

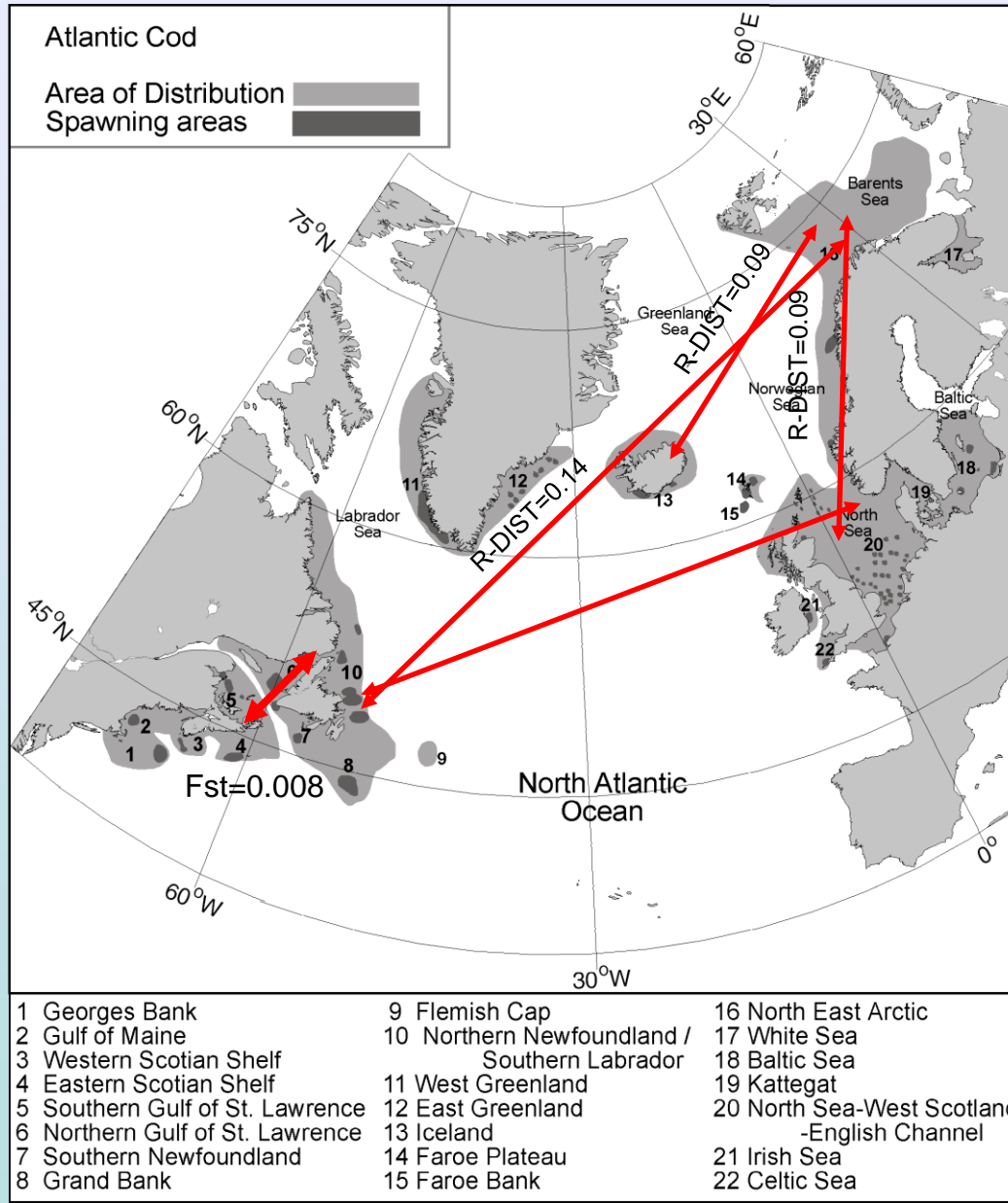
Has man learned to manage cod?



Gudrun Marteinsdottir
University of Iceland



North Atlantic cod stocks



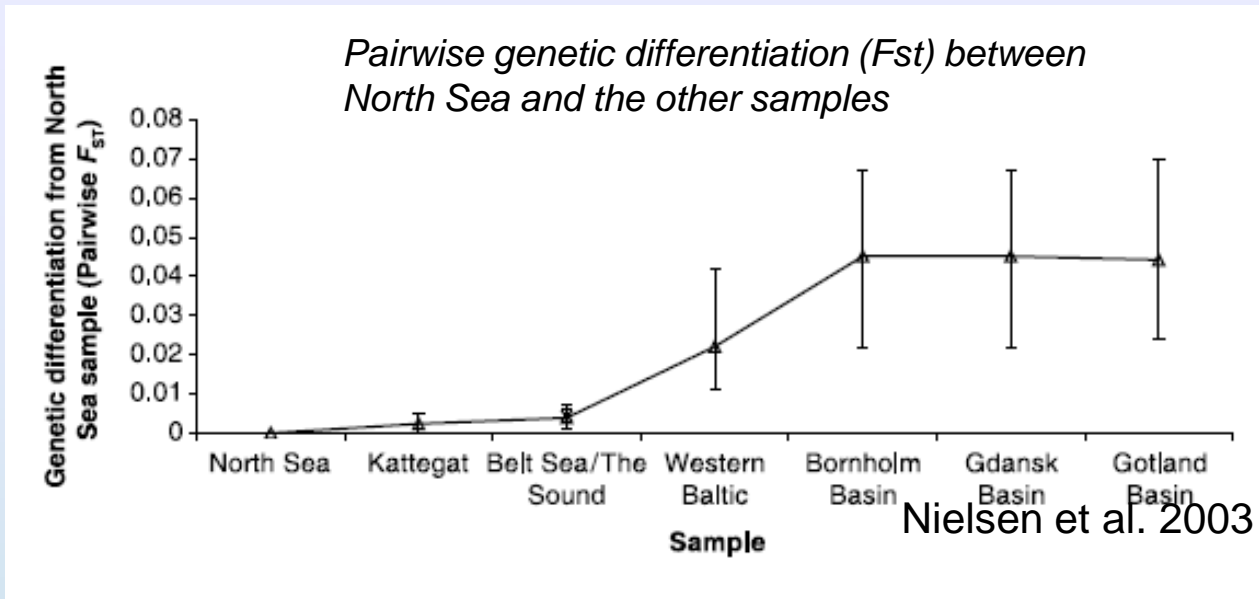
RDIST=Roger genetic distance (Pogson, 1995)

See also:
Bentzen et al 1996
Hutchinsons et al., 2001
Arnason, 2004
Galvin et al., 1995

Ruzzante et al. 1998
Beacham *et al.*, 2002

Sundby, 2000

North East Atlantic cod stocks



NAC – coastal cod – Møller, 1966; Fevolden and Pogson, 1997 – Sarvas 2005; Mork and Gjæver, 1999, Jørstad &

Nævdal 1989

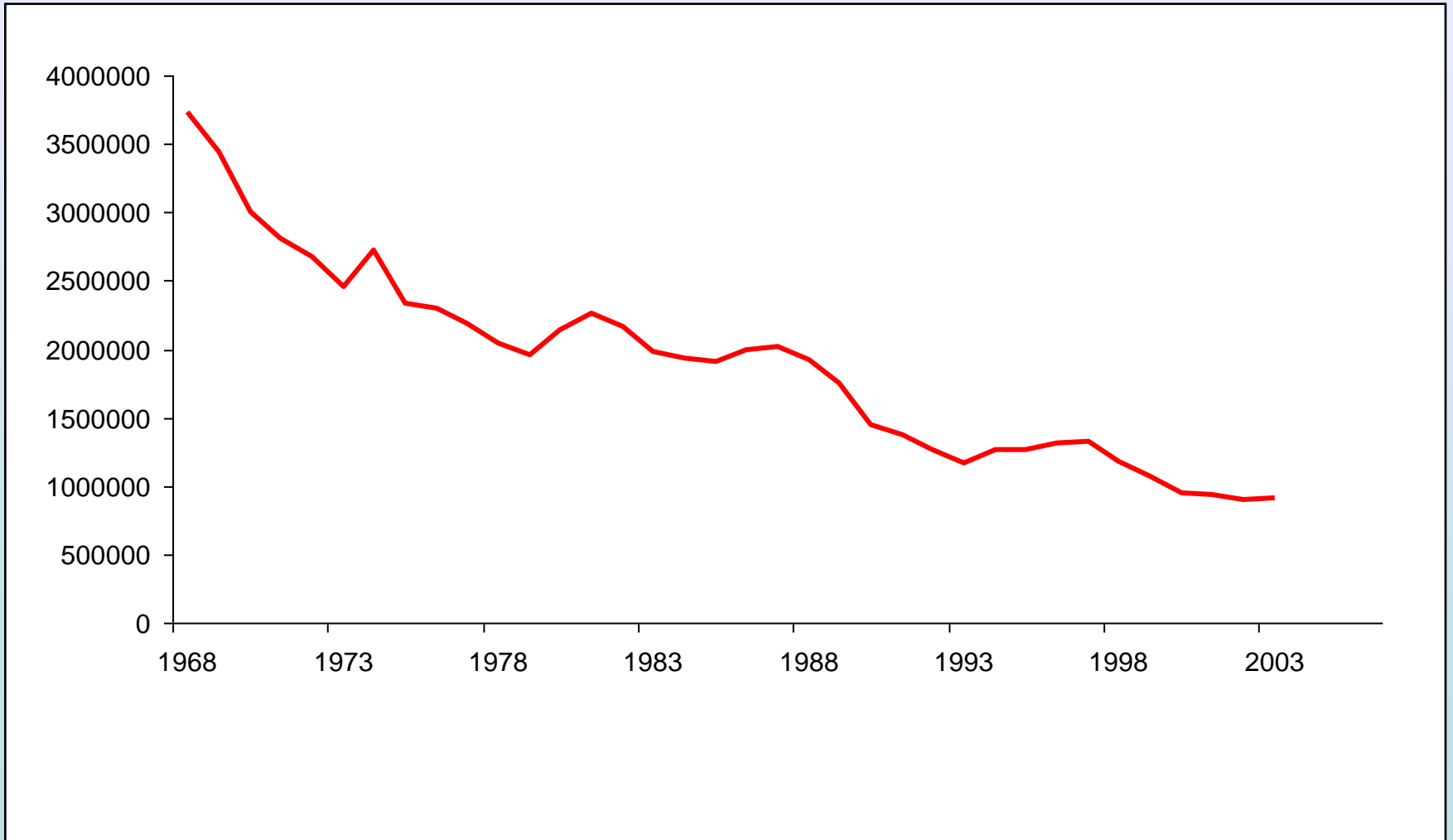
Faroe Island – Difference between Bank and Plateau. Sick, 1965; Nielsen et al. In prep.

North Sea – Differences among Bergen Bank, Moray Firth, Flamborough Headd, S. Bight
Hutchinson et al., 2001

Baltic – No differences. Sick, 1965; Nielsen et al., 2003

Iceland N vs. S – Pampoulie et al. 2006

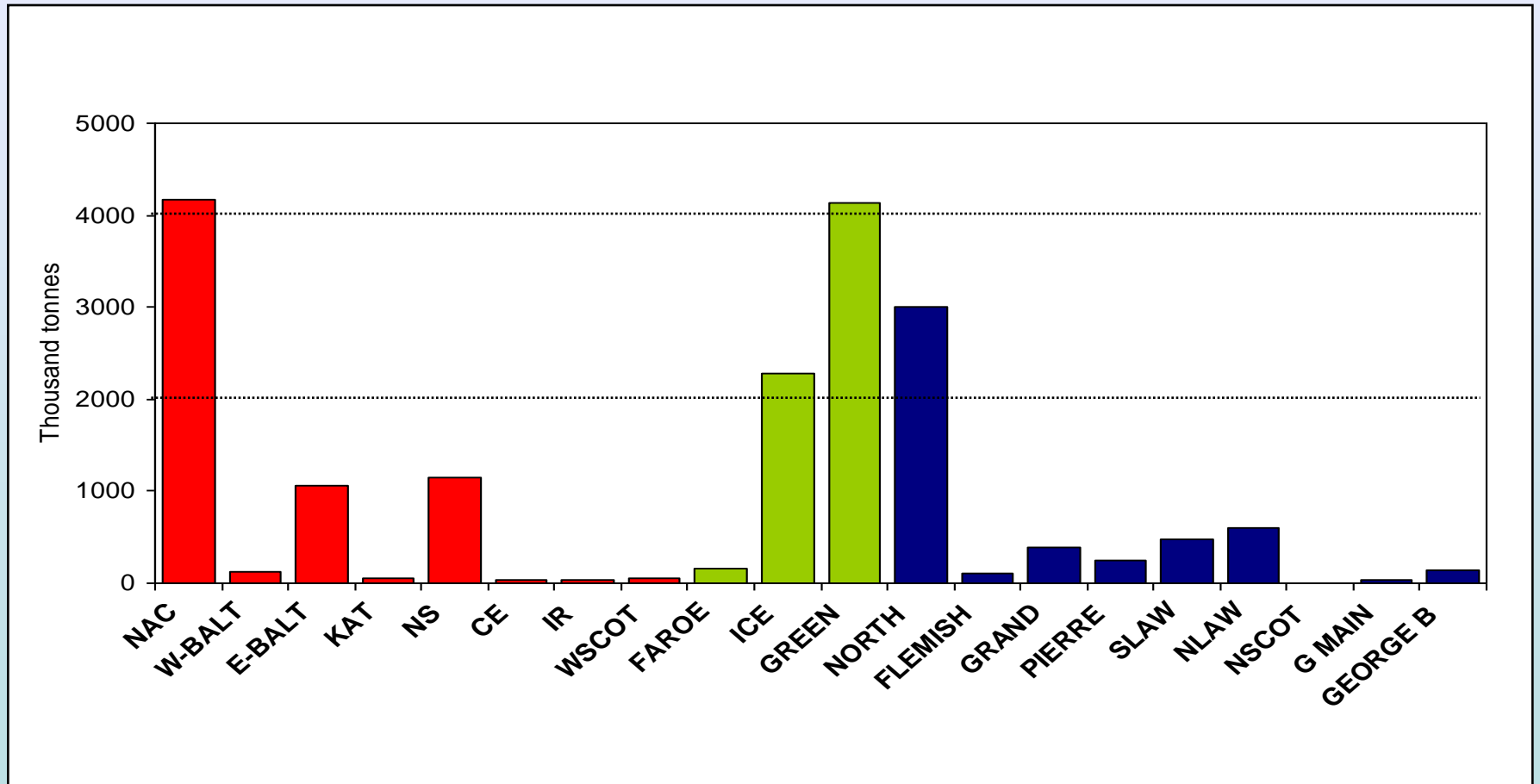
Total Catch of cod in the North Atlantic



Assesment Working Group Reports

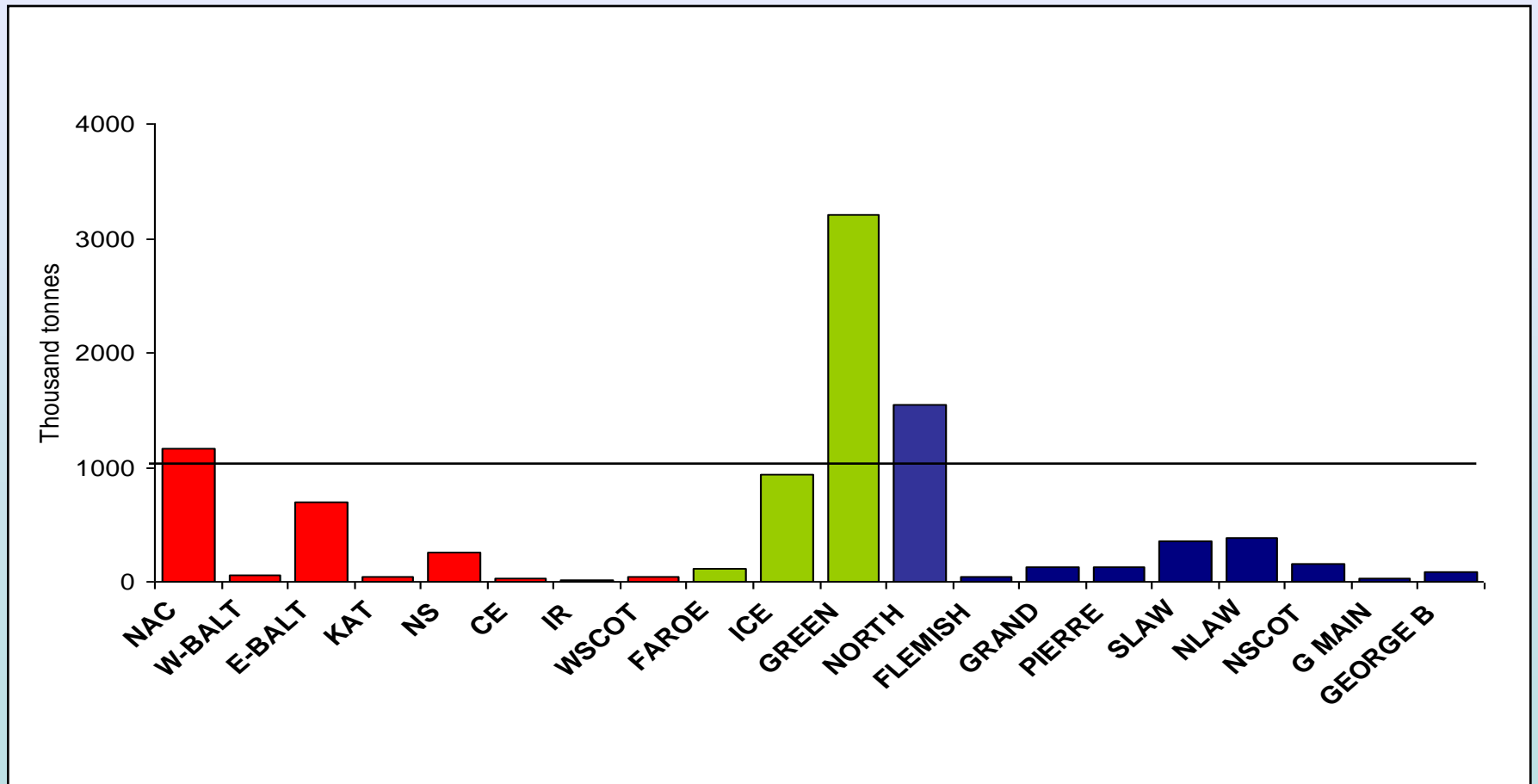
- Bratley, J., N. G. Cadigan, B. P. Healey, G. R. Lilly, E. F. Murphy, D. E. Stansbury and J.-C. Mahé. 2003. An assessment of the cod (*Gadus morhua*) stock in NAFO subdiv. 3Ps in October 2003. CSAS Research Document 2003/092.
- Cervino, S. and A. Vázquez. 2004. A survey based assessemnt of cod in division 3M. NAFO SCR Doc. 04/53
- Chouinard, G. A., and D. P. Swain, L. Currie, G. Poirier, A. Rondeau, H. Benoit, T. Hurlbut, D. Daigle. 2003. Assessment of the cod in the southern Gulf of St. Lawrence, February 2003. CSAS Research Document 2003/015.
- Fanning, L.P., R. K. Mohn and W. J. MacEachern. 2003. Assessment of 4VsW cod to 2002. CSAS Research Document 2003/027
- Fréchet, A., J. Gauthier, P. Schwab, H. Bourdages, D. Chabot, F. Collier, F. Grégoire, Y. Lambert, G. Moreault, L. Pageau and J. Spingle. 2003. The status of cod in the Northern Gulf of St. Lawrence (3Pn, 4RS) in 2002. CSAS Research document 2003/065.
- ICES2004a. Report of the Arctic fishery working group. ICES CM 2004/ACFM:28
- ICES 2004b. Report of the Baltic Fisheries Assessment Working Group. ICES CM 2004/ACFM:22.
- ICES 2004c. Report on the assessment of demersal stocks in the North Sea and Skagerakk. ICES CM 2004/ACFM:07
- ICES 2004d. Report of the working group on the Assessment of the Southern Shelf Demersal Stocks. ICES CM2004/ACFM:03
- ICES 2005. Report of the working group on the assessment of Northern shelf demarsal stocks (WGN SDS). ICES CM 2005/ACFM:01
- ICES 2004e. Report of the North Western working group . ICES CM 2004/ACFM:25
- ICES 2001. Report of the Baltic Fisheries Assessment Working Group. ICES CM 2001/ACFM:18.
- ICES 2002. Report of the study group on incorporation of process information into stock recruitment models. ICES CM 2002/C:01.
- Lilly, G.R., Shelton, P.A., Bratley, J., Cadigan, N., Murphy, E.F., Stansbury, D.E., Davis, M.B., and Morgan, M.J. 1998. An assessment of the cod stock in NAFO Divisions 2J+3KL. DFO Can. Stock Assess. Sec. Res. Doc. 98/15.
- Lilly, G.R., Murphy, E.F., Healey, B.P., Maddock Parsons, D., and Stead, R. 2004. An update of the status of the cod (*Gadus morhua*) stock in NAFO Divisions 2J+3KL in March 2004. DFO Can. Sci. Adv. Sec. Res. Doc. 2004/023.

North Atlantic cod stocks max stock size



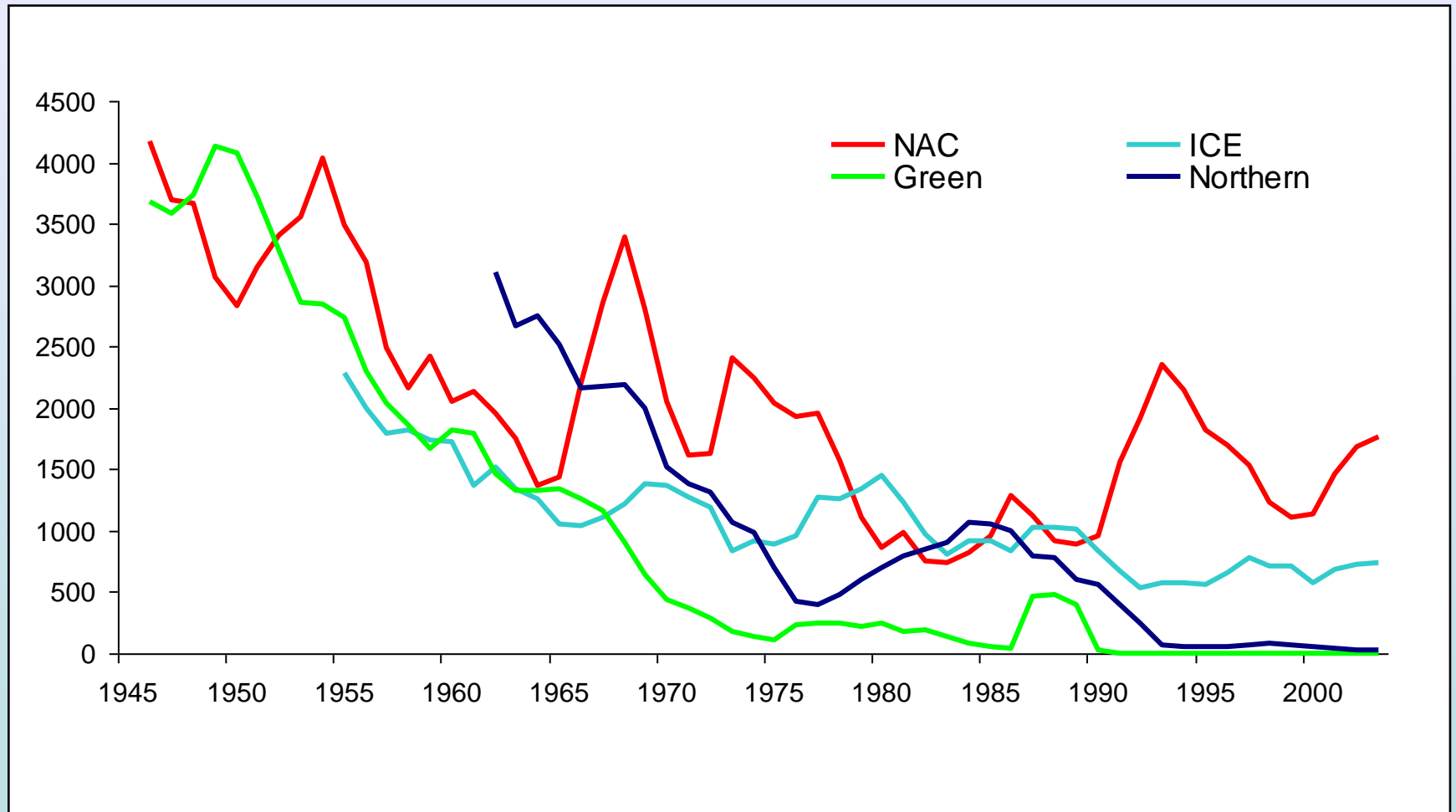
North Atlantic cod stocks

Max spawning stock biomass



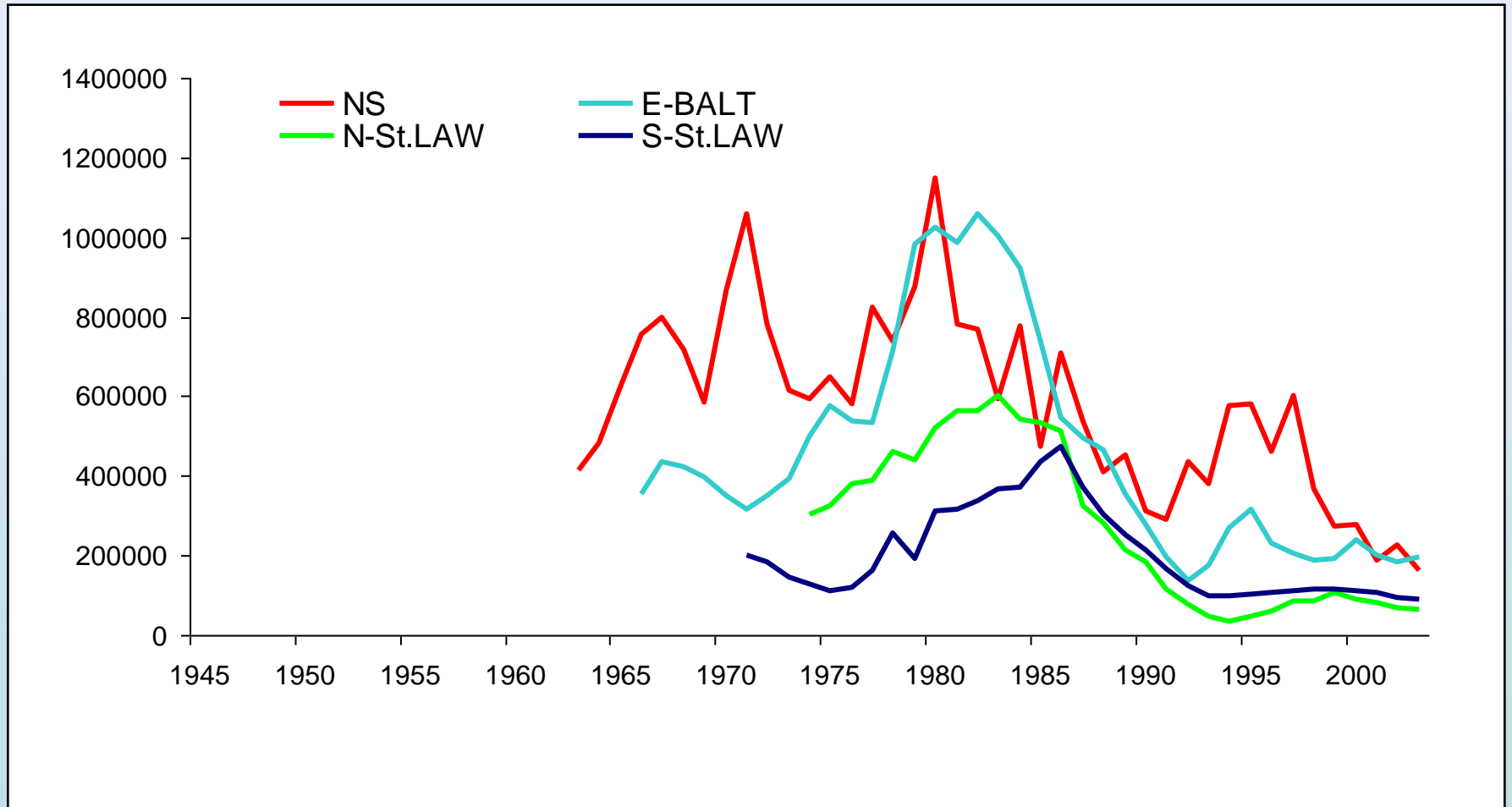
North Atlantic cod stocks

Historical changes in stock size



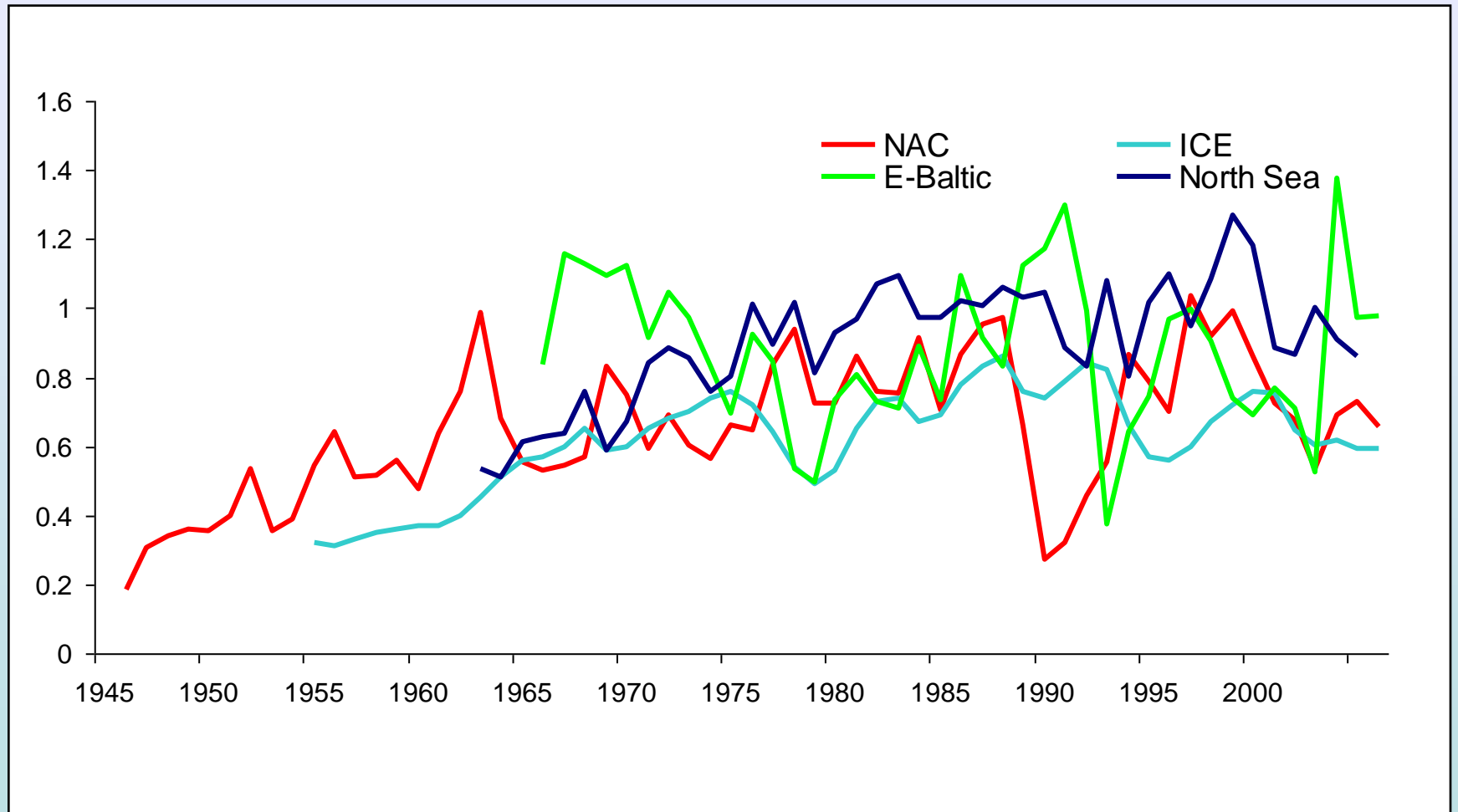
North Atlantic cod stocks

Historical changes in stock size

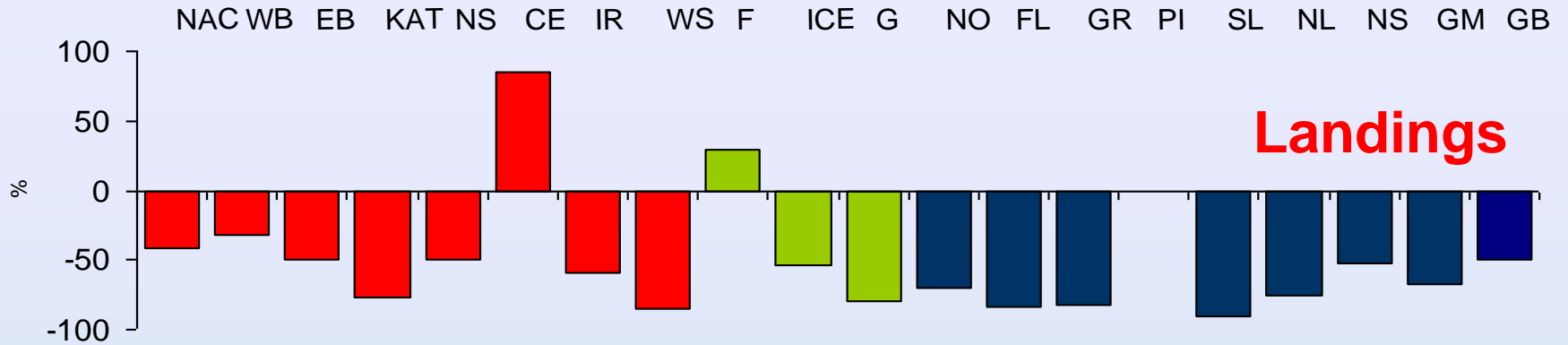


North Atlantic cod stocks

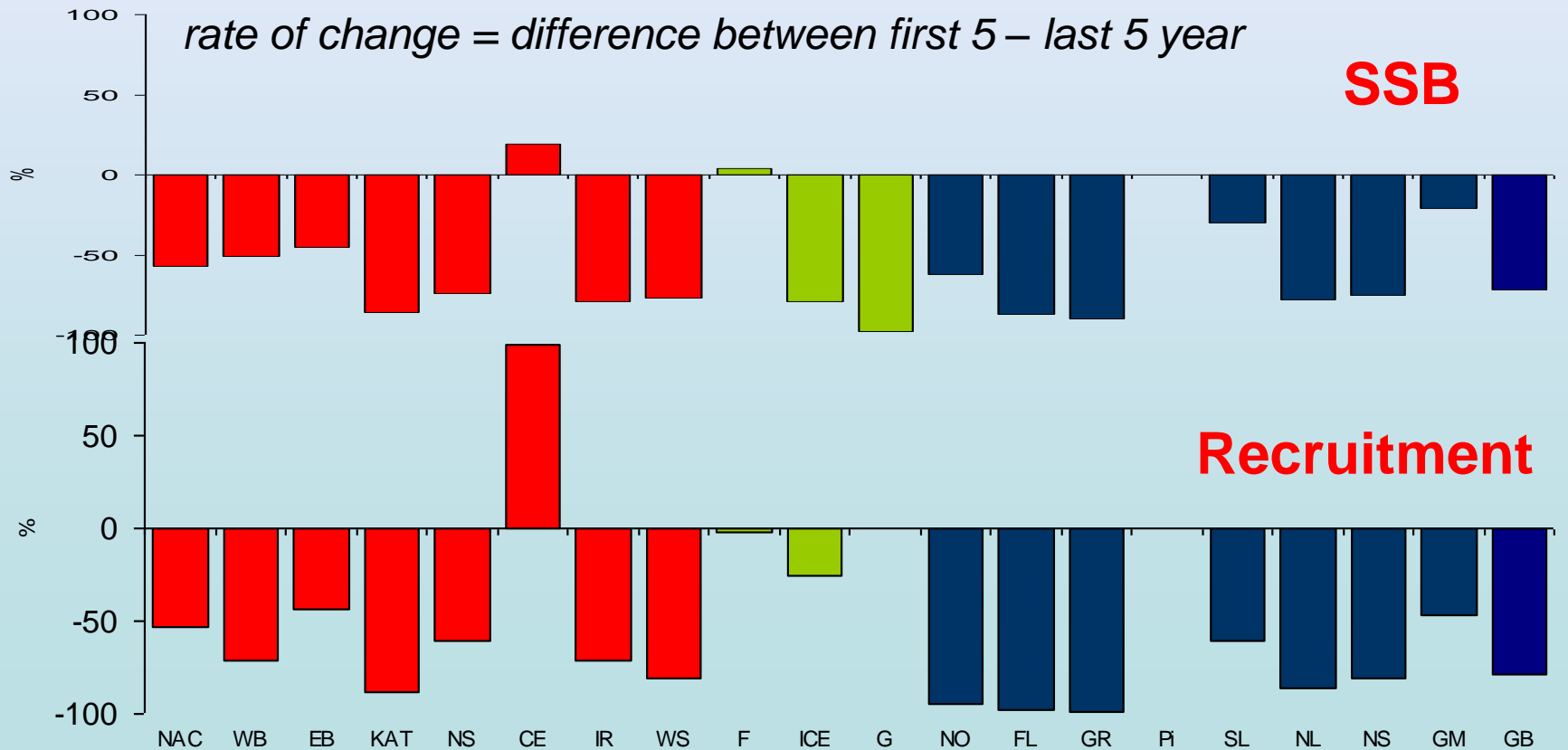
Historical changes in fishing mortality



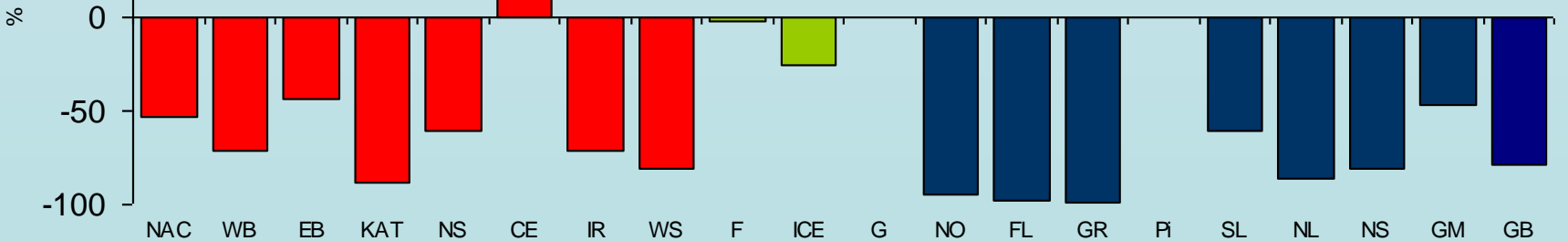
North Atlantic cod – rate of change (%)



rate of change = difference between first 5 – last 5 year



Recruitment

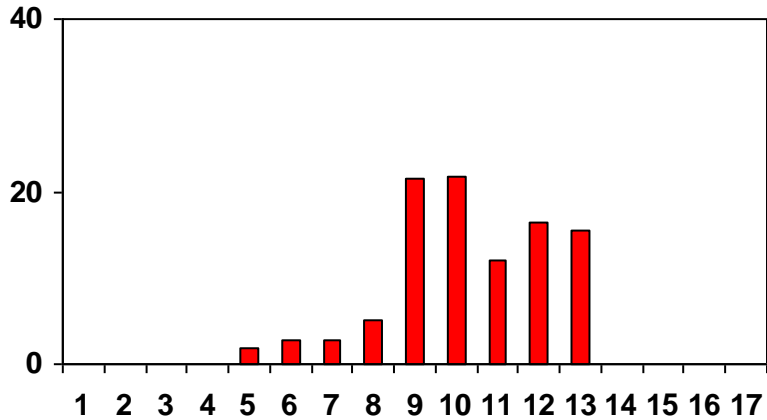


North Atlantic cod stocks

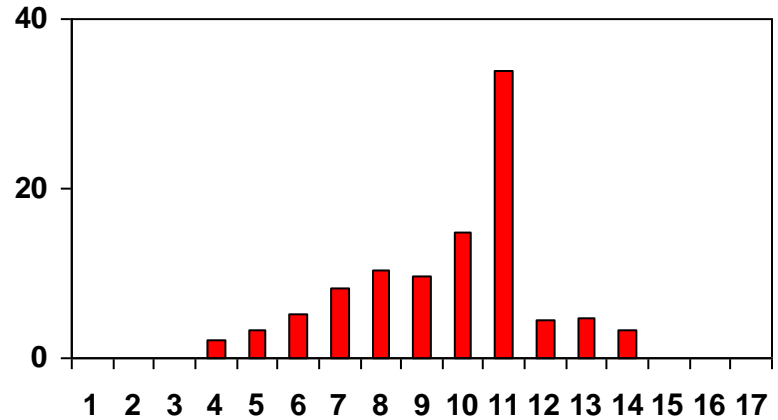
Spawning stock age structures

%

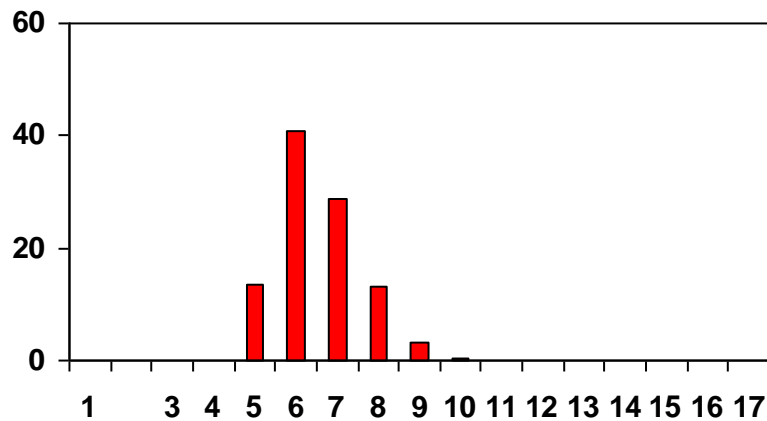
NAC 1946



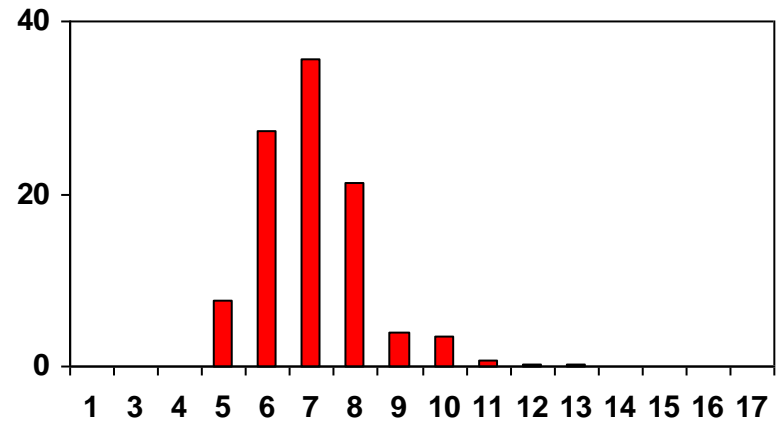
ICE 1955



NAC 2003

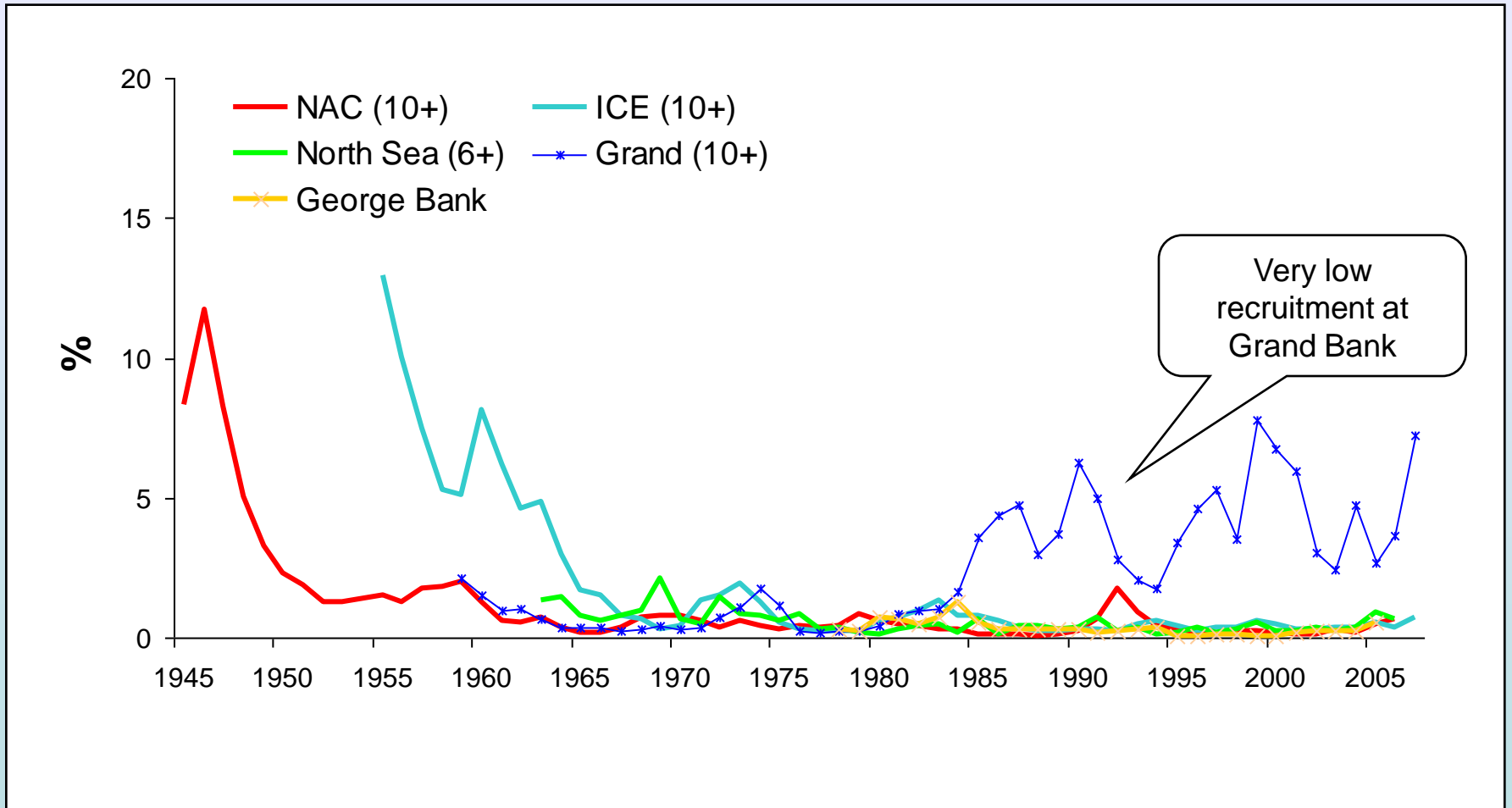


ICE 2004



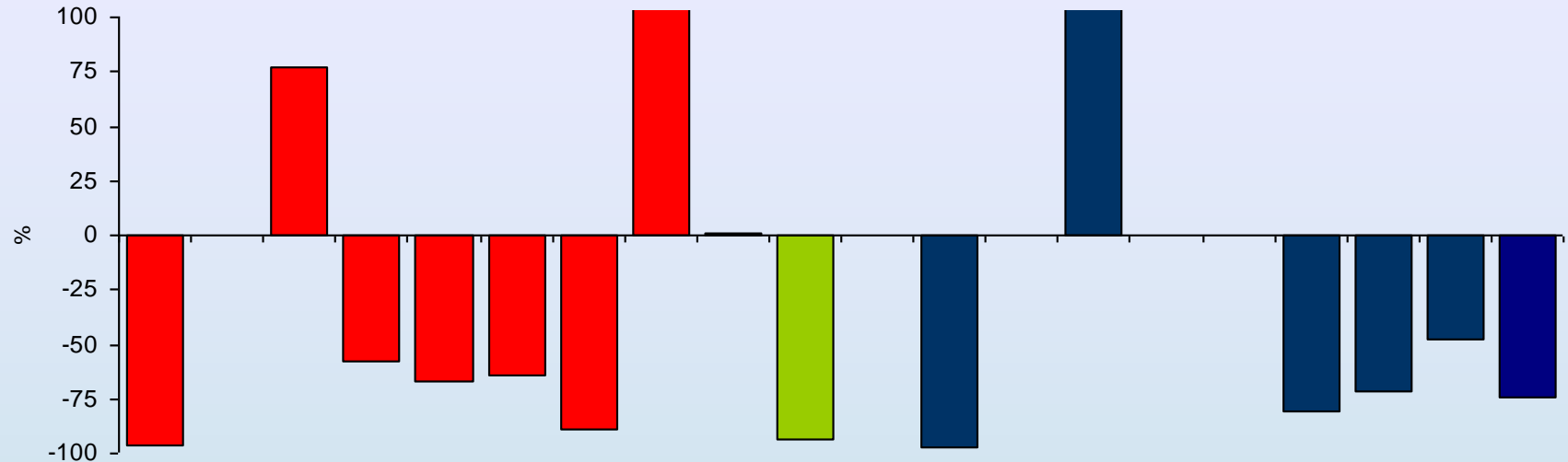
North Atlantic cod stocks

Proportion 10+ or 6+

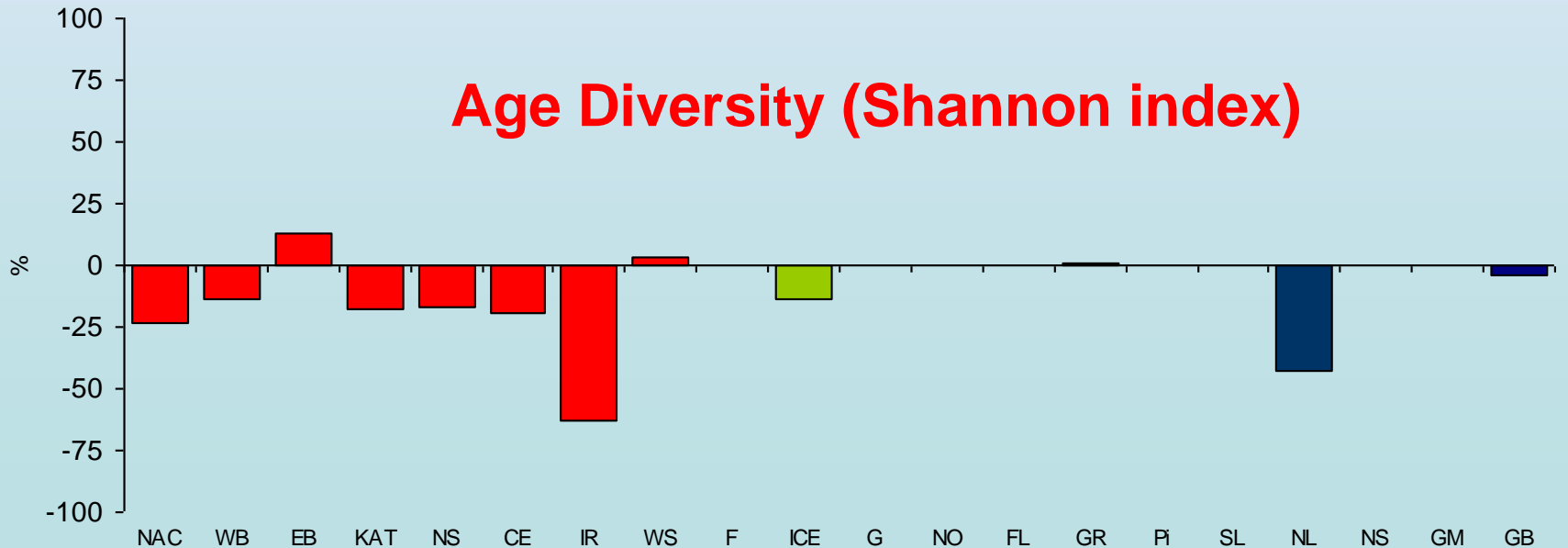


North Atlantic cod – % rate of change

Proportion old cod (6 or 10+)

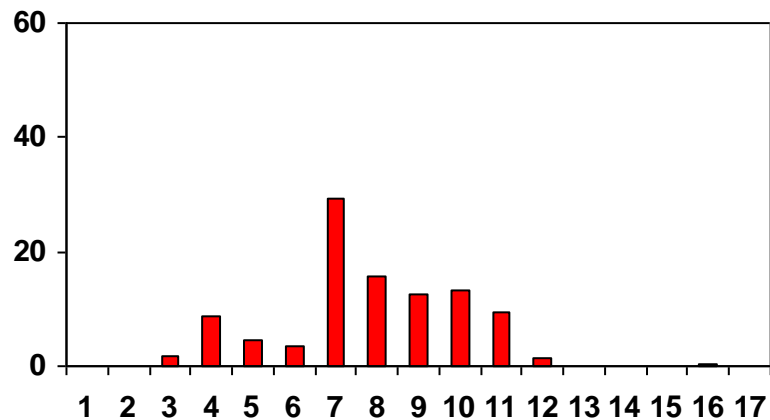


Age Diversity (Shannon index)

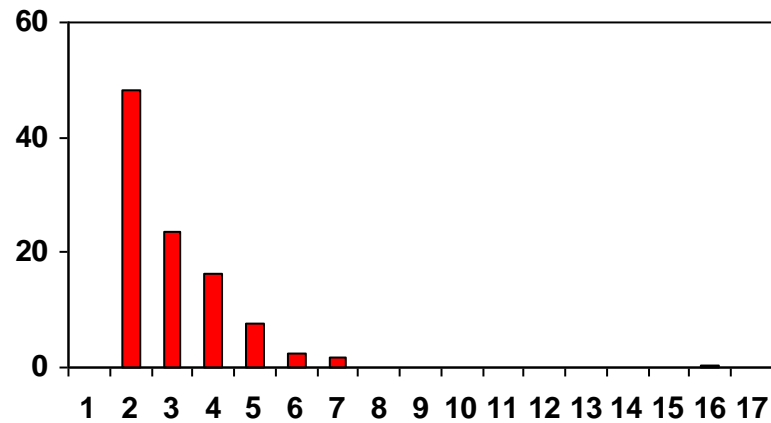


North Atlantic cod – Age structures

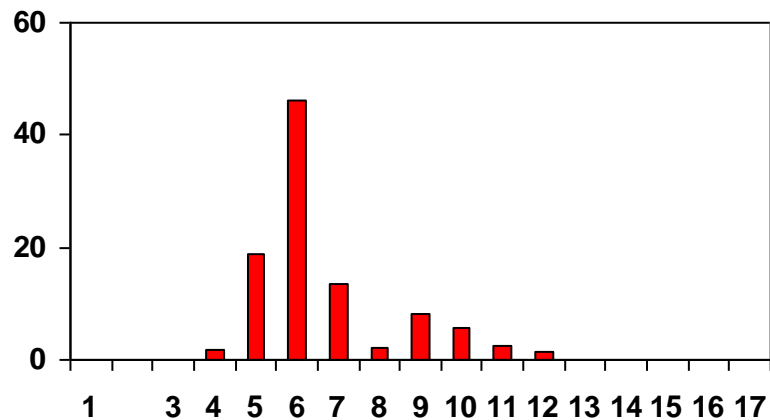
Grand Bank 1959



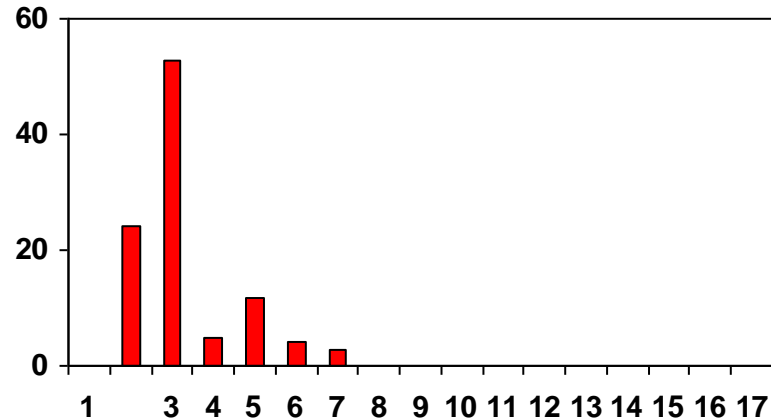
West Scotland 1978



Grand Bank 2003

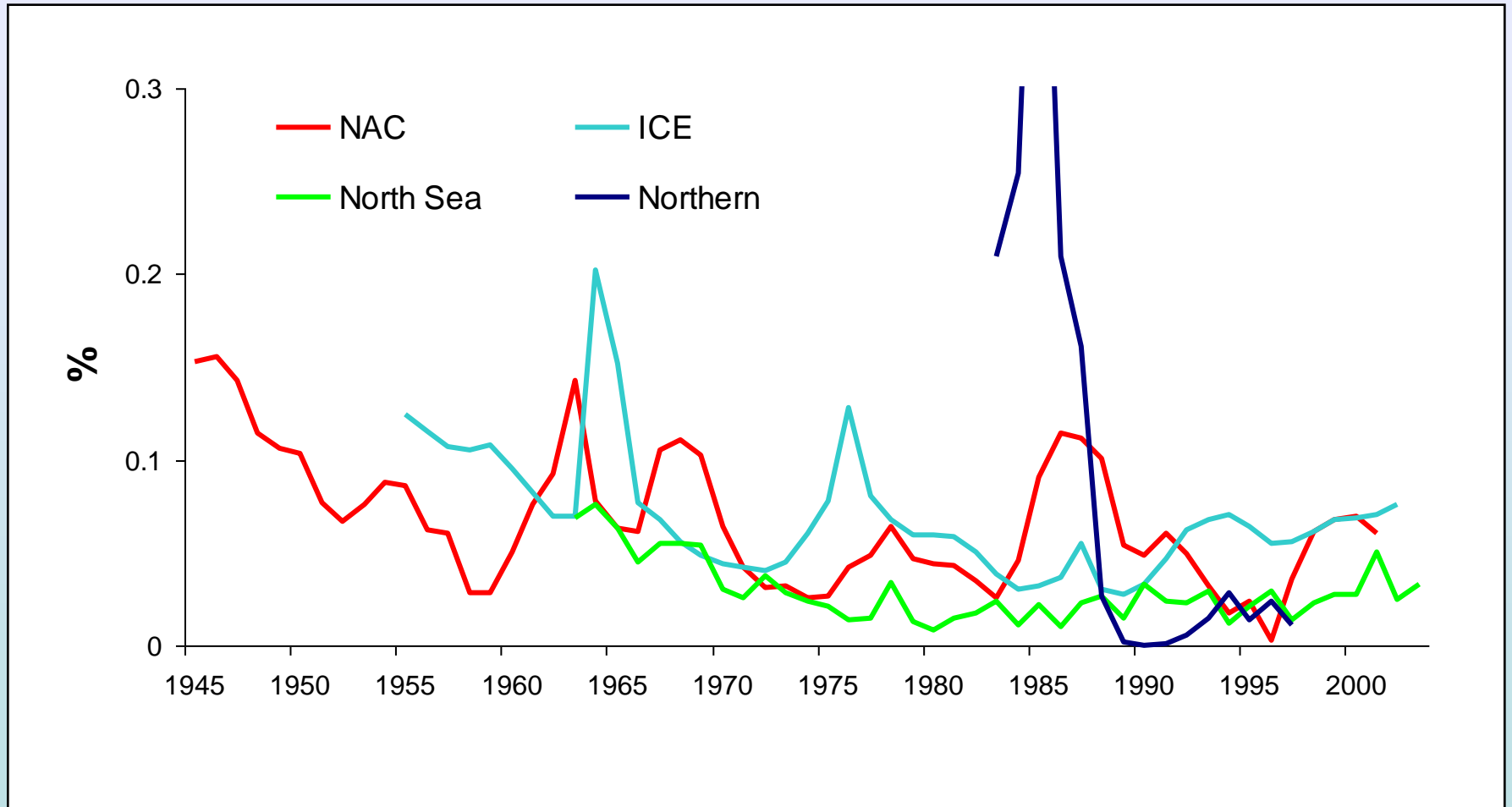


West Scotland 2004



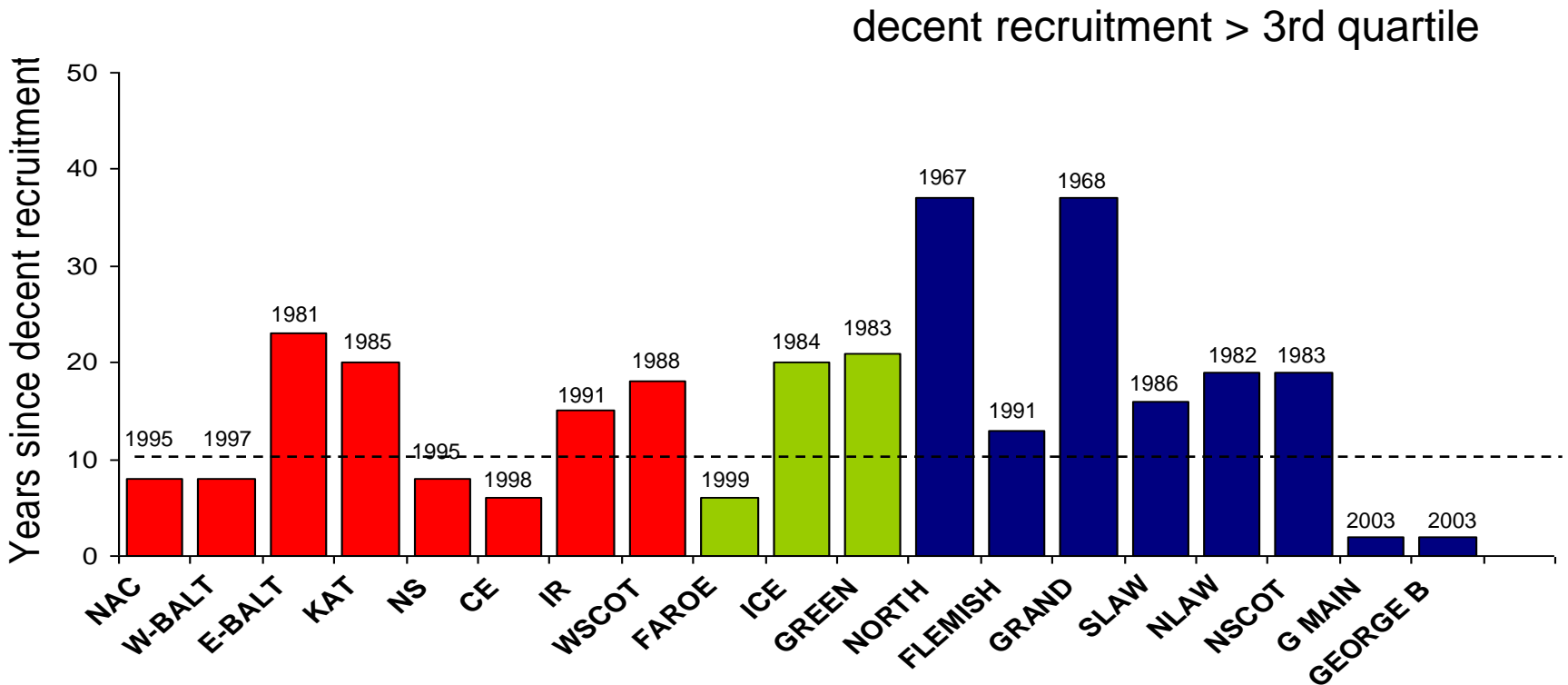
North Atlantic cod stocks

Proportion surviving to age at 50% maturity



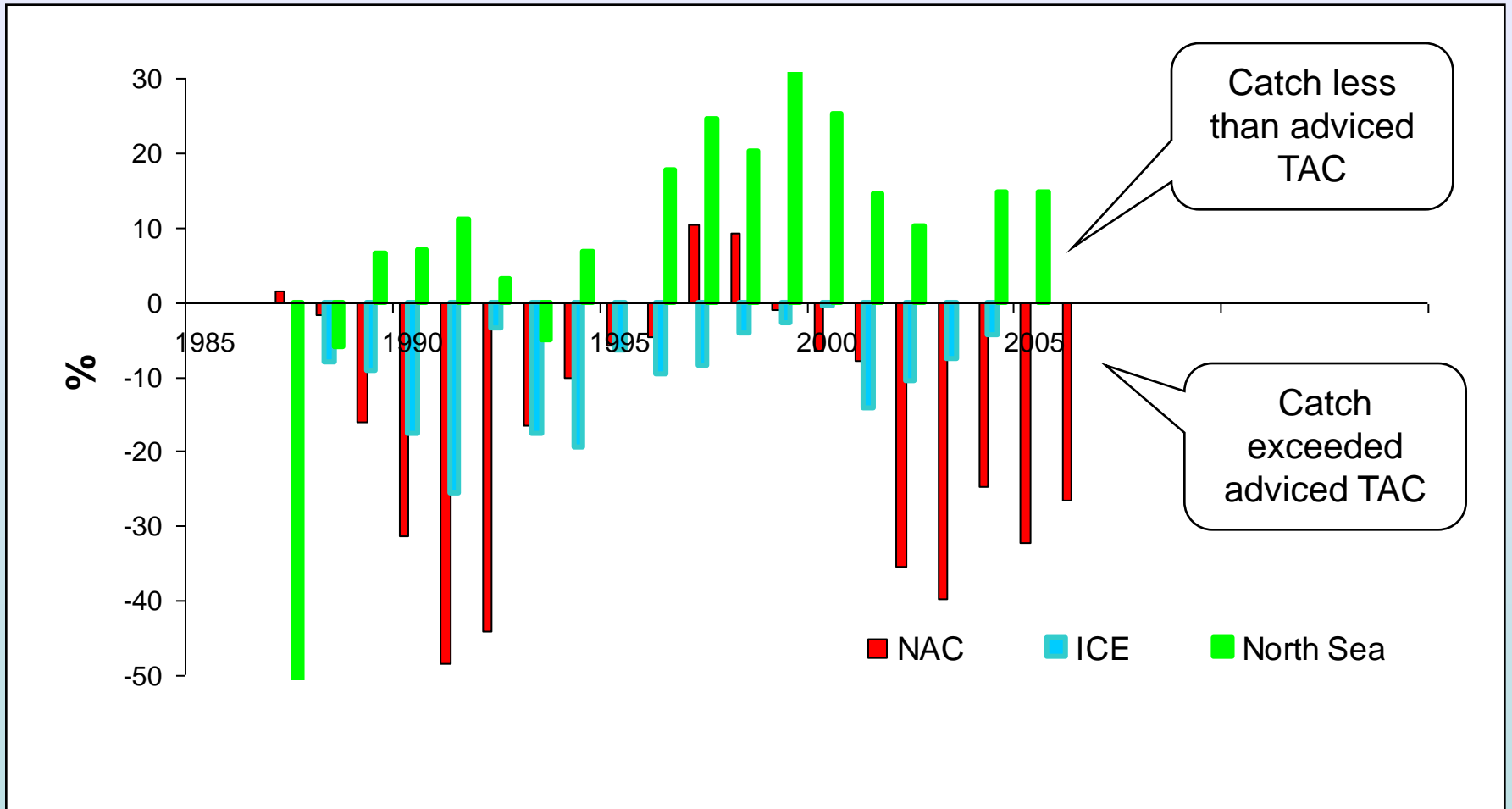
North Atlantic cod stocks

“Recruitment Health index”



North Atlantic cod stocks

Expected catch – Recorded catch



Status of the North Atlantic cod stocks

