BERING SEA POLLOCK RECRUITMENT. ABUNDANCE DISTRIBUTION AND APPROACH TO FISHERY MANAGEMENT UNDER CHANGING ENVIRONMENT

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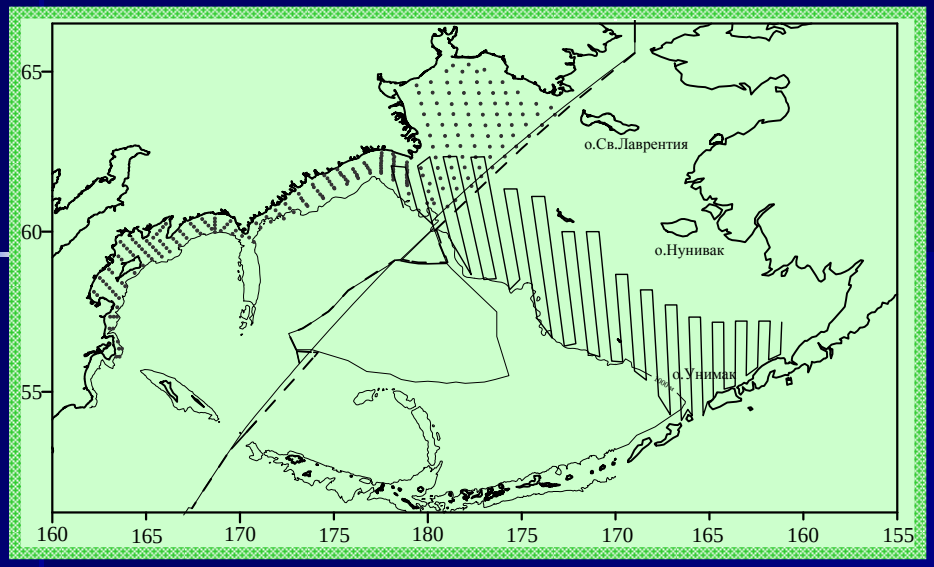
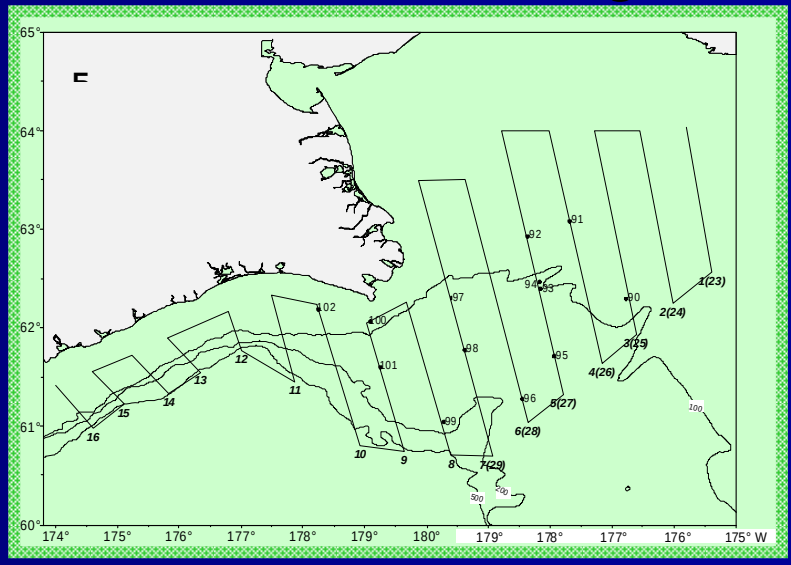
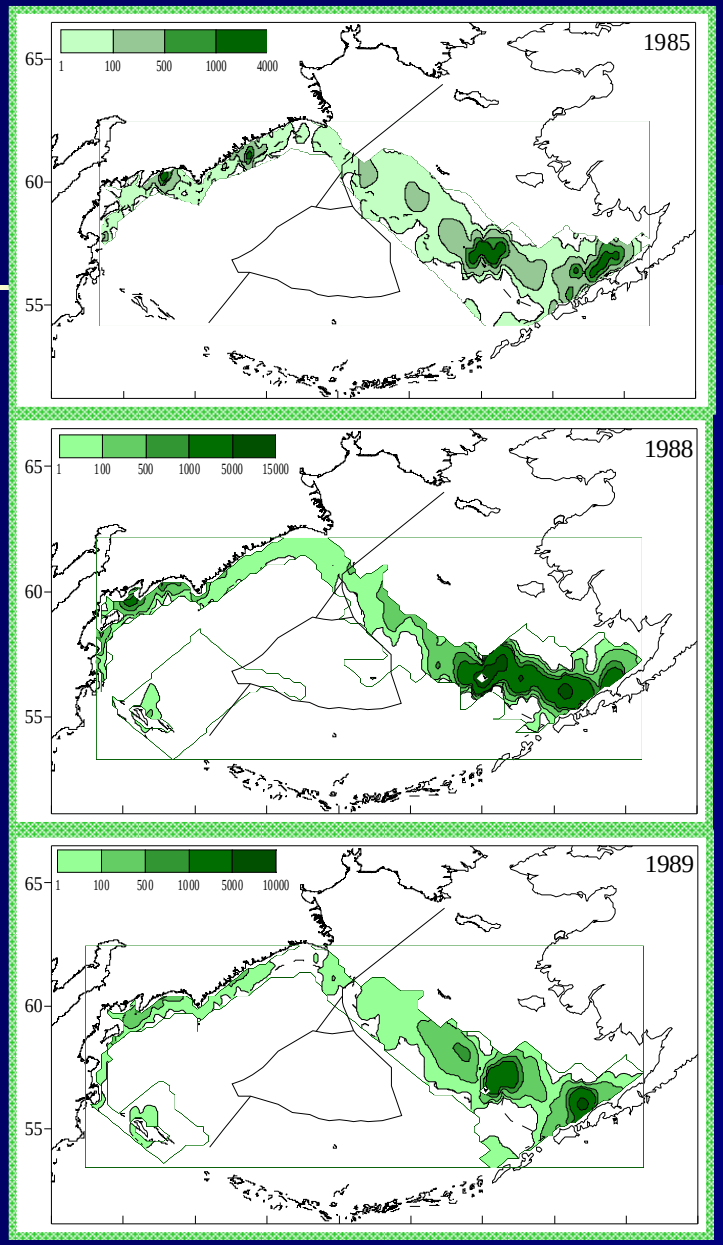
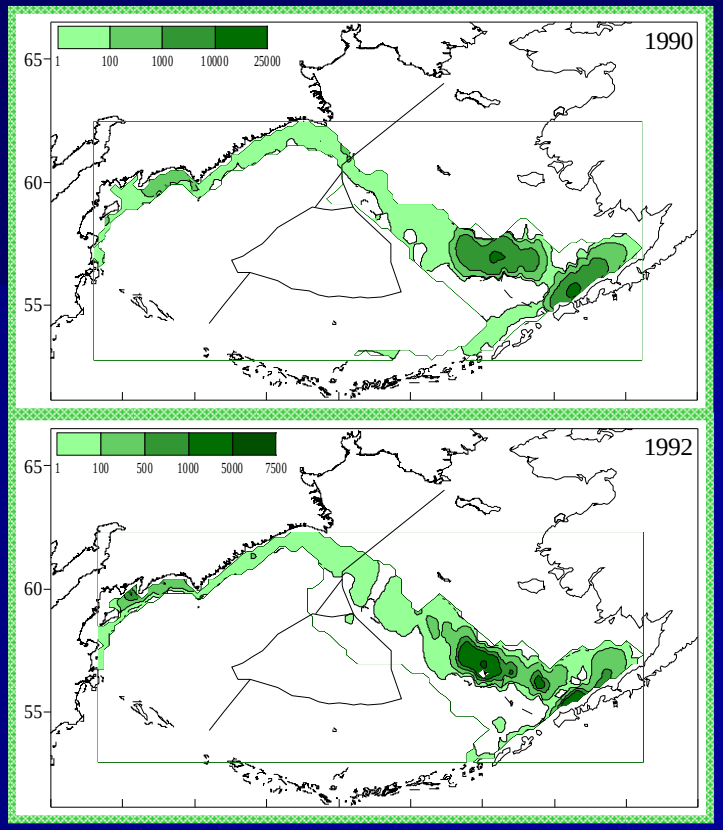


- Fig. 1. Bottom trawl survey station locations in the northwestern Bering Sea (TINRO-center) and EI MWT survey (AFSC) tracklines in the eastern and northwestern Bering Sea



- Fig. 2. EI MWT survey (TINRO-center) tracklines in the northwestern Bering Sea





- Fig. 3. Pollock eggs (I–IV stages) distribution in the Bering Sea in 1985-1992, number/sq. mile. The 200 m depth contour line is indicated as dotted line

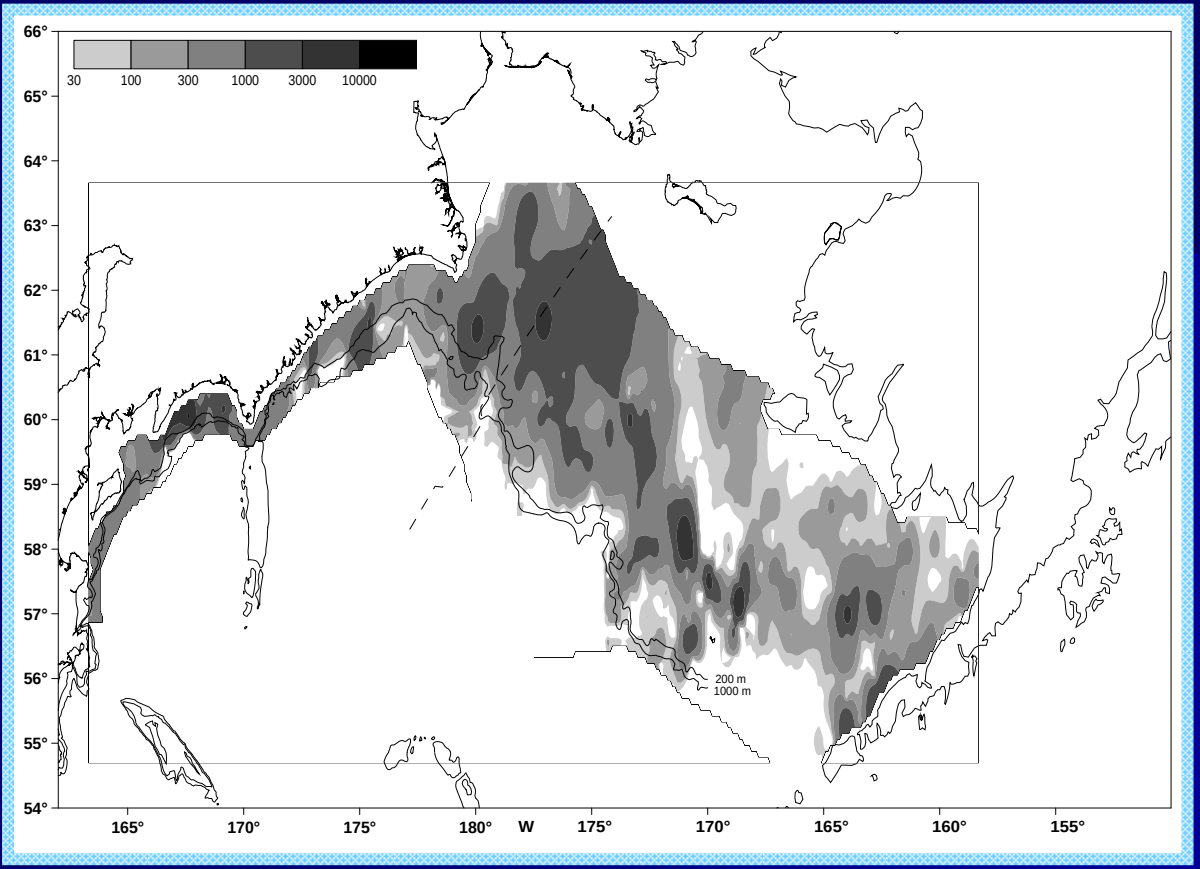
1985, April 22 – May 31

1988, April 11 – May 26

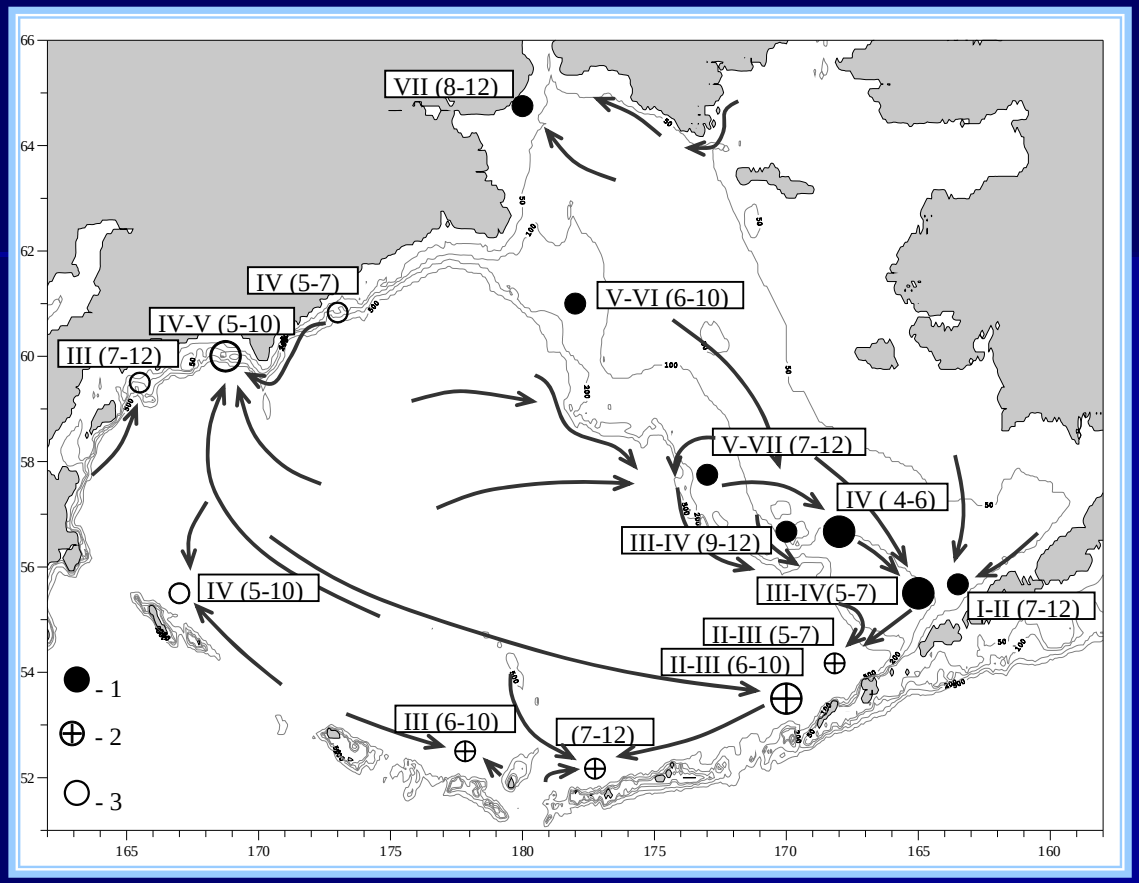
1989, April 11 – May 22

1990, April 07 – June 05

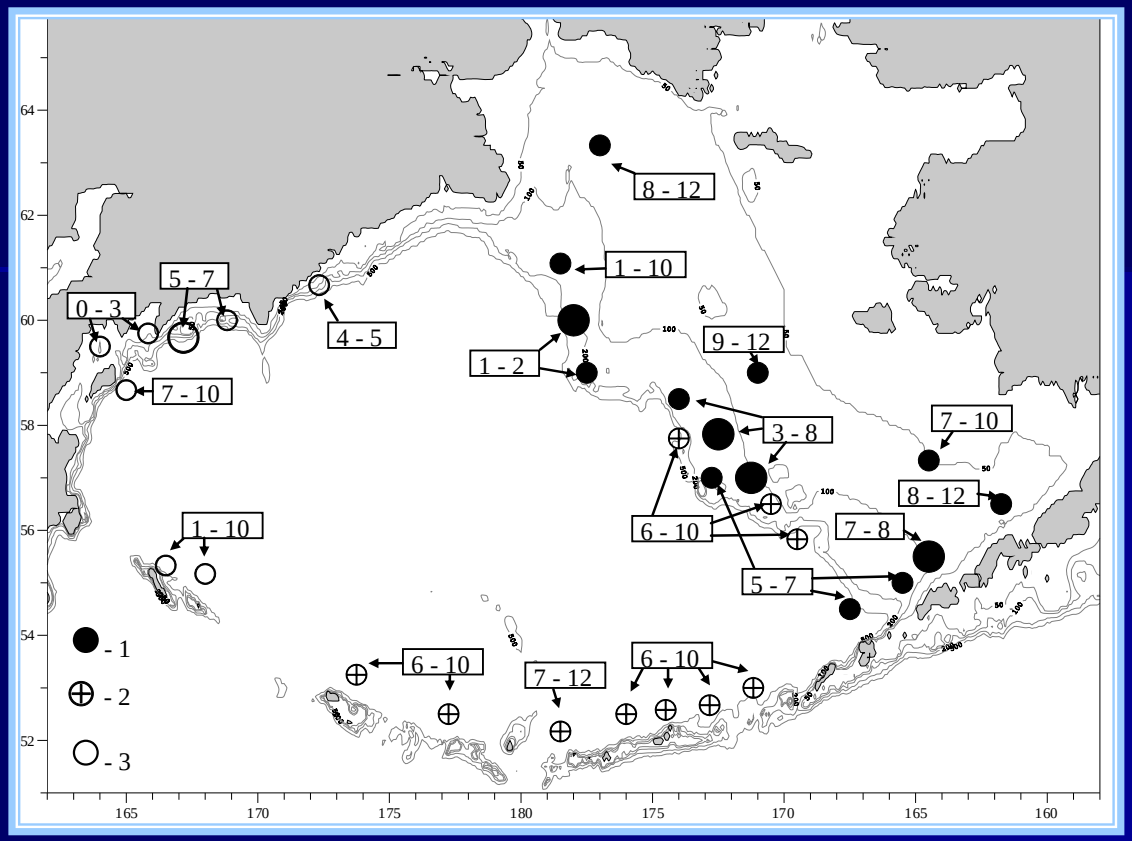
1992, April 13 – May 27



- Fig. 4. Walleye pollock regular distribution (fish/0.5 hour tow) in the Bering Sea in summer-autumn period



- Fig. 5. Distribution of spawning concentrations and general direction of prespawning migrations of the Bering Sea pollock (1 - eastern and northwestern Bering Sea , 2 - area off Aleutian Islands, 3 - western Bering Sea). Months of most intensive spawning indicated by Roman numerals and range of predominant ages of spawning pollock by Arabic numerals. Diameter of the circles reflects relative density of spawning concentrations



- Fig. 6. Locations of winter concentrations of the Bering Sea pollock (1 - eastern and northwestern Bering Sea, 2 - area off Aleutian Islands, 3 - western Bering Sea). The range of dominant pollock ages is indicated by Arabic numerals. Diameter of circles reflects relative density of winter concentrations

Fig. 7. Pollock distribution in the Bering Sea, summer-autumn period, 1987

- *А – pollock length 21-40 см,*
- *Б – pollock length 41-60 см,*
- *В – pollock length > 60 см*

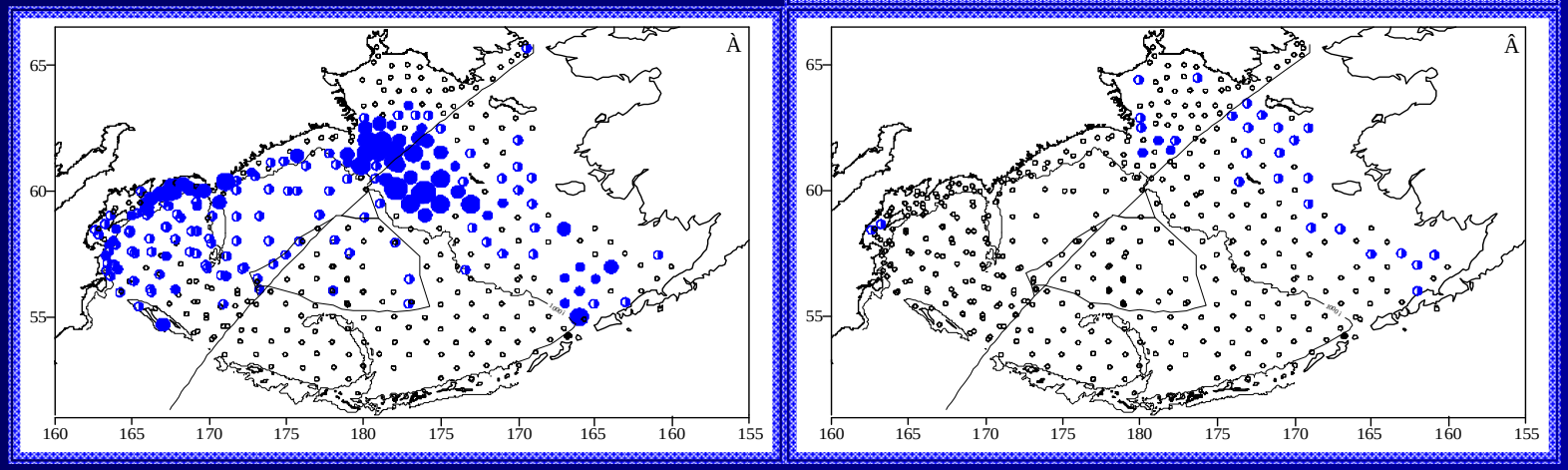
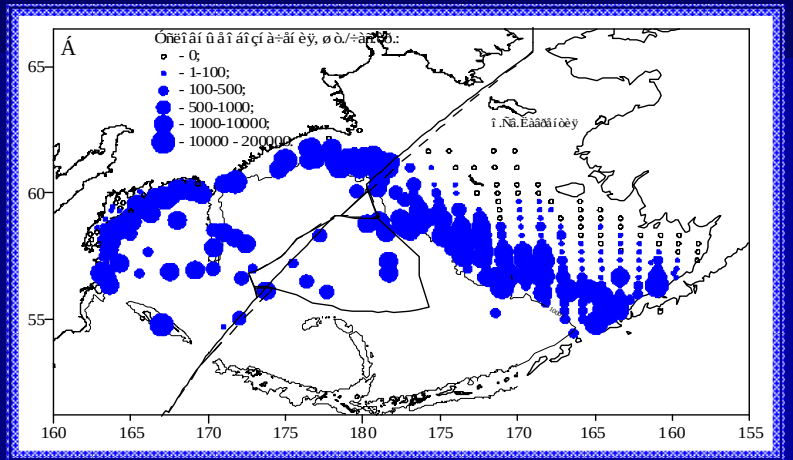
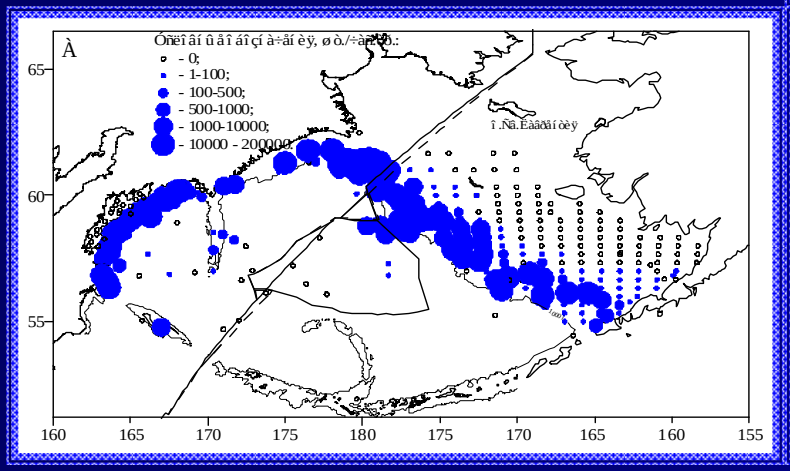


Fig. 8. Pollock distribution in the Bering Sea in spring-autumn period, 1988

- *А – pollock length 25-40 см,*
- *Б – pollock length 41-60 см,*
- *В – pollock length > 60 см*





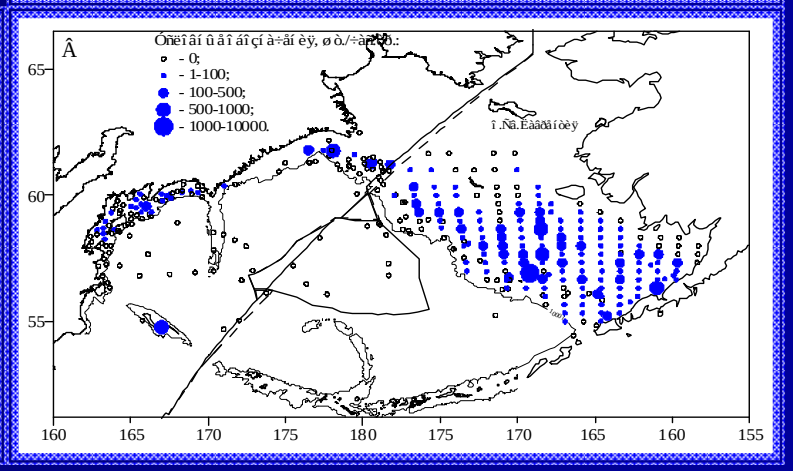


Fig. 9. Distribution of pollock in the Bering Sea midwater in summer-autumn, 1999
А) Pollock length < 20 см; Б) 21-40 см; В) 41-60 см; Г) > 60 см

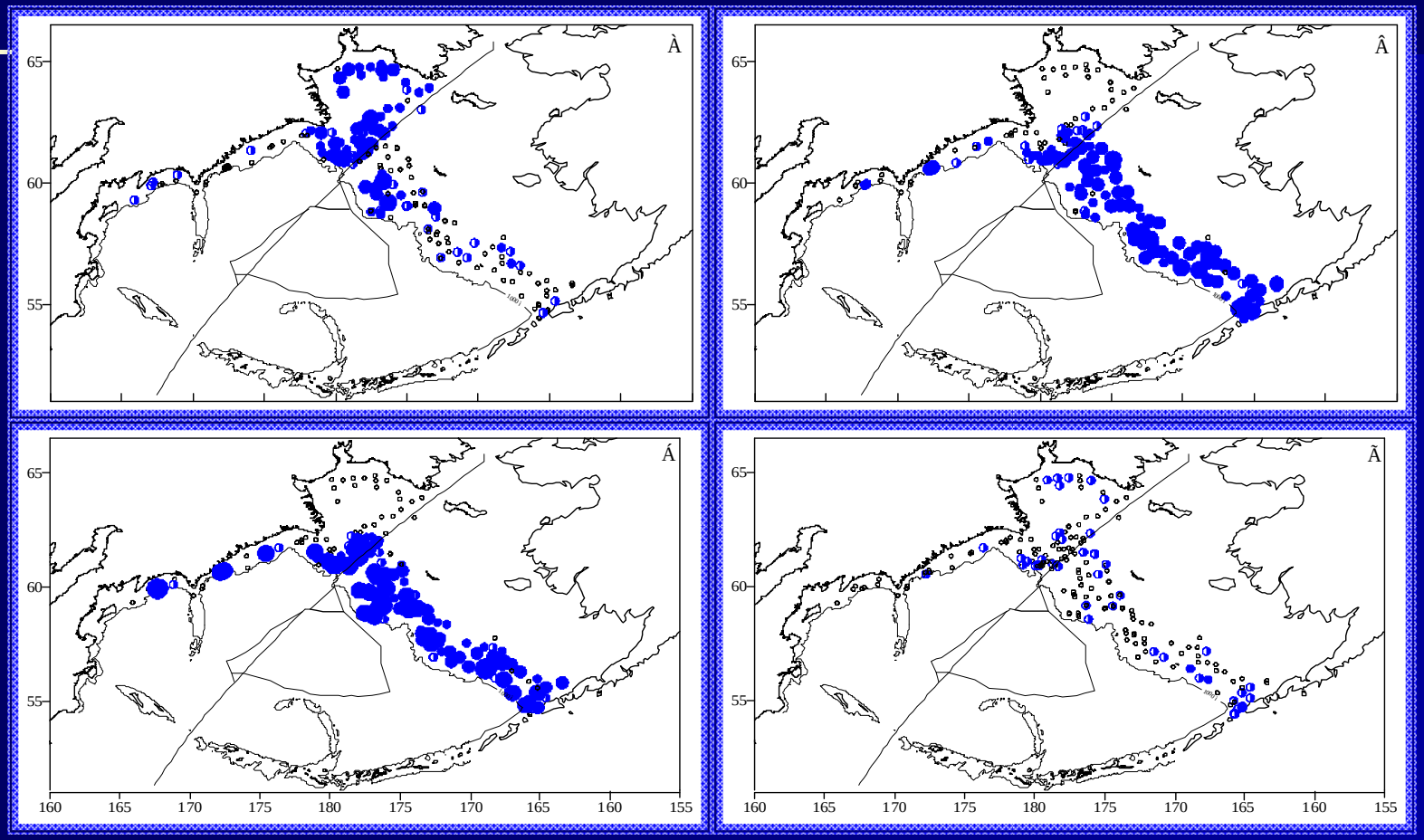
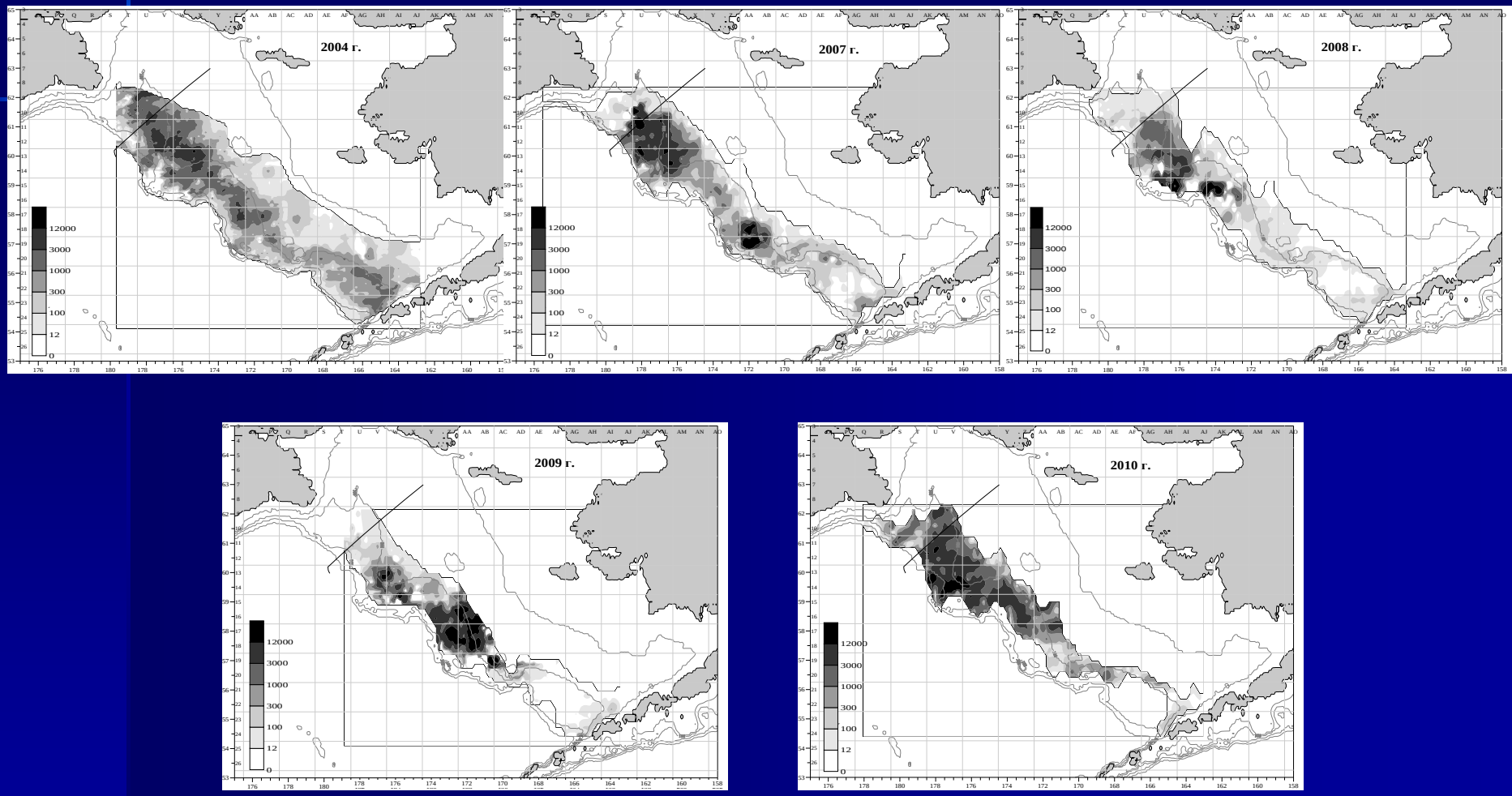
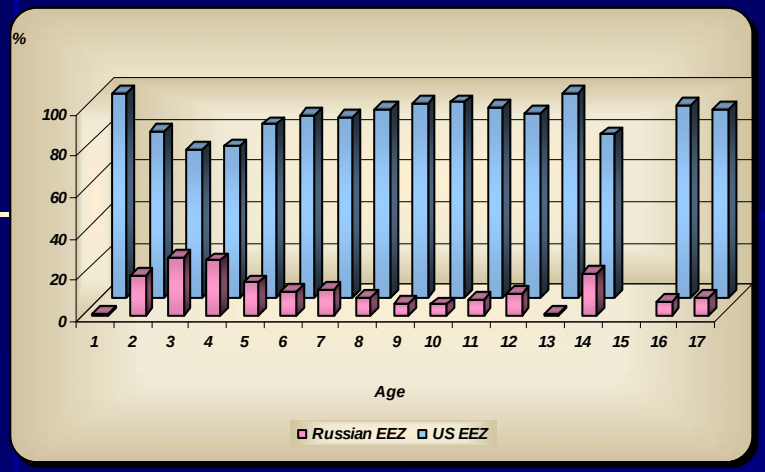
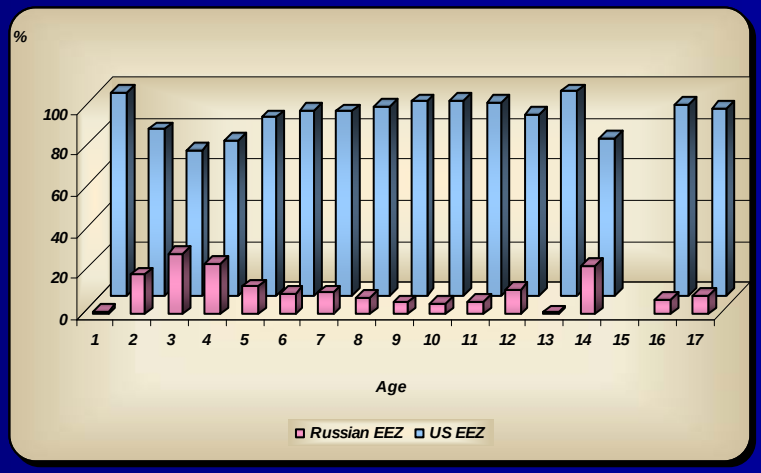


Fig. 10. Pollock distribution in the eastern and northwestern Bering Sea in summer period, 2004, 2007-2010 гг.





- Fig. 11. Comparative pollock abundance by age in the northwestern (Russian EEZ) and eastern (US EEZ) Bering Sea in summer – autumn in 1990-s



- Fig. 12.Comparative pollock biomass by age in the northwestern (Russian EEZ) and eastern (US EEZ) Bering Sea in summer – autumn in 1990-s

- Fig. 13. Walleye pollock age composition in the eastern and northwestern Bering Sea (a – midwater, b – off bottom) in summer-autumn, 2010

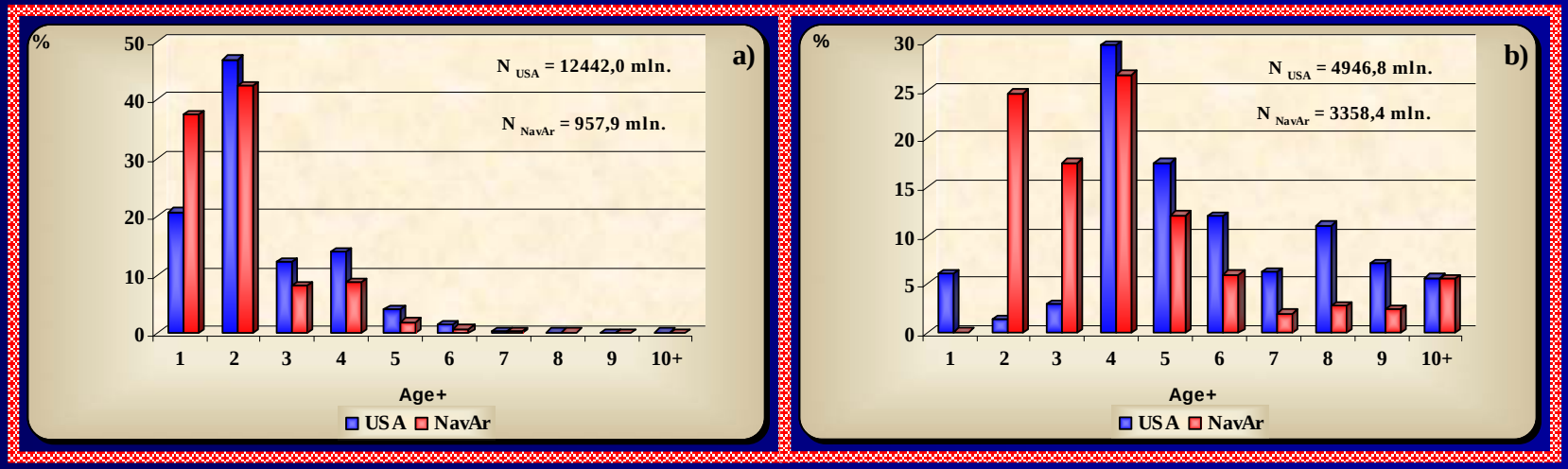
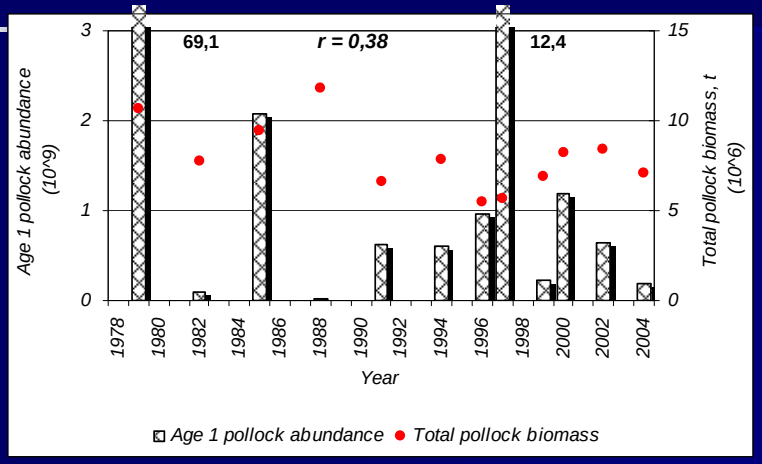
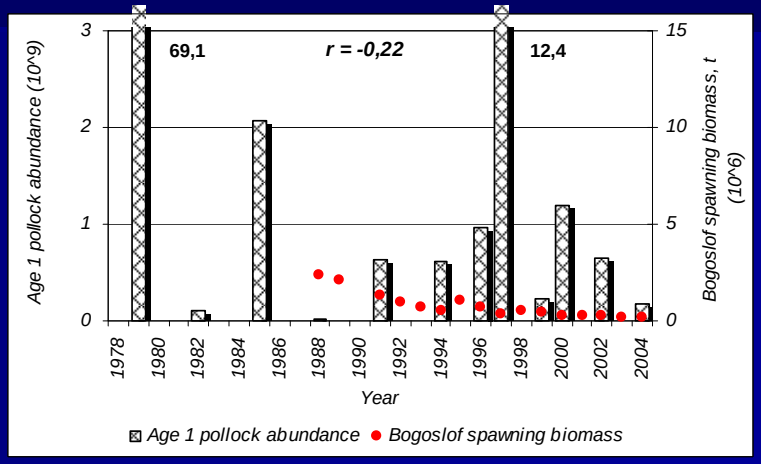
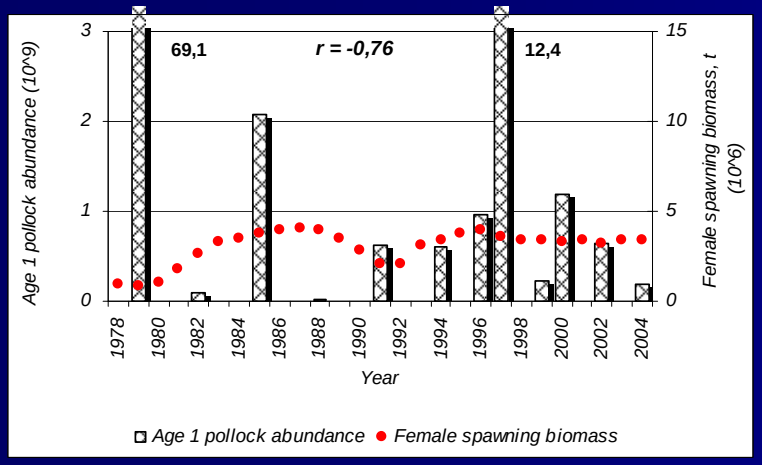
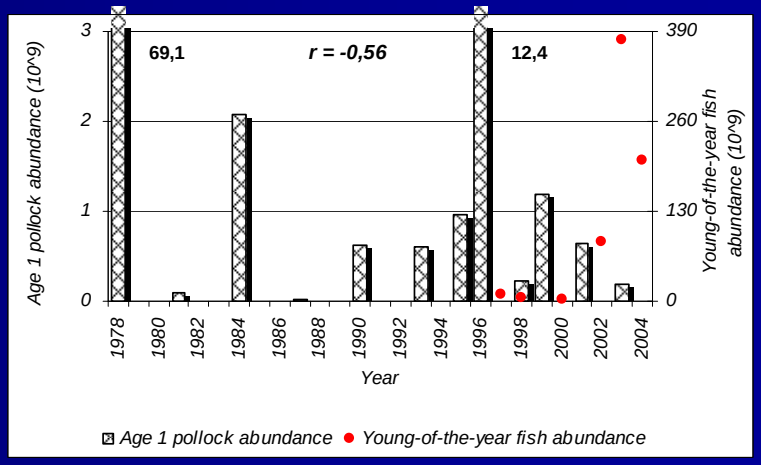


Fig. 14. The Bering Sea pollock year-classes strength relative to population biomass (a), female spawning biomass (b), Bogoslof spawning biomass (c), young-of-the-year fish abundance(d).









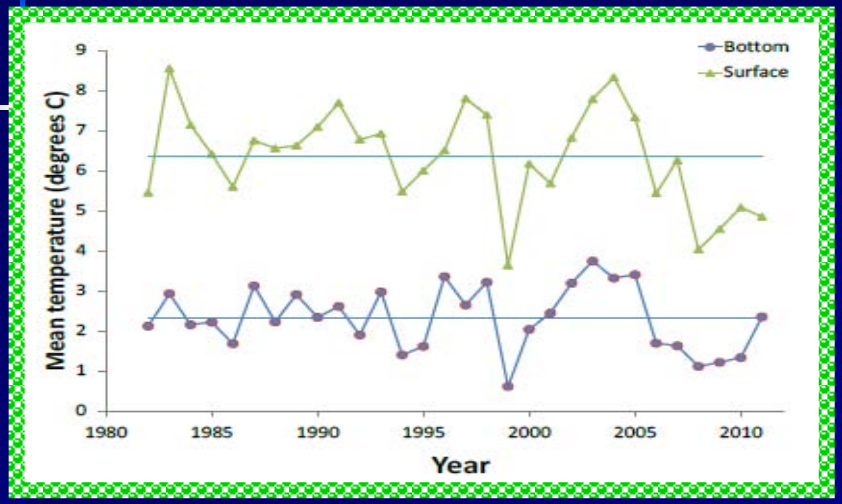


Fig. 15. Area-weighted bottom (lower lines) and surface (upper lines) temperatures for the Bering Sea during the NMFS summer botom-trawl surveys (1982-2011).

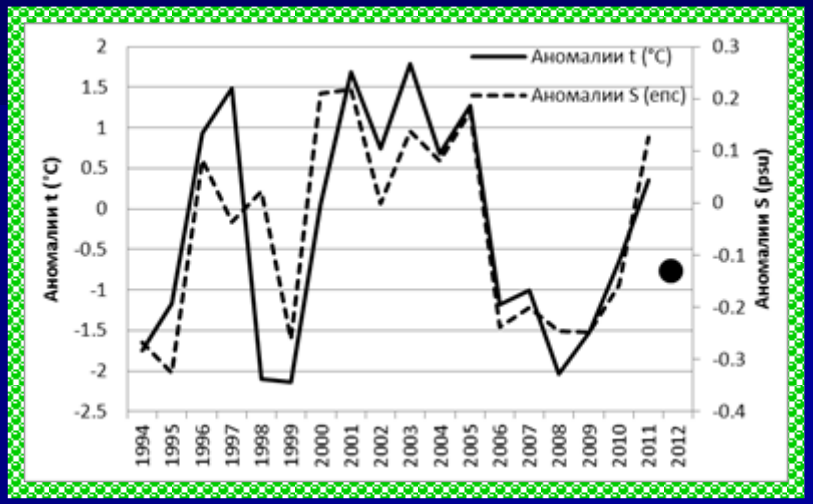
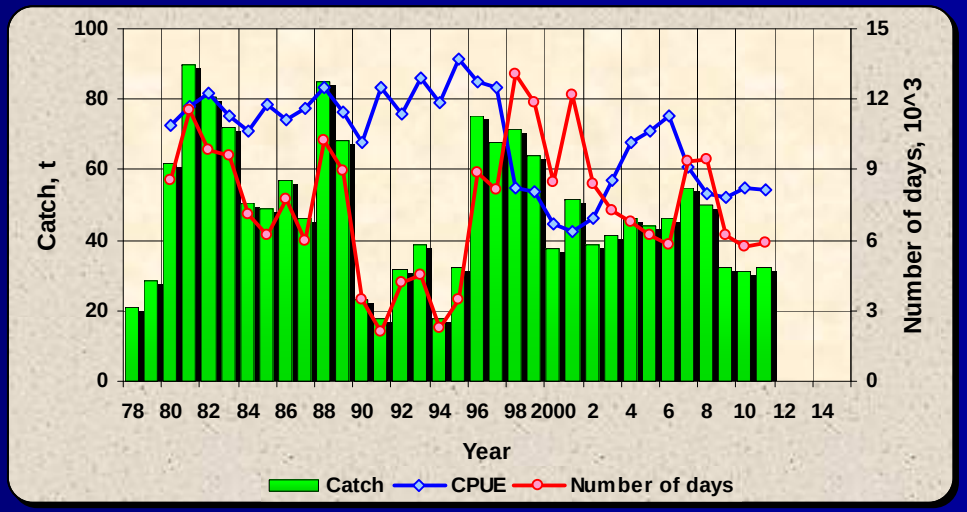


Fig. 16. Inter-annual variability of temperature and salinity anomalies in layer 50 m (bottom depth 100-200 m) in the nortwestern Bering Sea (Navarin area) in summer-autumn. Black point – expected value of anomaly in 2012

- Fig. 17. Pollock catch in the Bering Sea, 1970-2011



- Fig. 18. Pollock catch and CPUE in the northwestern Bering Sea (Navarin area), 1978-2011

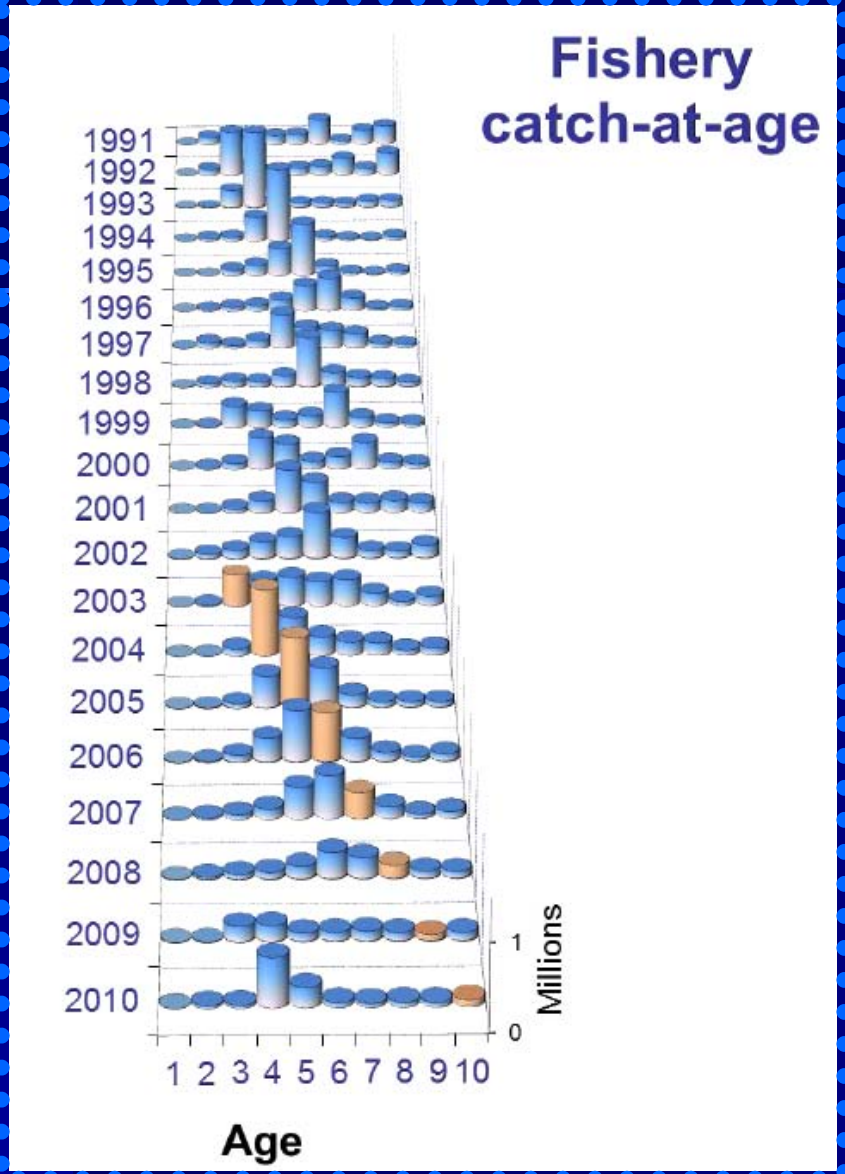


Fig. 19. Eastern Bering Sea pollock fishery estimates catch-at-age data (in number) for 1991-2010. The 2000 year-class is highlighted (AFSC data).

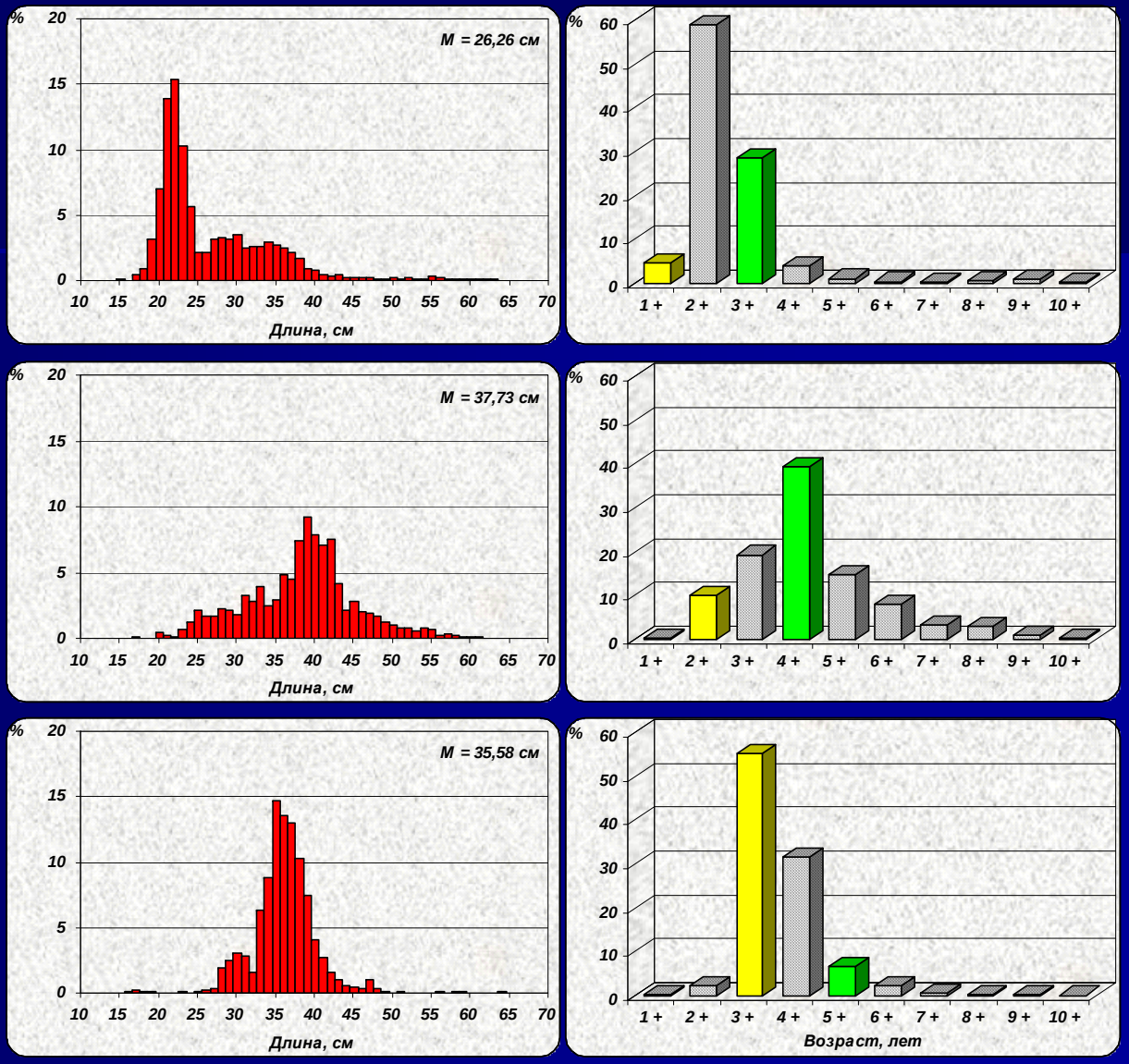
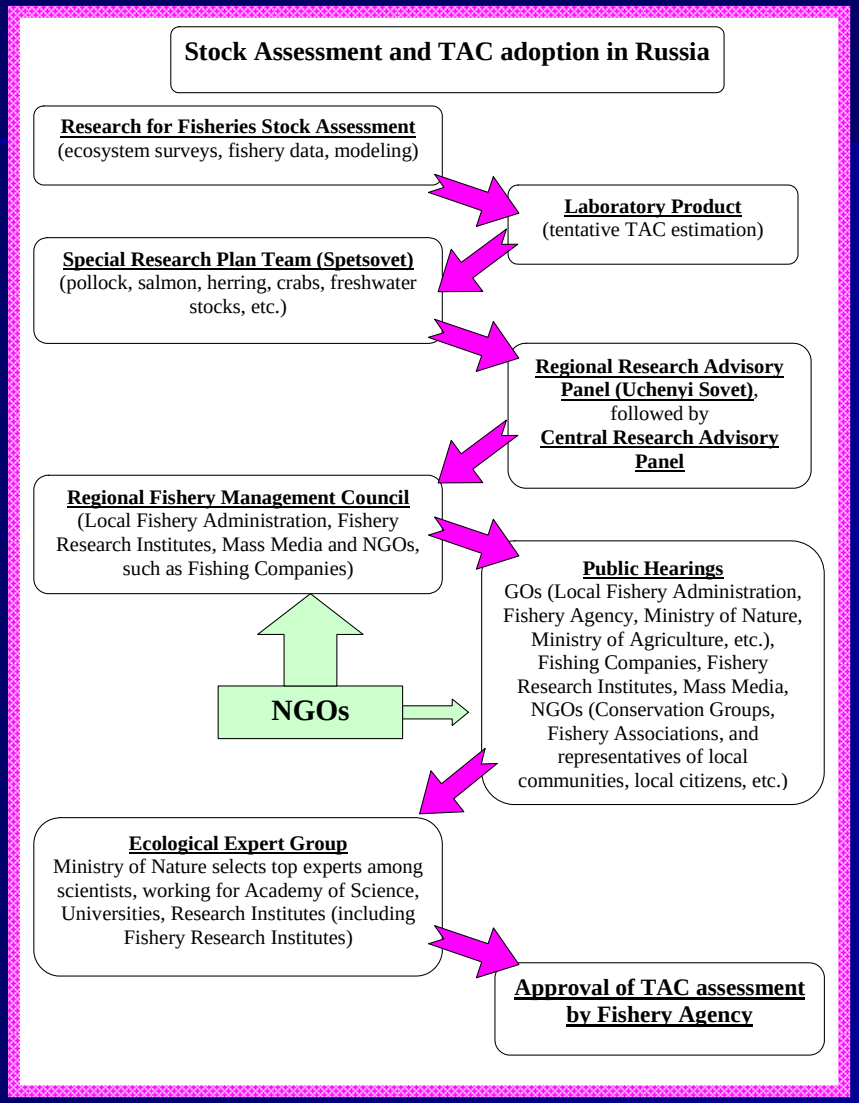


Fig. 20. Northwestern Bering Sea (Navarin area) pollock fishery catch-at-age and length data for the autumn period 2009-2011

❖ Fig. 21. Stock assessment and TAC adoption in Russia



Thank You!