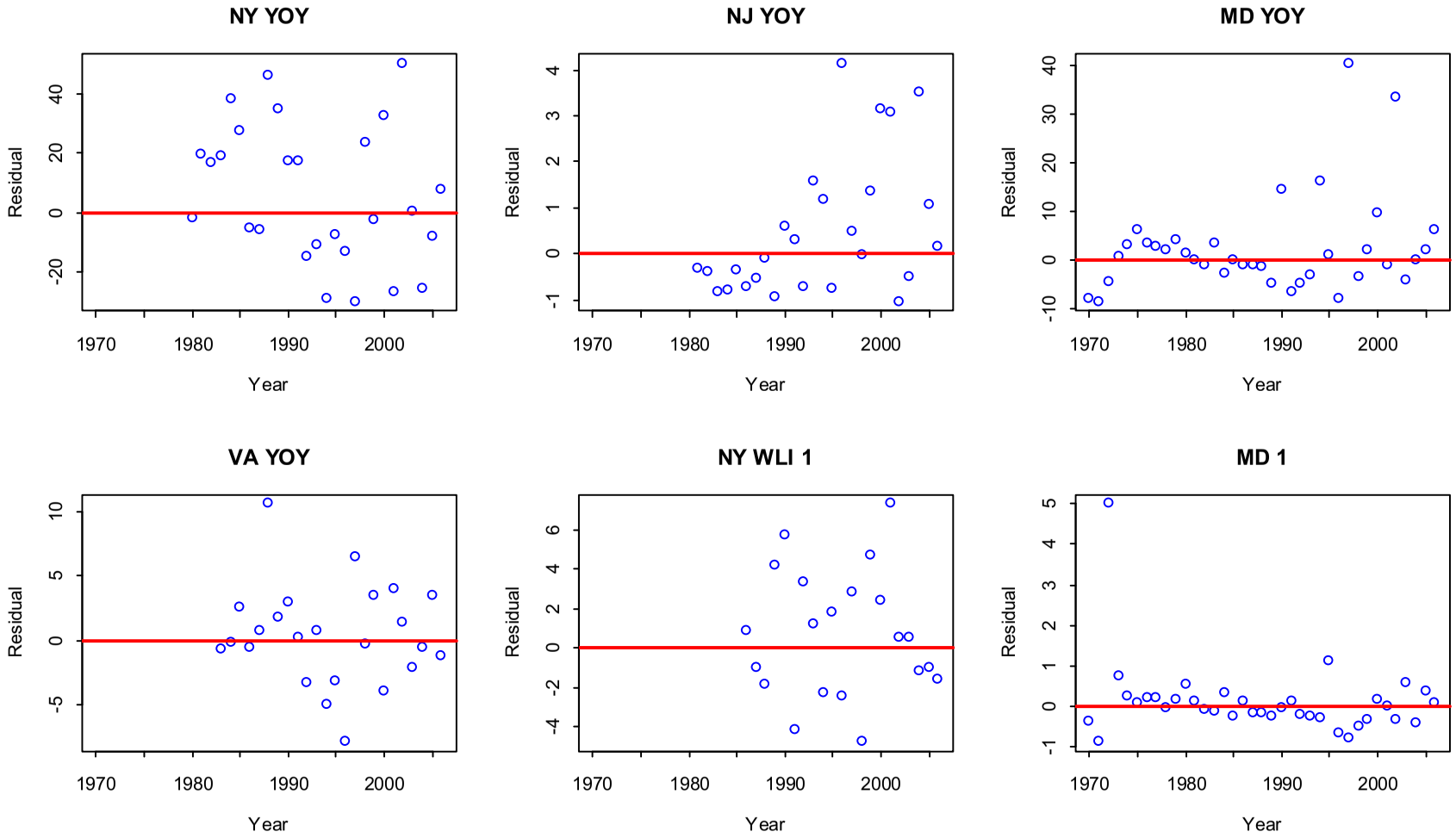

Figure 6. Residuals (observed-predicted) for young-of-the-year and yearling surveys.

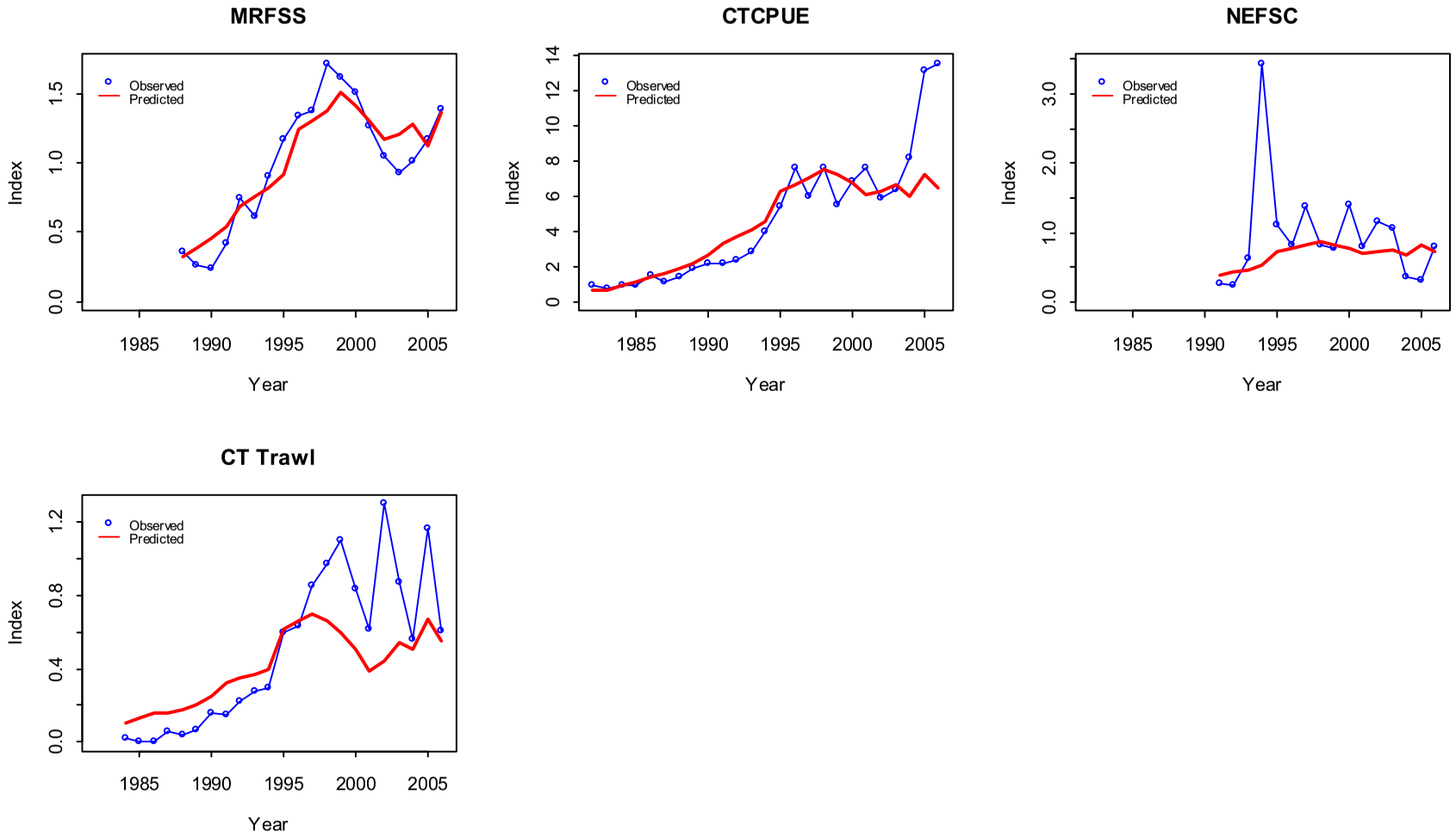

Figure 7. Observed and predicted aggregate indices.

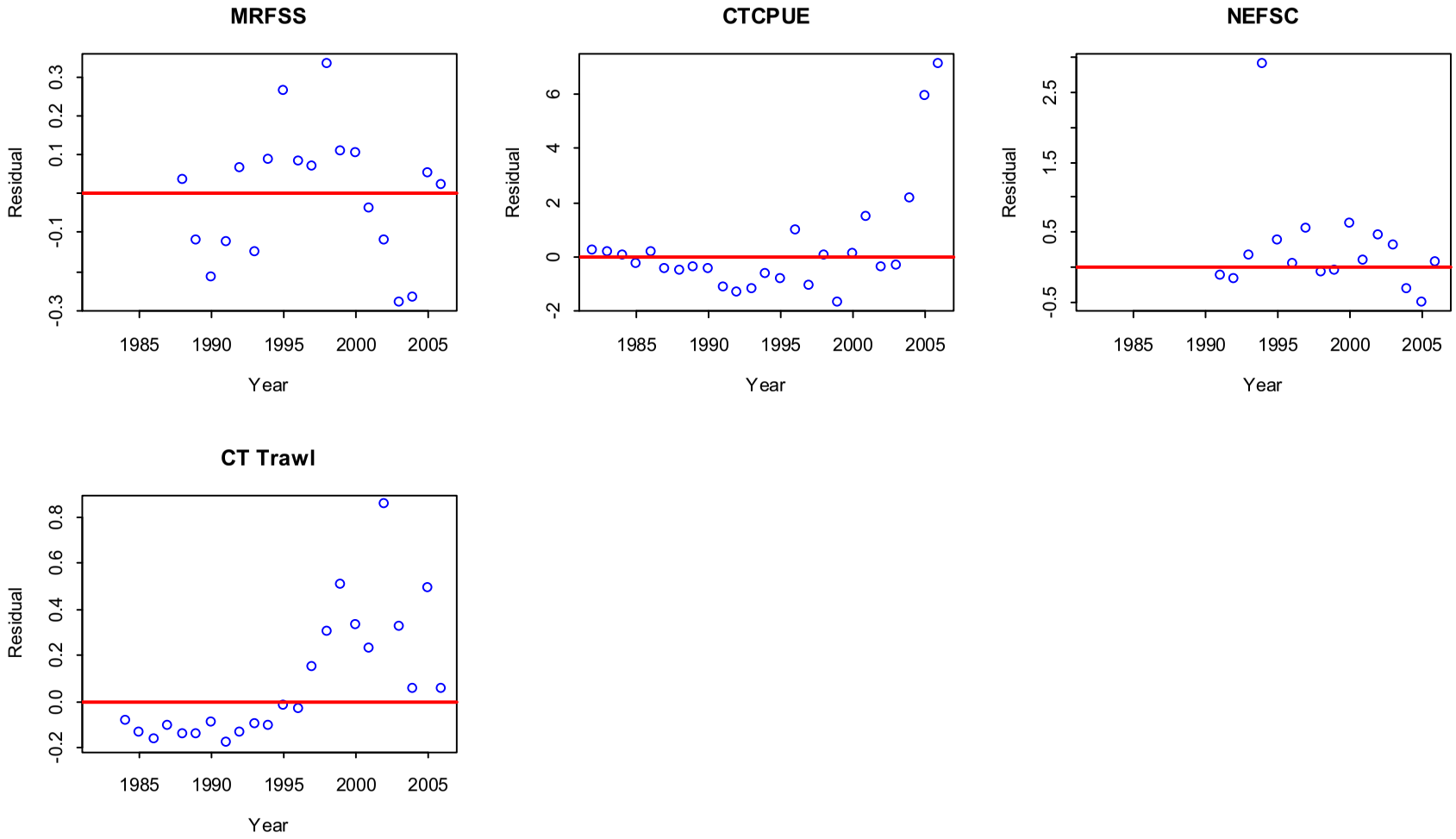

Figure 8. Residuals for aggregate indices.

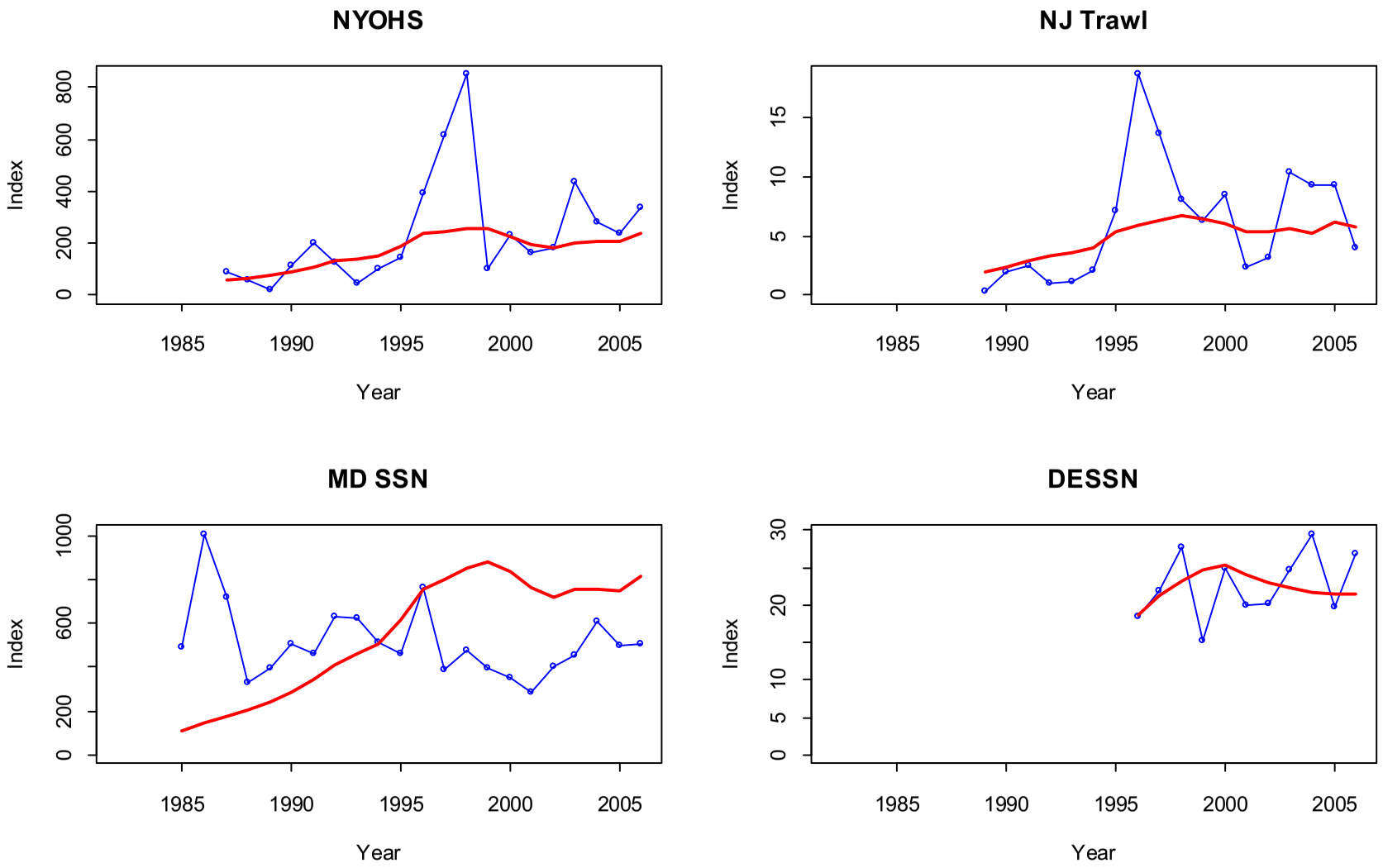

Figure 9. Observed (blue) and predicted (red) aggregate indices for surveys with age composition data.

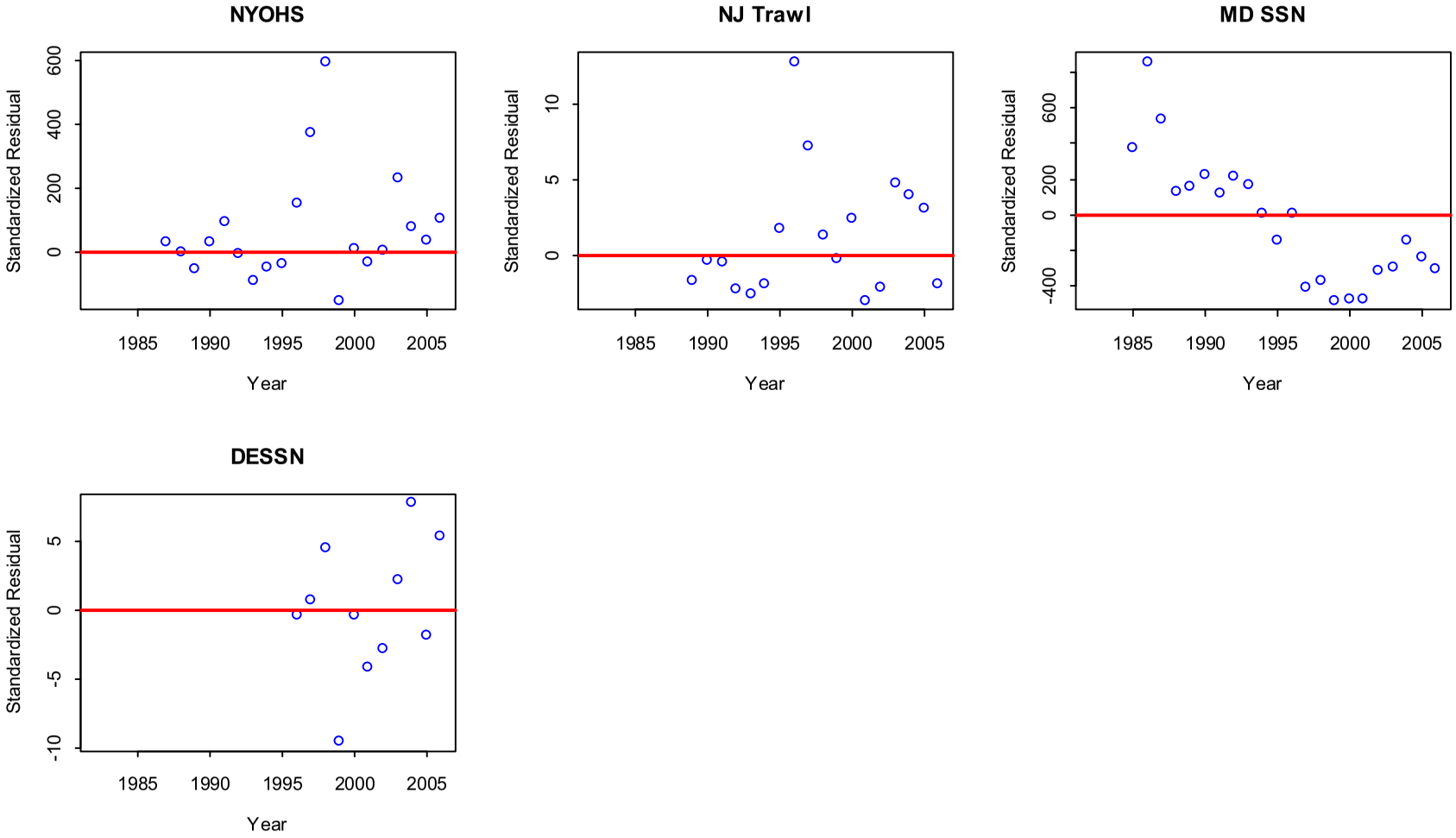

Figure 10. Residuals for aggregate indices with age composition data.

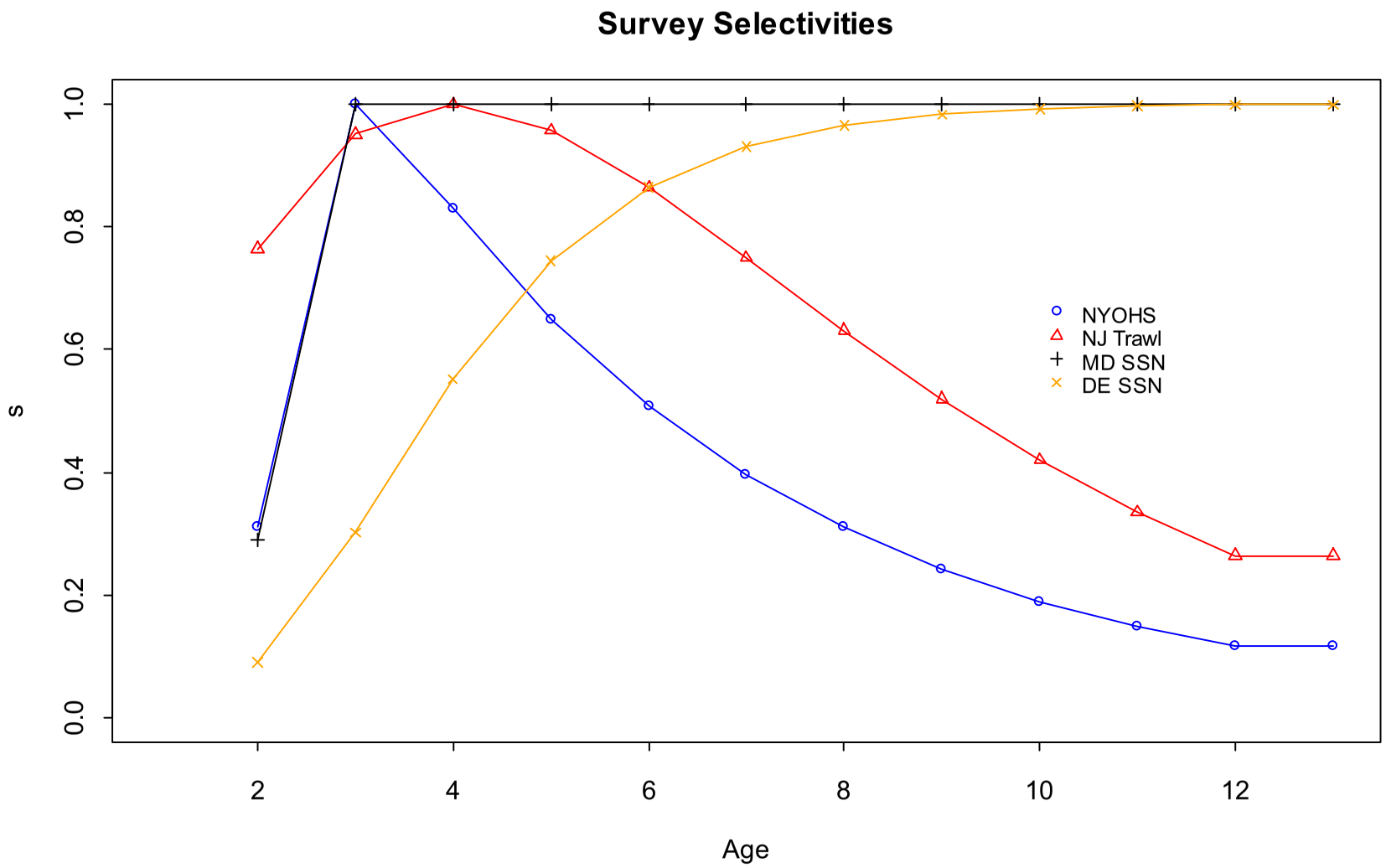

Figure 11. Selectivity patterns estimated for the NYOHS, NJ Trawl, MD SSN, and DE SSN surveys.

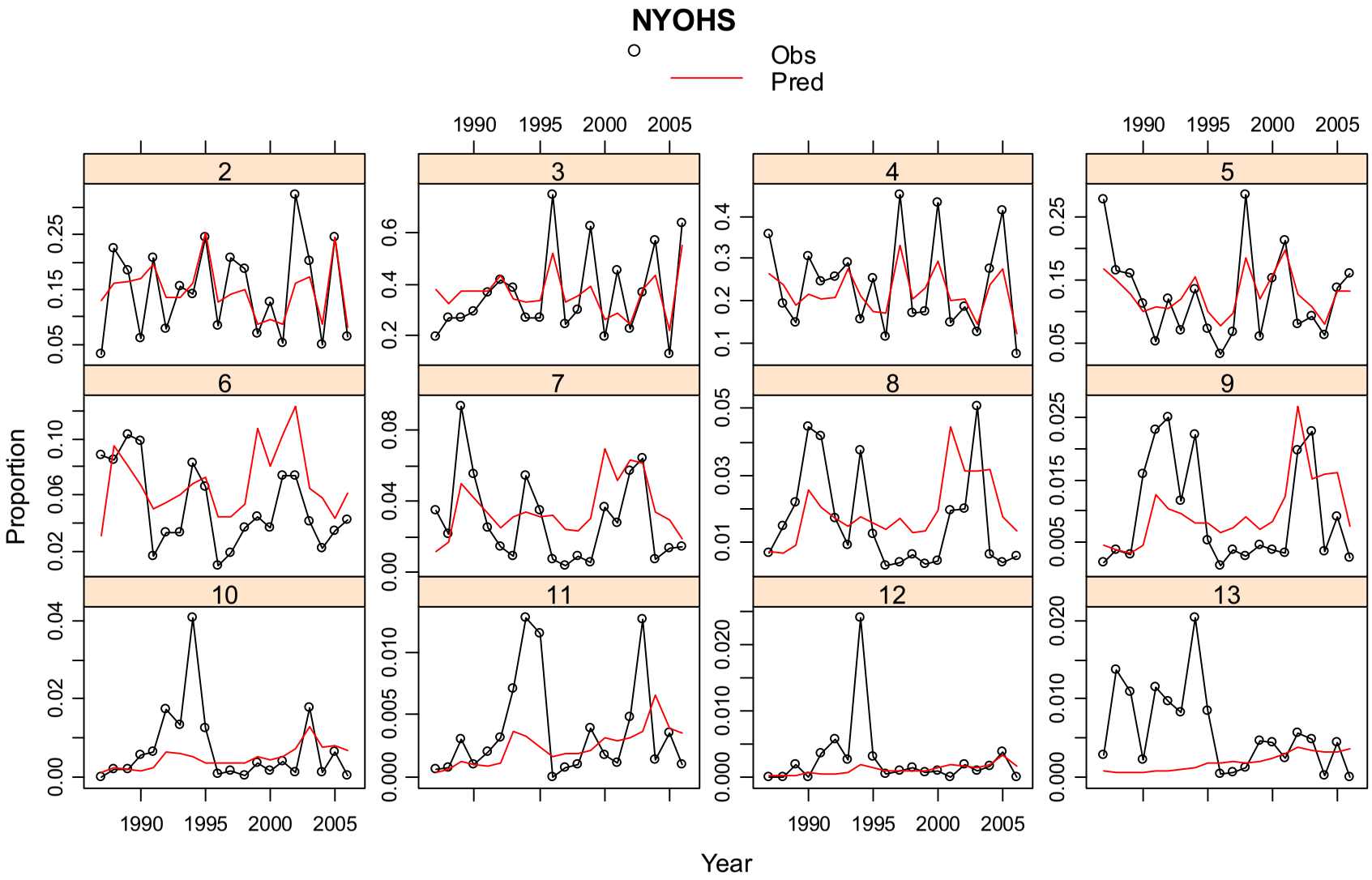

Figure 12. Observed and predicted proportions-at-age for each year by age for the NYOHS survey.

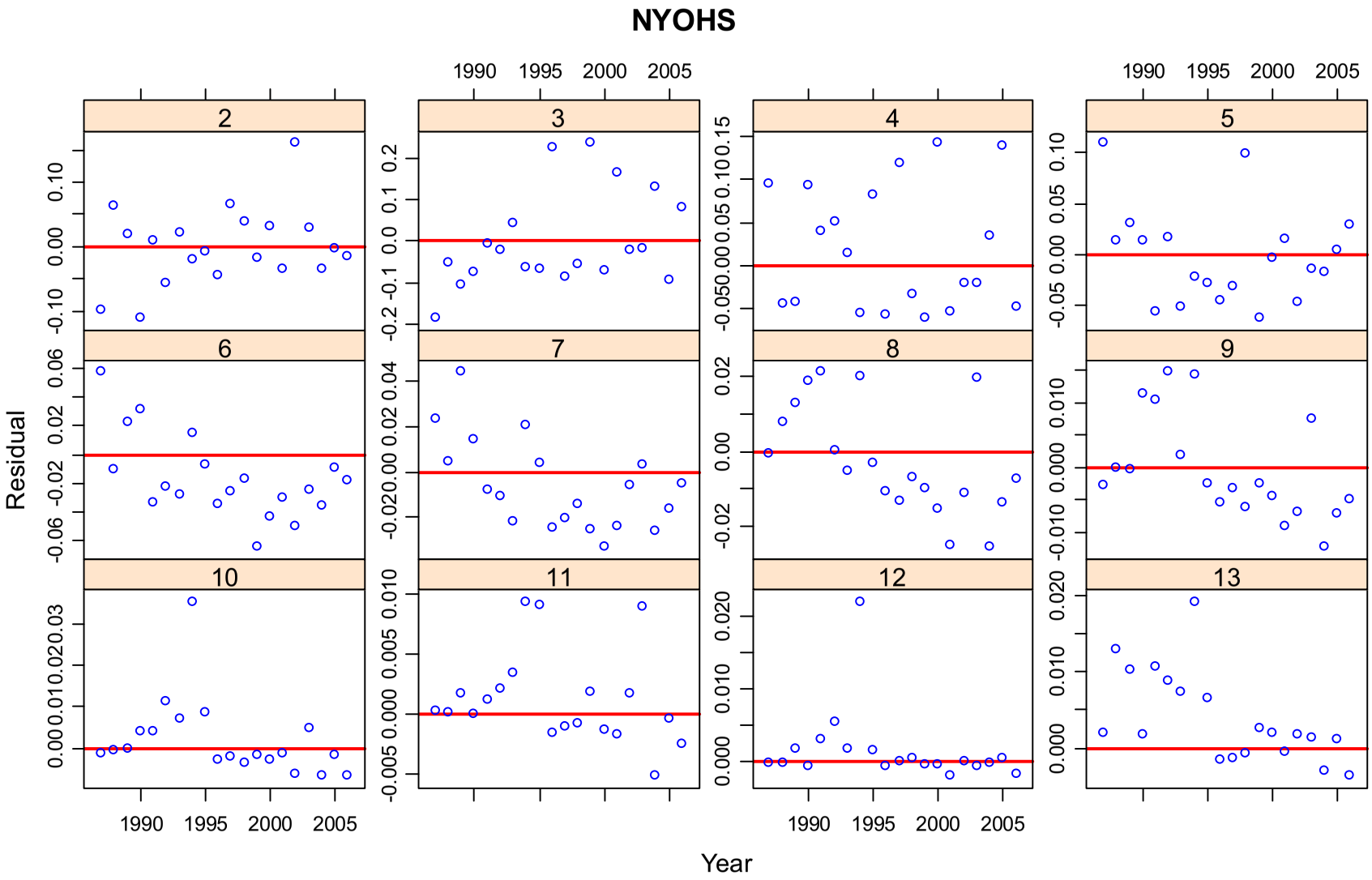

Figure 13. Residuals of proportions-at-age in each year by age for the NYOHS survey.

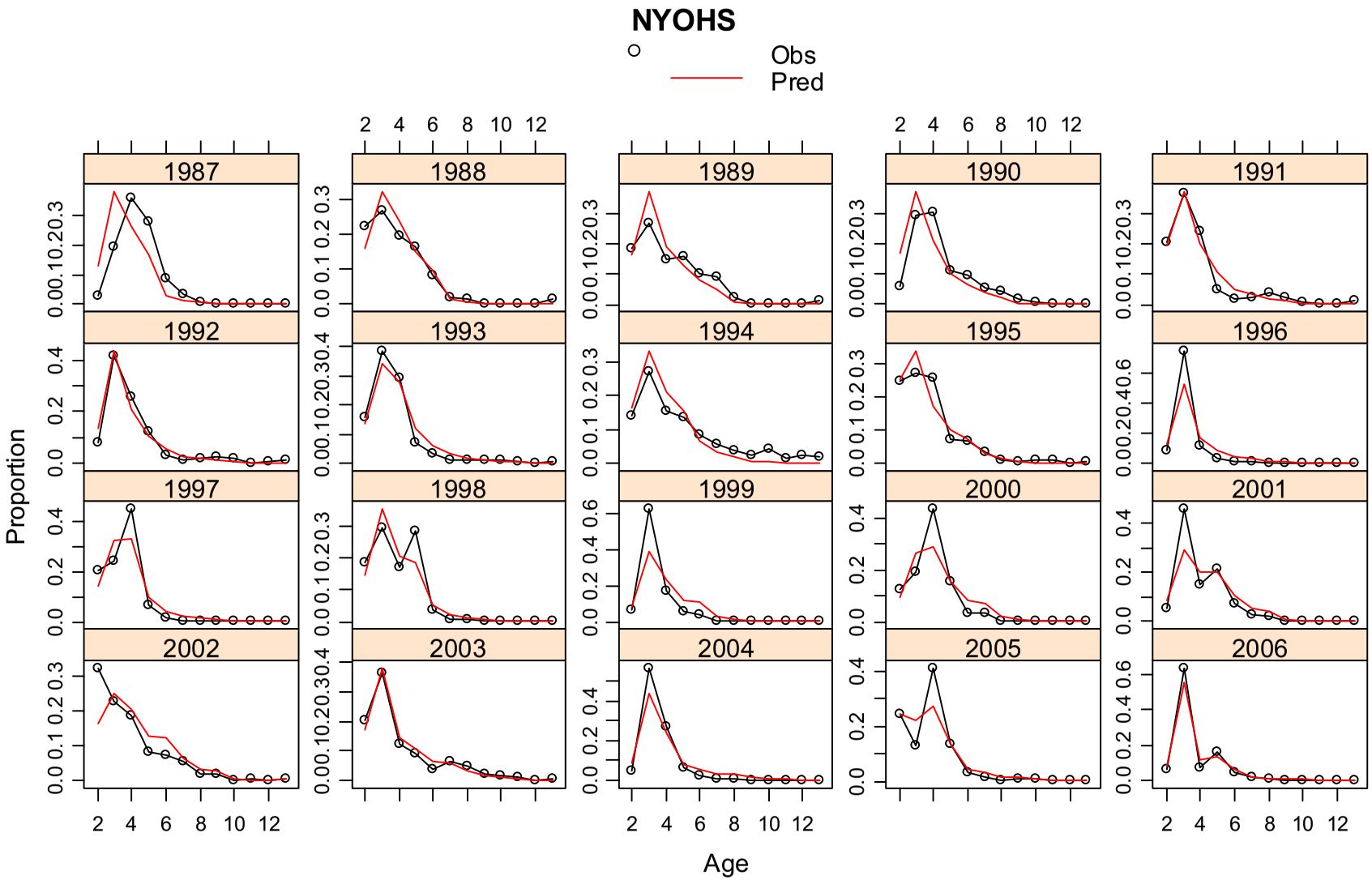

Figure 14. Observed and predicted proportions-at-age for each age by year for the NYOHS survey.

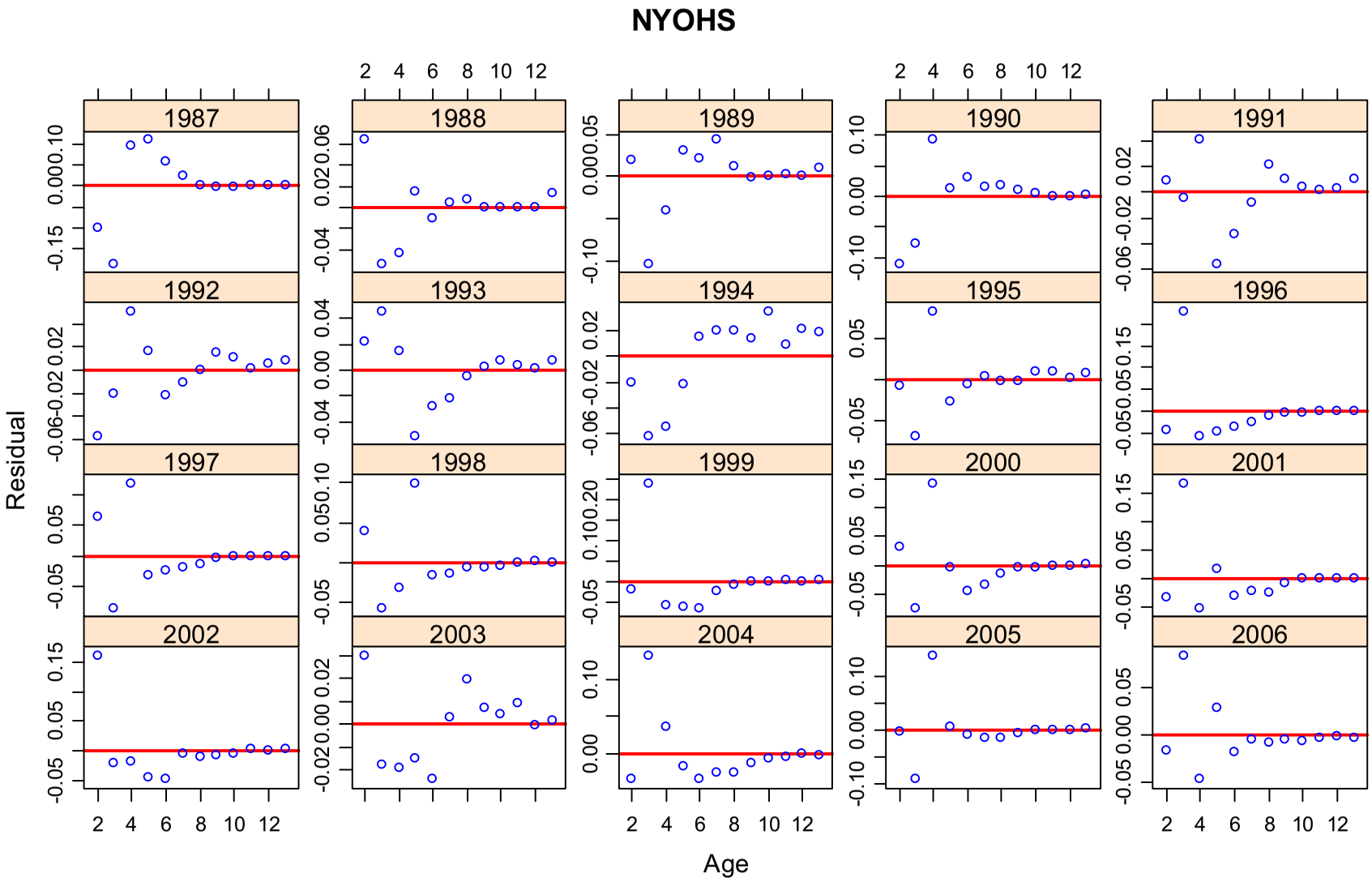

Figure 15. Residuals of proportions-at-age for each age by year for the NYOHS survey.

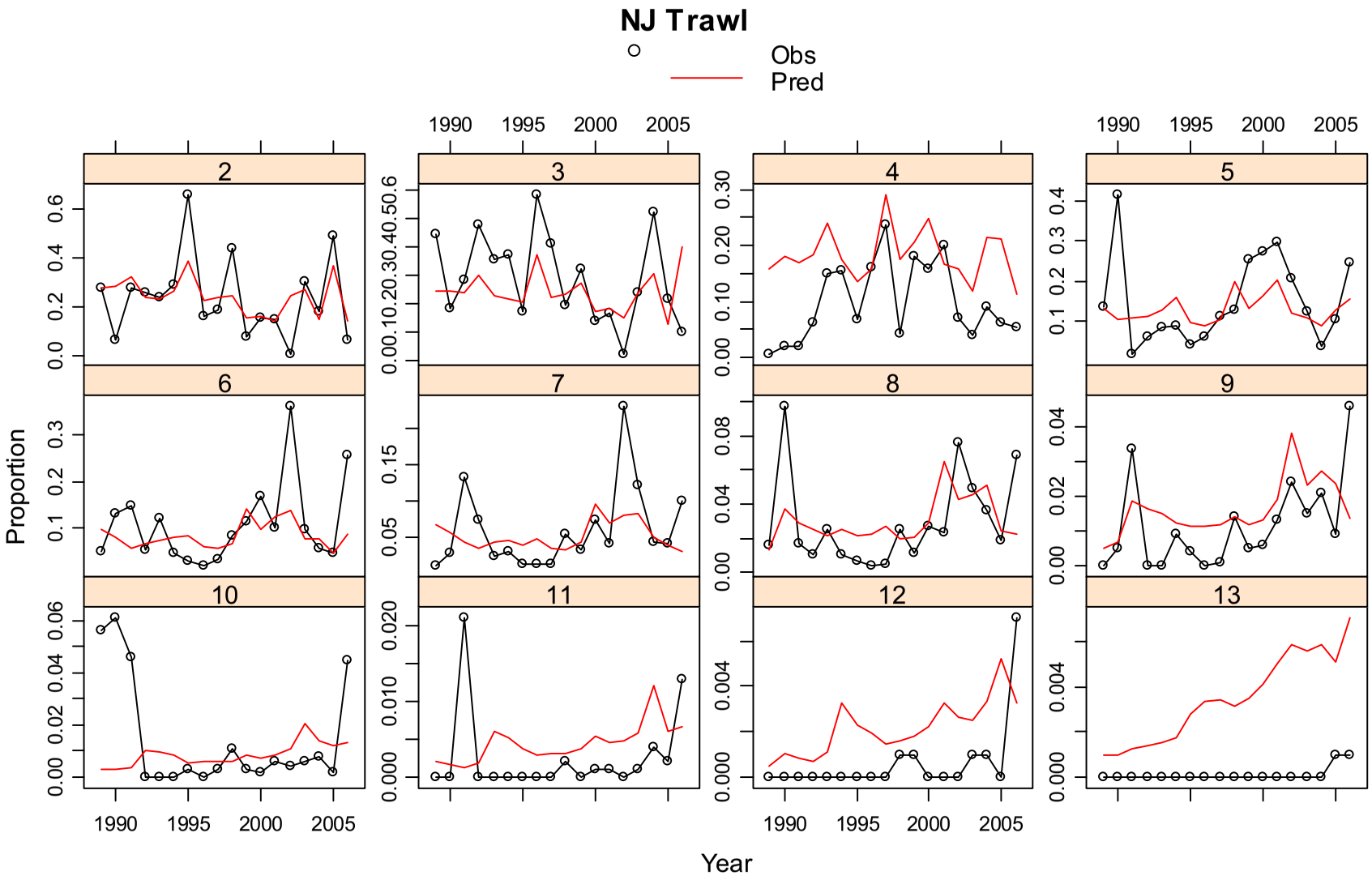

Figure 16. Observed and predicted proportions-at-age for each year by age for the NJ Trawl survey.

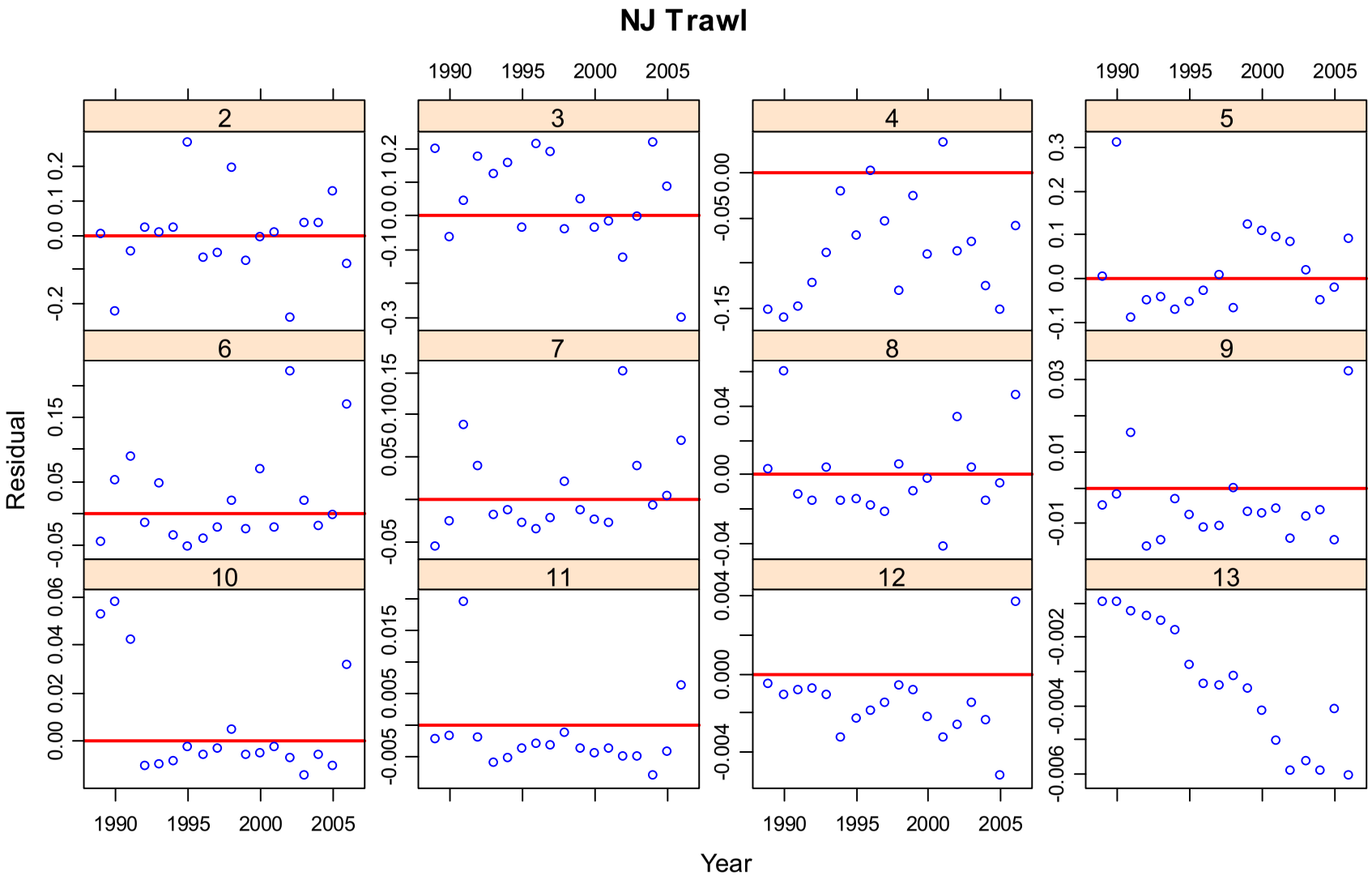

Figure 17. Residuals of proportions-at-age for each year by age for the NJ Trawl survey.

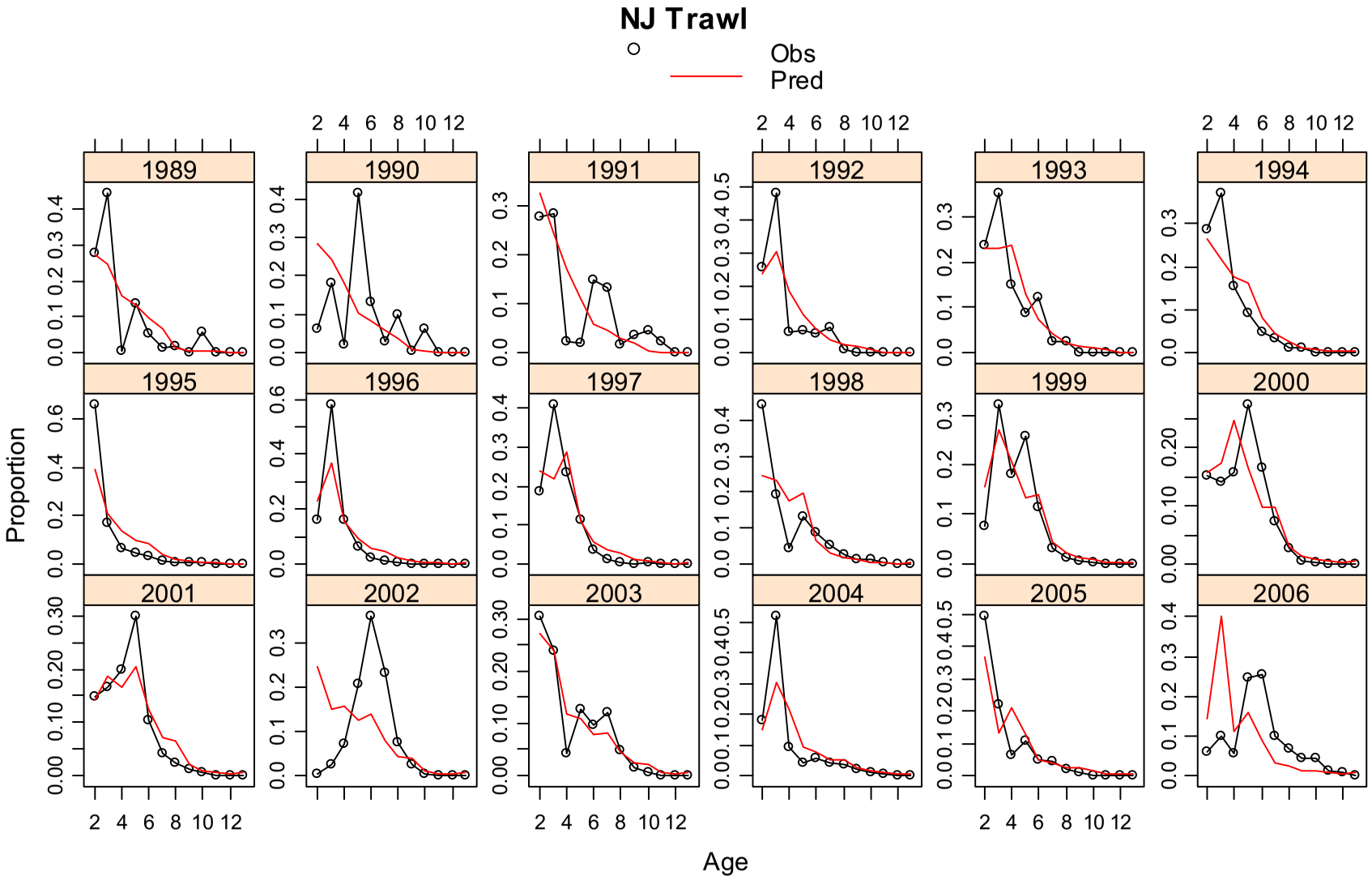

Figure 18. Observed and predicted proportions-at-age for each age by year for the NJ Trawl survey.

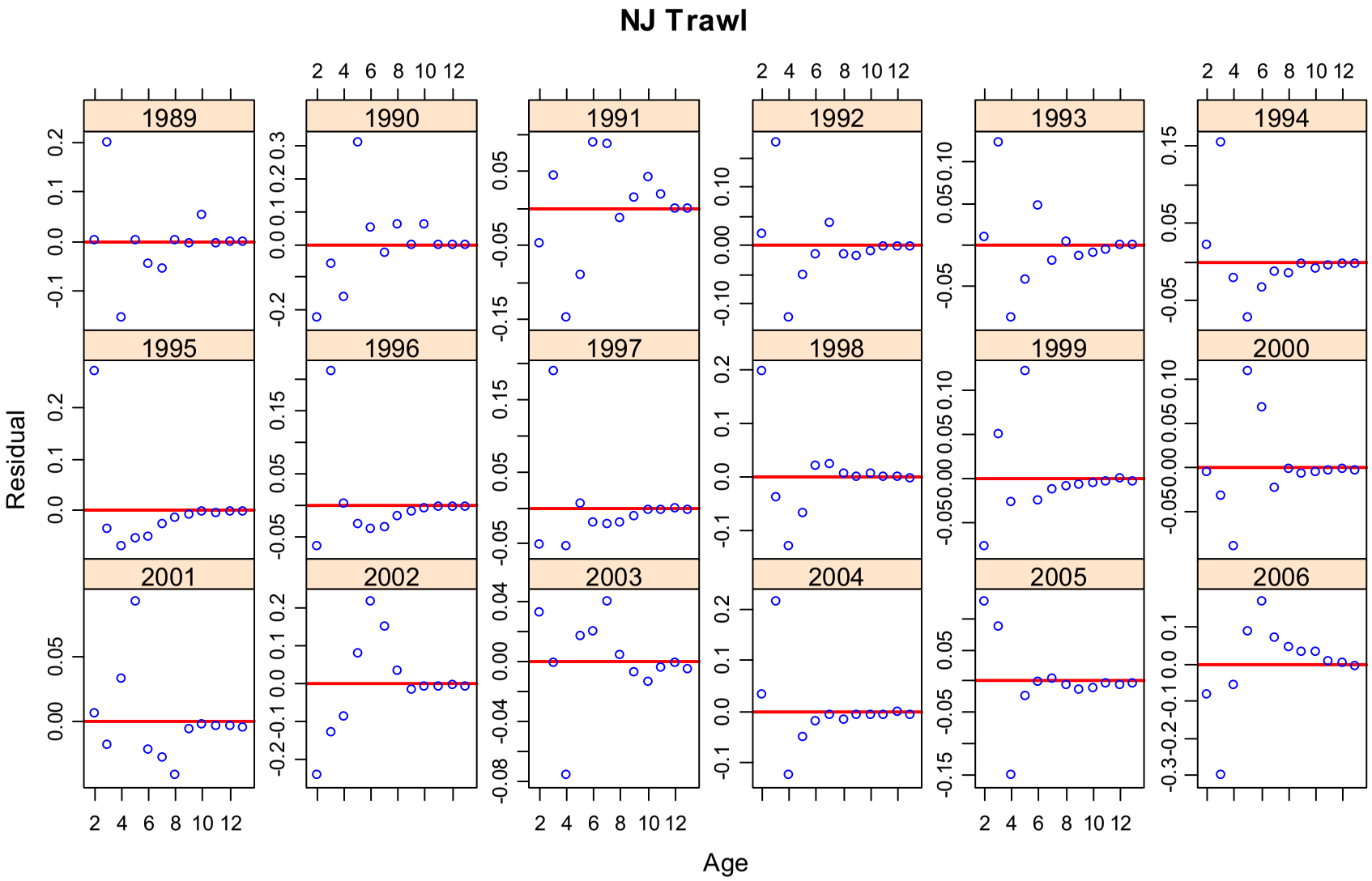

Figure 19. Residuals of proportions-at-age for each age by year for the NJ Trawl survey.

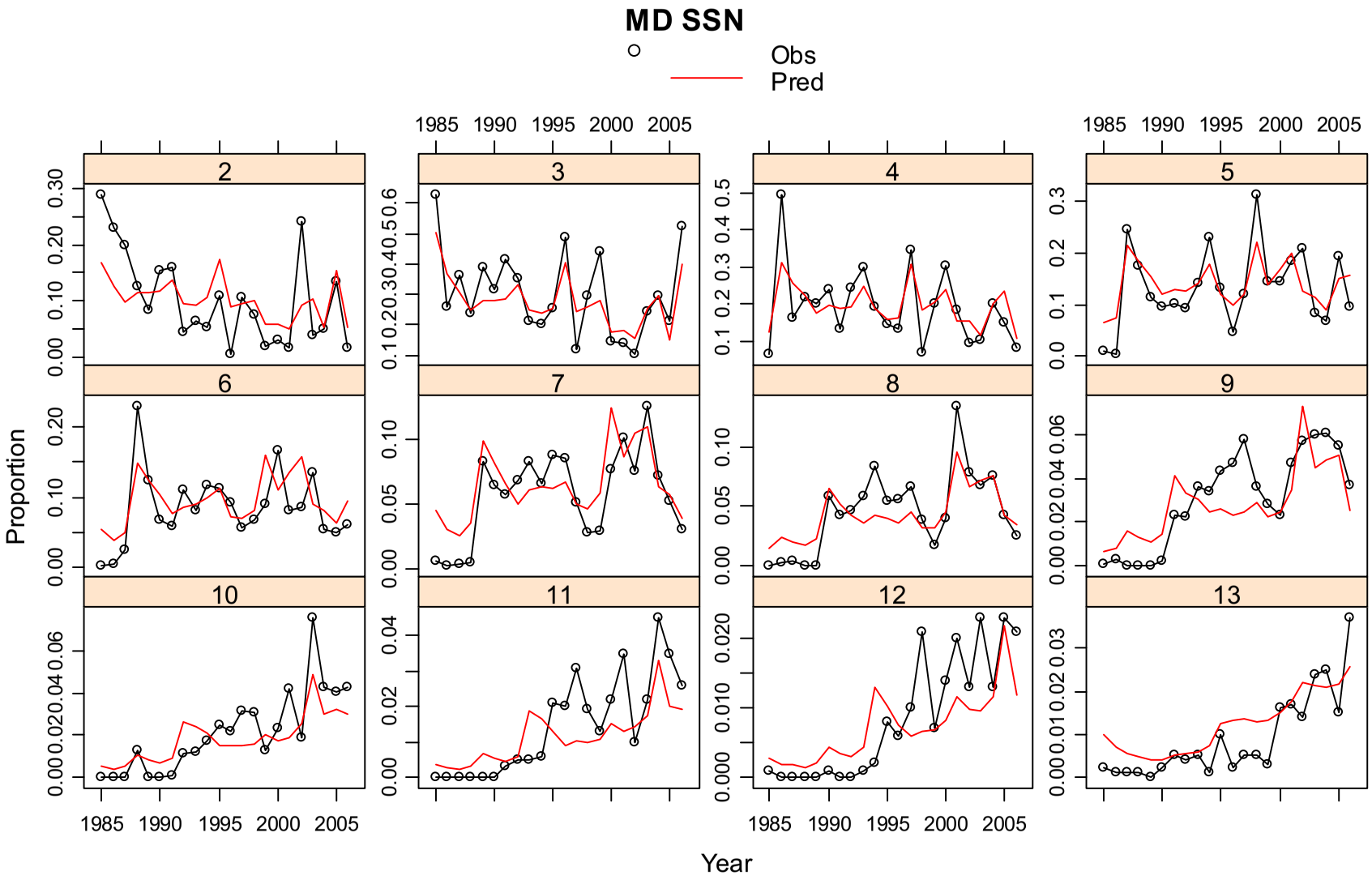

Figure 20. Observed and predicted proportions-at-age for each year by age for the MD SSN gillnet survey.

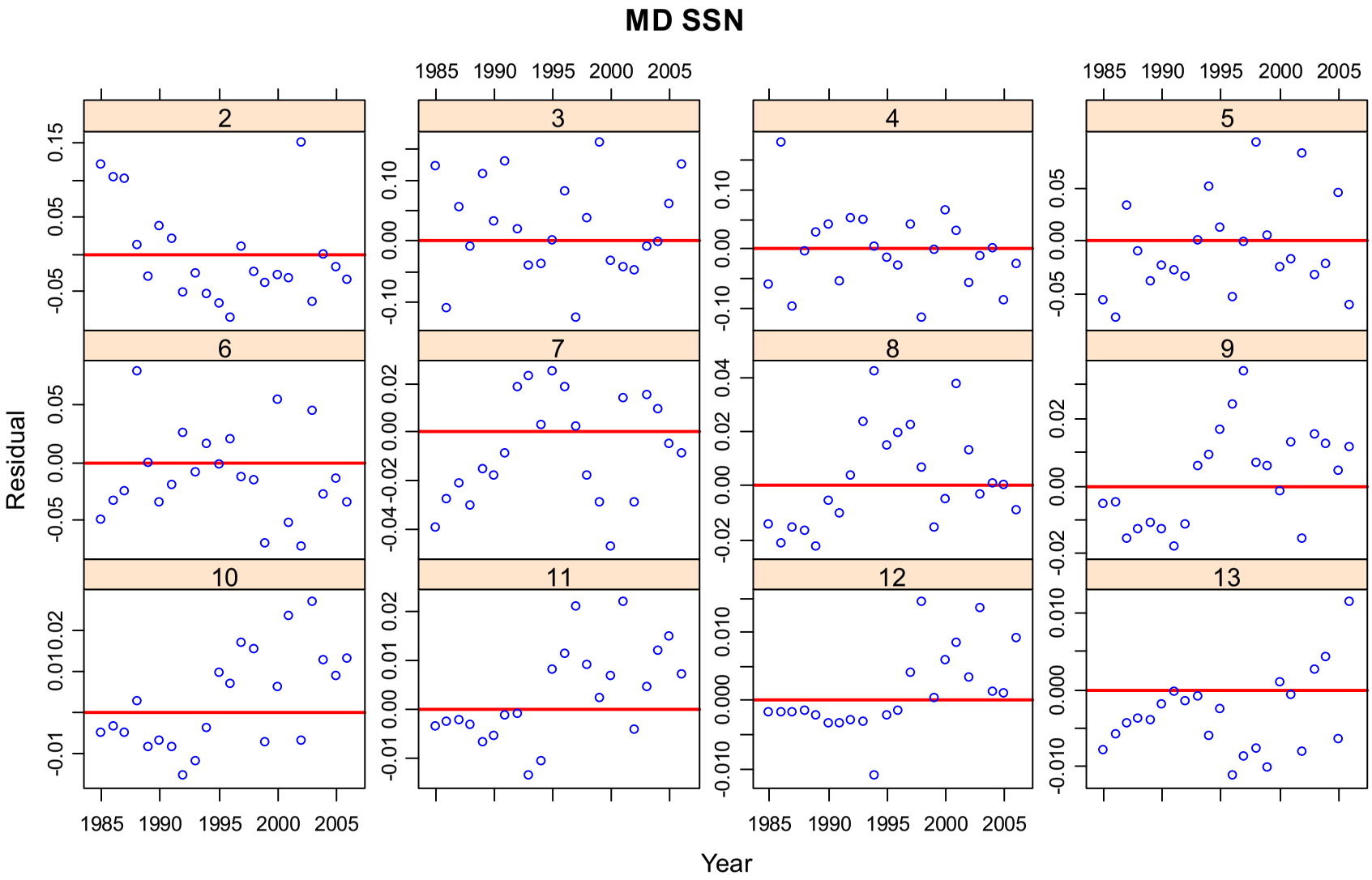

Figure 21. Residuals of proportions-at-age for each age by year for the MD SSN gillnet survey.

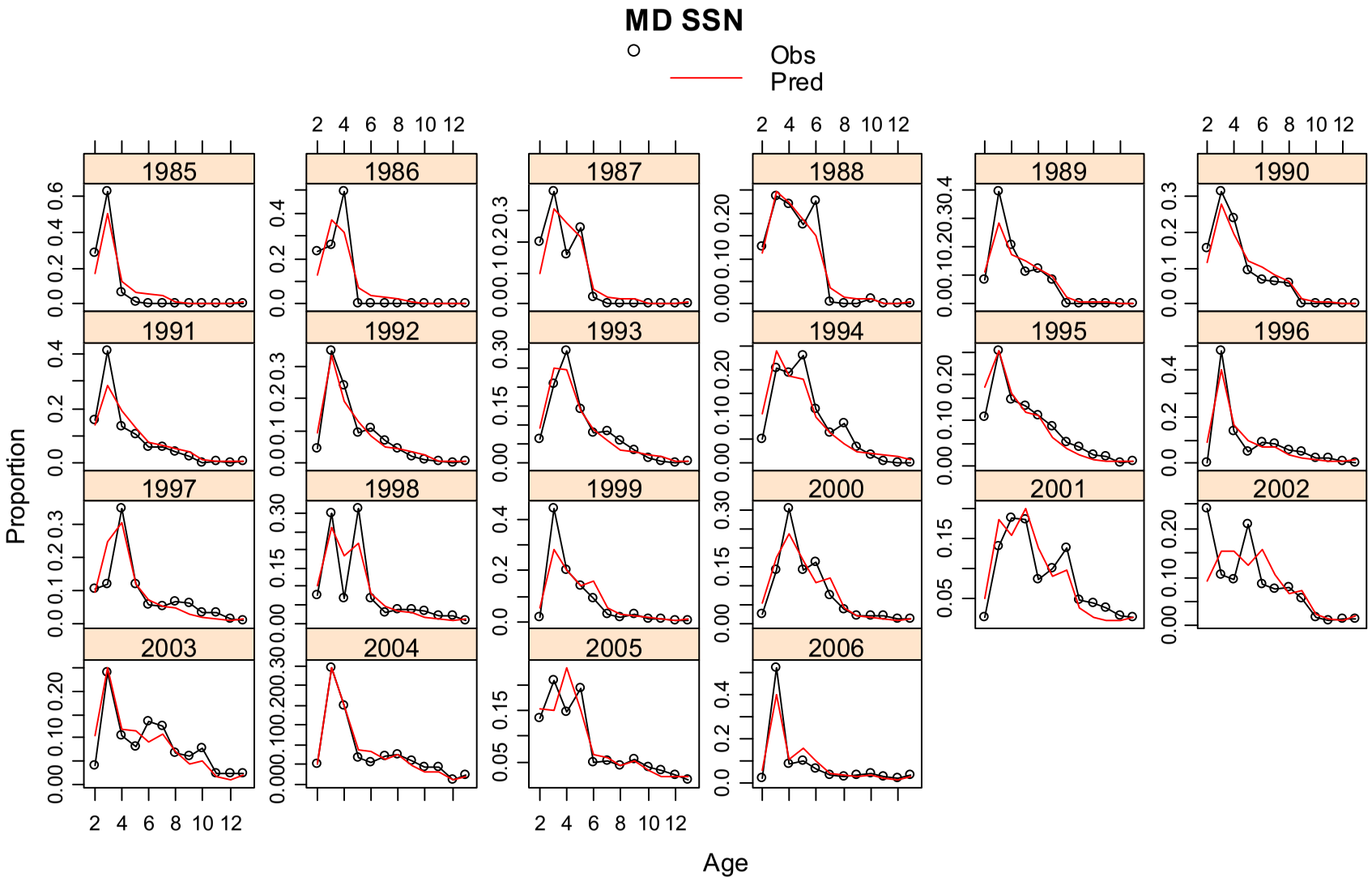

Figure 22. Observed and predicted proportions-at-age for each age by year for the MD SSN gillnet survey.

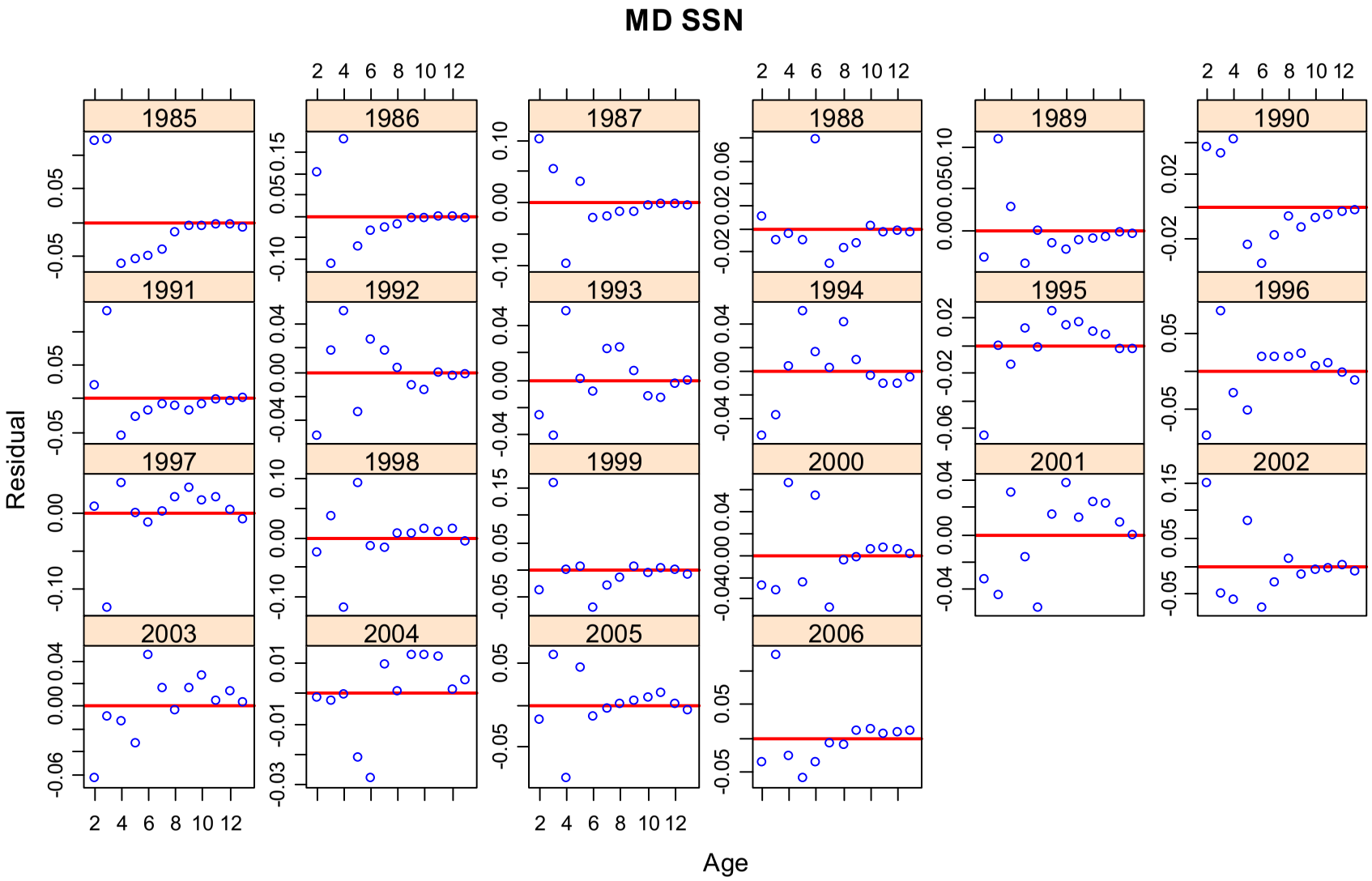

Figure 23. Residuals of proportions-at-age for each age by year for the MD SSN gillnet survey.

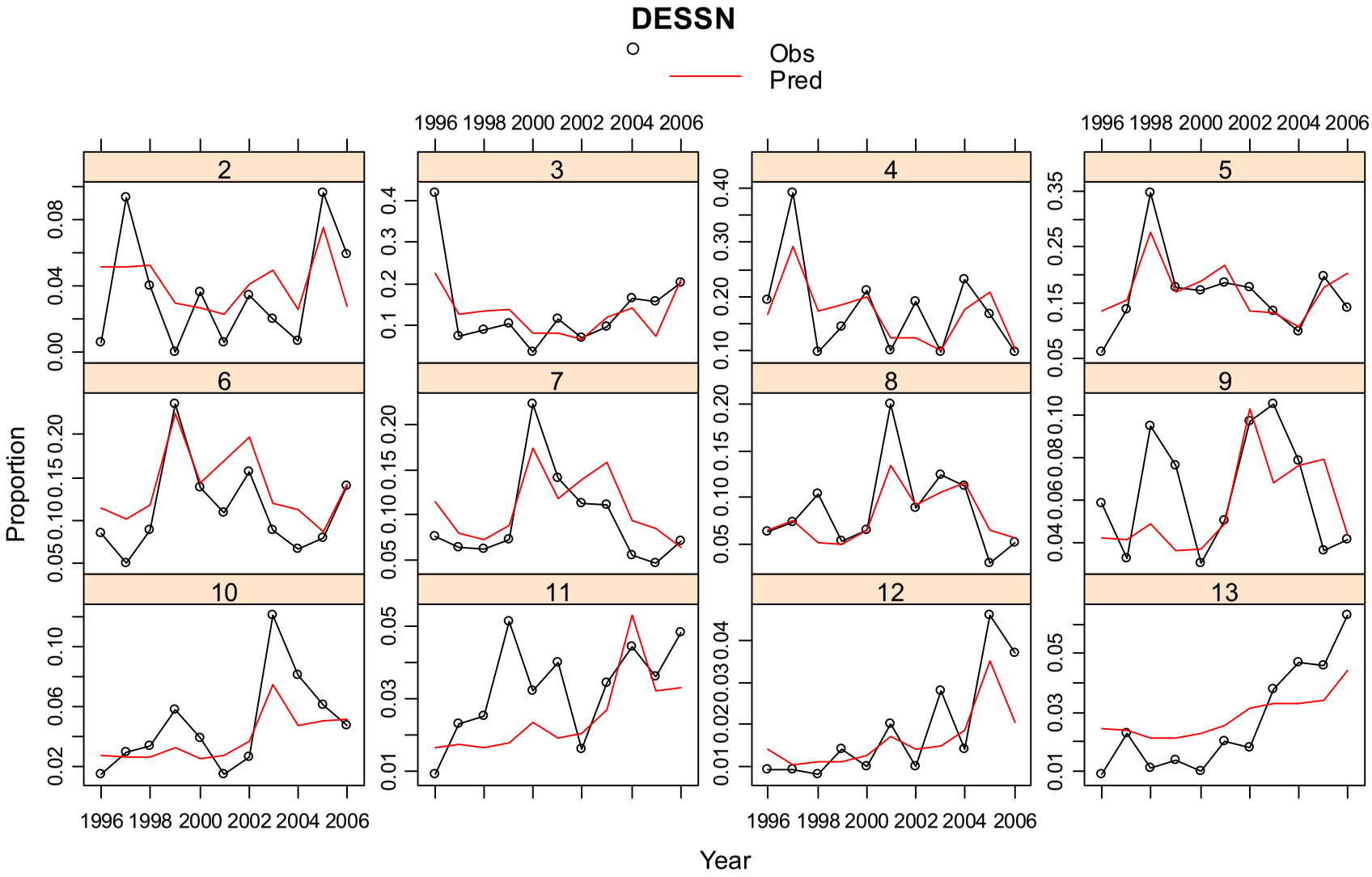

Figure 24. Observed and predicted proportions-at-age for each year by age for the DE SSN electrofishing survey.

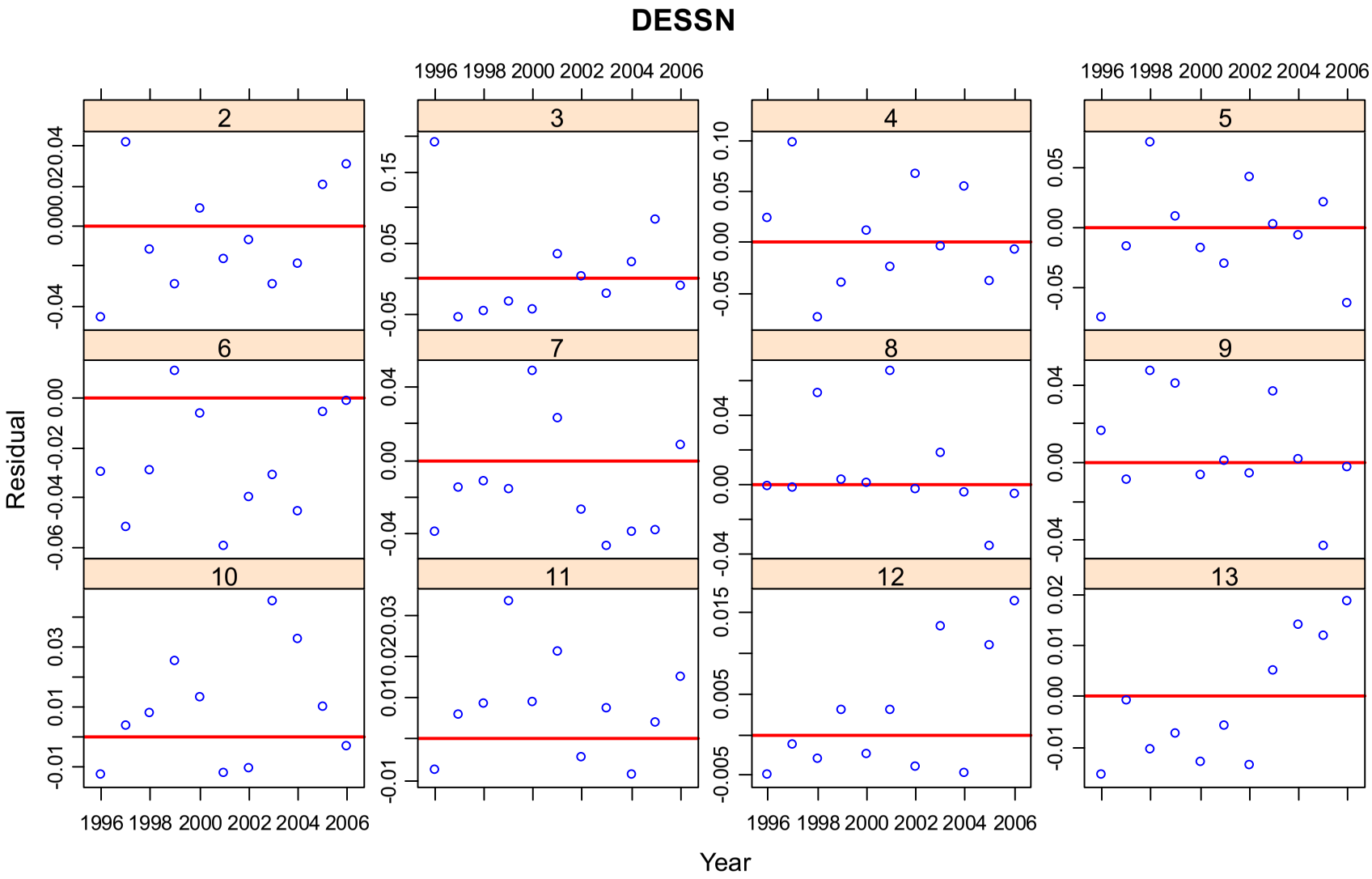

Figure 25. Residuals of proportions-at-age for each year by age for the DE SSN electrofishing survey.

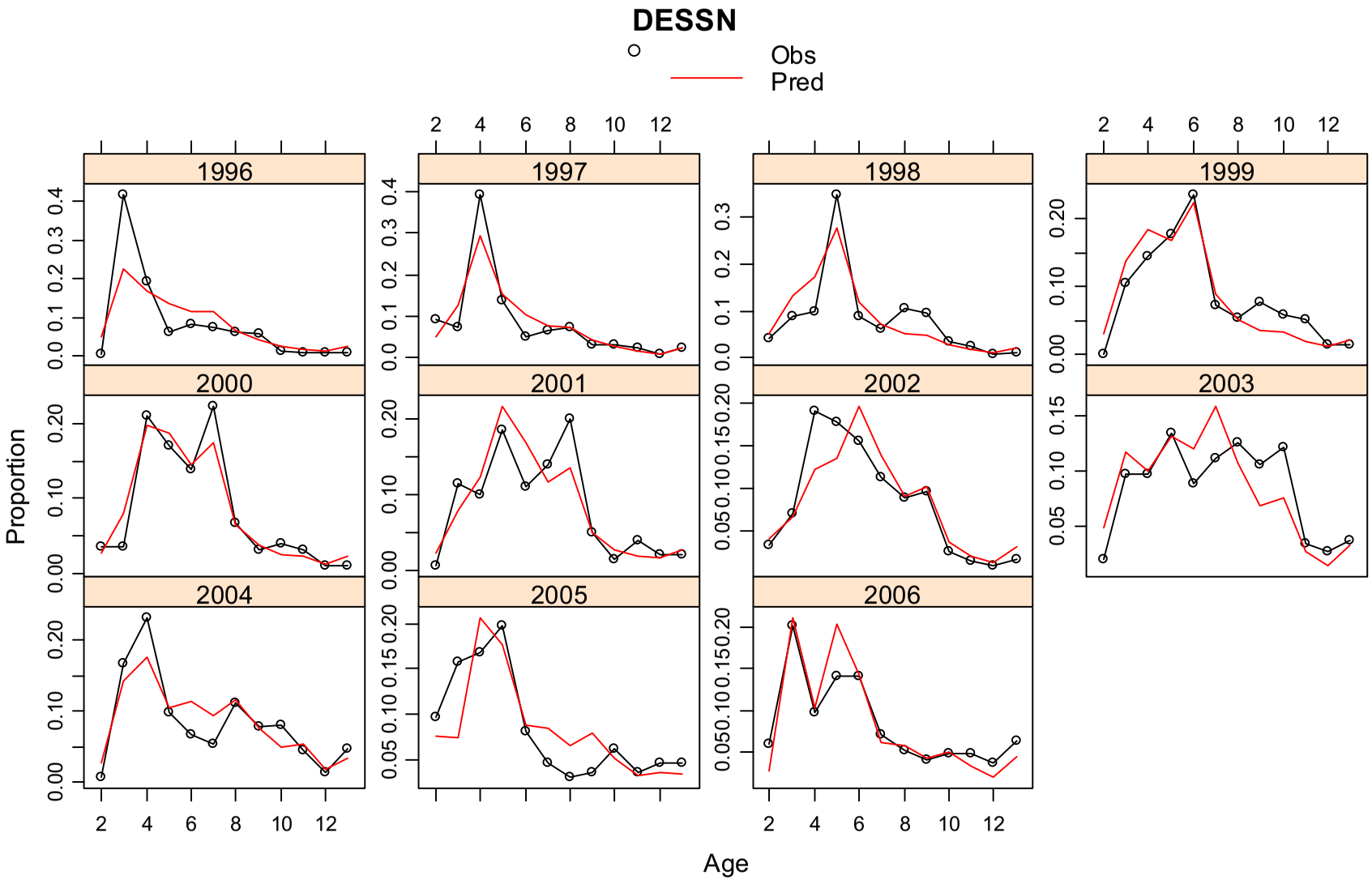

Figure 26. Observed and predicted proportions-at-age for each age by year for the DE SSN electrofishing survey.

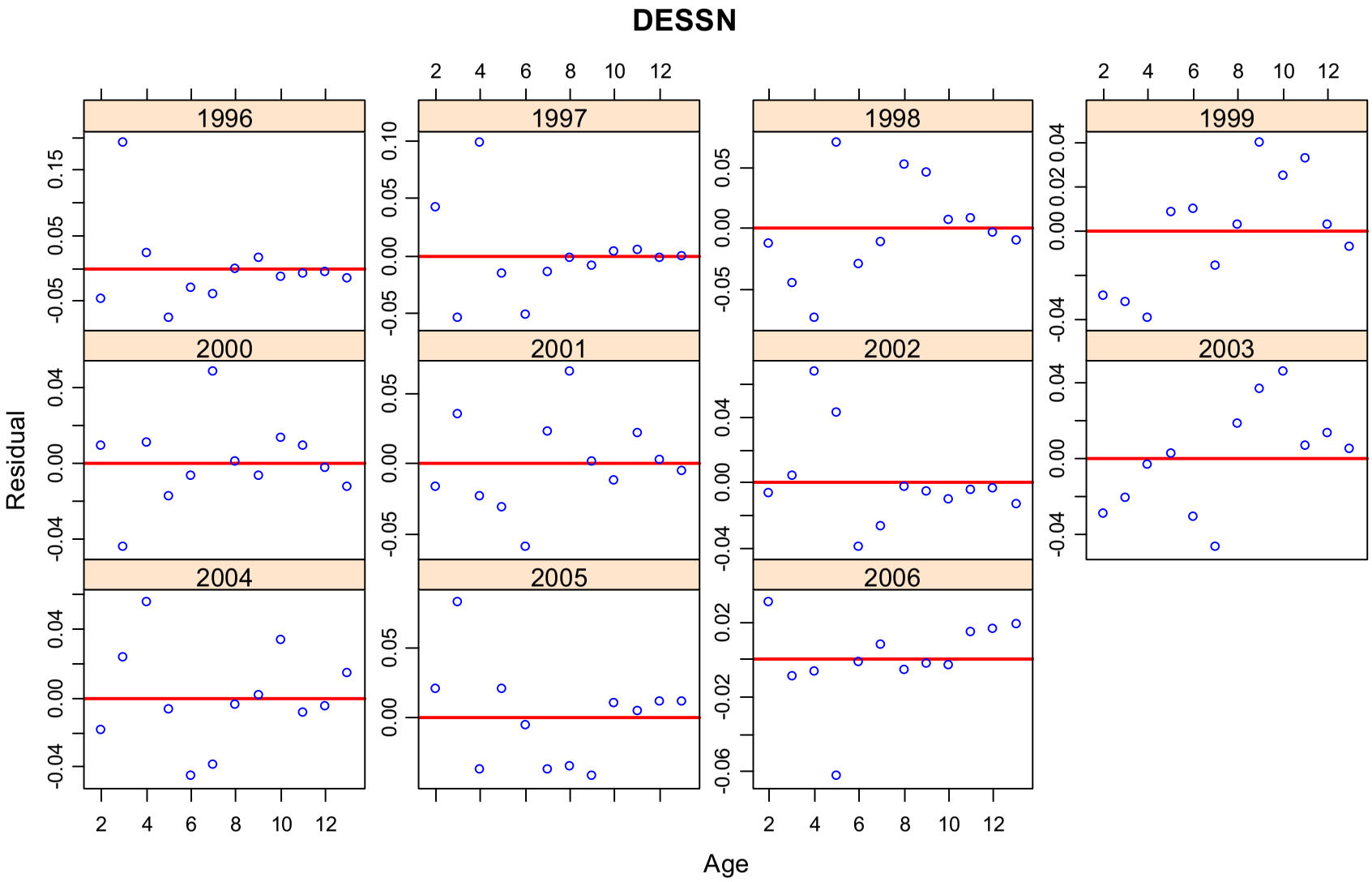

Figure 27. Residuals of proportions-at-age for each year by age for the DE SSN electrofishing survey.

Appendix A9. ADAPT Virtual Population Analysis

Catch at Age and Indices

Initial runs of ADAPT for the 2007 assessment used a combination of 62 age-specific and age aggregated fishery independent and fishery dependent indices under TOR 1 and 2. Model results indicated a significant increase in fishing mortality among 9-11 year old fish in the terminal year. The increases, particularly at age 10 from which increased from 0.5 in 2005 to 2.2 in 2006, were unrealistic and further evaluation of the chosen indices was warranted (Figure 1). Residual plots (Figure 2) showed systematic trends in residuals for some survey indices and suggests that the MD spawning stock indices for ages 3 to 9, the New York haul seine index for combined ages 9 to13, the CT trawl index and the DE trawl index should be removed from the updated analysis. Similarly, fishery dependent indices from MA commercial CPUE, MRFSS and CT recreational CPUE were also removed (the MA commercial indices failure to track strong year classes which provided additional justification for exclusion from analysis).

Model Configuration

The remaining 34 indices were used in the final run of ADAPT. Indices included the MD SSB index for ages 10-13+, NY Ocean Haul seine ages 3-8, NEFSC aggregated for ages 2-9, young-of-year (age 0) in Maryland, Virginia, New York and New Jersey, age 1 index for Maryland and Long Island, New York, DE spawning stock for ages 2-9, and aggregated for 10-13, and the NJ trawl index for ages 2-8 and aggregated for 9-13. The ADAPT run used the following input options: full F in terminal year was calculated using an averaging method; F at oldest true age for all years, including terminal year was calculated using Heincke's method and ages 8 through 11 were used to calculate the oldest true age. Plus group abundance was calculated using the backward method and the model assumed a flat topped partial recruitment. Natural mortality was fixed at M=0.15. In past assessments, an iterative re-weighting of the survey indices was applied to the model. Generally the result was an improvement in the CVs at age and the overall standard deviation. In the current model configuration, the CVs and standard deviation was better without re-weighting. Consequently the re-weighting is turned off and all indices given equal weighting.

Partial Recruitment Vector

A flat top partial recruitment vector was assumed for the ADAPT model. Initial PR values were calculated using the three year geometric mean fishing mortality for each age from the previous ADAPT model scaled to the highest value of F among all ages.

Bootstrap

The model was bootstrapped 1000 times to produce a distribution of F, SSB and abundance in the terminal year.