

INTERNATIONAL ATOMIC ENERGY AGENCY UNITED NATIONS EDUCATIONAL, SCIENTIFIC AND CULTURAL ORGANIZATION INTERNATIONAL CENTRE FOR THEORETICAL PHYSICS I.C.T.P., P.O. BOX 586, 34100 TRIESTE, ITALY, CABLE: CENTRATOM TRIESTE



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# THIRD AUTUMN COURSE ON MATHEMATICAL ECOLOGY

(29 October - 16 November 1990)

### Readings

- 1. Adaptive management of natural resources
- 2. Models for fisheries
- 3. Fitting models to data

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These are preliminary lecture notes, intended only for distribution to participants.

# Readings: Adaptive management of natural resources

- Hilborn, R. and J. Sibert. 1988. Adaptive management of developing fisheries. Marine Policy. April 1988 pp. 112-121.
- Hilborn, R. 1987. Living with uncertainty in resource management. North American Journal of Fisheries Management. 7: 1-5.
- Hilborn, R. and C.J. Walters. 1991. Fisheries stock assessment and management. Chapman and Hall, New York. chapter 17.
- Raiffa, H. 1968. Decision analysis: Introductory lectures on choices under uncertainty. Addison-Wesley.
- Sainsbury, K. 1988. The ecological basis of multispecies fisheries, and management of a demersal fishery in tropical Australia. pp 349-382 in J. Gulland (ed.) Fish Population Dynamics, Second Edition. John Wiley and Sons, Chichester.
- Walters, C.J. 1986. Adaptive management of renewable resources. Macmillian Publishing Co. New York. 374 p.
- Walters, C.J. and R. Hilborn. 1976. Adaptive control of fishing systems. J. Fish. Res. Board Can. 33; 145-159.
- Walters, C.J. and R. Hilborn. 1978. Ecological optimization and adaptive management. Ann. Rev. Ecol. Syst. 9: 157-188

#### Readings: Models for fisheries

- Beverton, R.J.H. and S.J. Holt. 1957. On the dynamics of exploited fish populations. U.K. Min. Agric. Fish., Fish. Invest. Ser. 2 19:533pp.
- Caddy, J.F. and J.A. Gulland. 1983. Historical patterns of fish stocks. Marine Policy 7: 267-278.
- Clark, C.W. 1985. Bioeconomic modelling and fisheries management. John Wiley & Sons. New York. 291 p.
- Gordon, H.S. 1953. An economic approach to the optimum utilization of fishery resources. J. Fish. Res. Bd. Canada 19: 442-457.
- Graham, M. 1935. Modern theory of exploiting a fishery and application to North Sea trawling, J. Cons. Int. Explor. Mer 10: 264-274.
- Gulland J.(ed.) 1988. Fish Population Dynamics, Second Edition. John Wiley and Sons, Chichester.
- Hilborn, R. and C.J. Walters. 1991. Fisheries stock assessment and management. Chapman and Hall, New York. chapters 3 and 4.
- May, R.M. (ed). 1984. Exploitation of marine communities. Report of the Dahlem workshop on exploitation of marine communities. Berlin. 1984. April 1-6. Life Sciences Research Report 32. Springer Verlag, Berlin.
- Ricker, W.E. 1954. Stock and recruitment. J. Fish. Res. Board Can. 11:559-623.
- Schaefer, M.B. 1954. Some aspects of the dynamics of populations important to the management of commercial marine fisheries. Bull. Inter.-Amer. trop. Tuna Comm. 1: 27-56.
- Smith, V.L. 1969. On models of commercial fishing. J. Polit. Econ. 77: 181-198.
- Walters, C.J. 1969. A generalized computer simulation model for fish population studies. Trans. Am. Fish. Soc. 98: 505-512.

## Readings: Fitting models to data

- Edwards, A.W.F. 1972. Likelihood. Cambridge U. Press. 235 p.
- Hilborn, R. and C.J. Walters. 1991. Fisheries stock assessment and management. Chapman and Hall, New York. chapter 6
- Lakatos, I. 1970. Falsification and the methodology of scientific research programmes. in Lakatos I. and A. Musgrave [eds] Criticism and the growth of knowledge. Cambridge U. Press
- Linhart, H. and W. Zucchini. 1986. Model Selection. John Wiley & Sons. New York. 301 p.
- Popper, K. 1959. The logic of scientific discovery.
- Press, W.H., B.P. Flannery, S.A. Teukolsky, William T. Vetterling. 1986. Numerical recipes: the art of scientific computing. Cambridge University Press. 818p.
- Seber, G.A.F. and C.J. Wild. 1989. Nonlinear regression. John Wiley and Sons. New York.

