Math 145
Chaos Theory

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Meeting #1Th, April 6

- Useless Arithmetic
- Chaos and the Commons
- Nova Chaos Video

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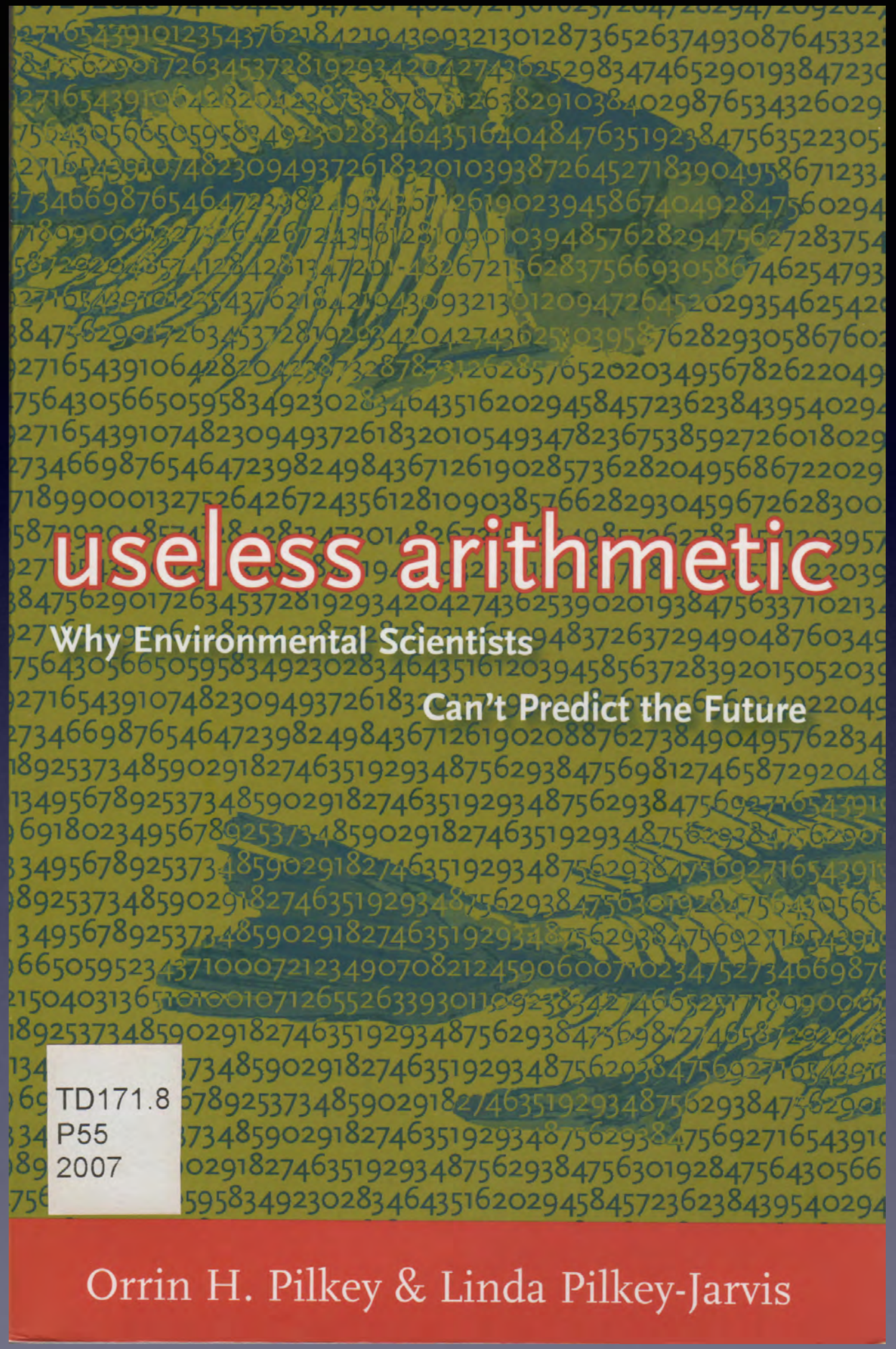


Useless Arithmetic

- We cannot predict the future:
  - Cod fish decline
  - Shoreline erosion
  - Diffusion of toxic wastes

Useless Arithmetic

- WHY we cannot predict the future:
  - Faulty models
  - Errors in initial conditions (sensitivity)
  - Excluded forces (bifurcations)

North Atlantic Codfish Collapse

- From Pilkey Ch. 1:
  - 1969, catch began downward slide
  - 1974, catch was 34,000 tons
  - 1989, catch was 125,000 tons, 60 % of total cod stock
  - 1992, Canadian gov closed fishery

WHY

- Model is chaotic
- Model prediction was wrong
- Canadian gov split between model prediction and fishermen demands

The Model

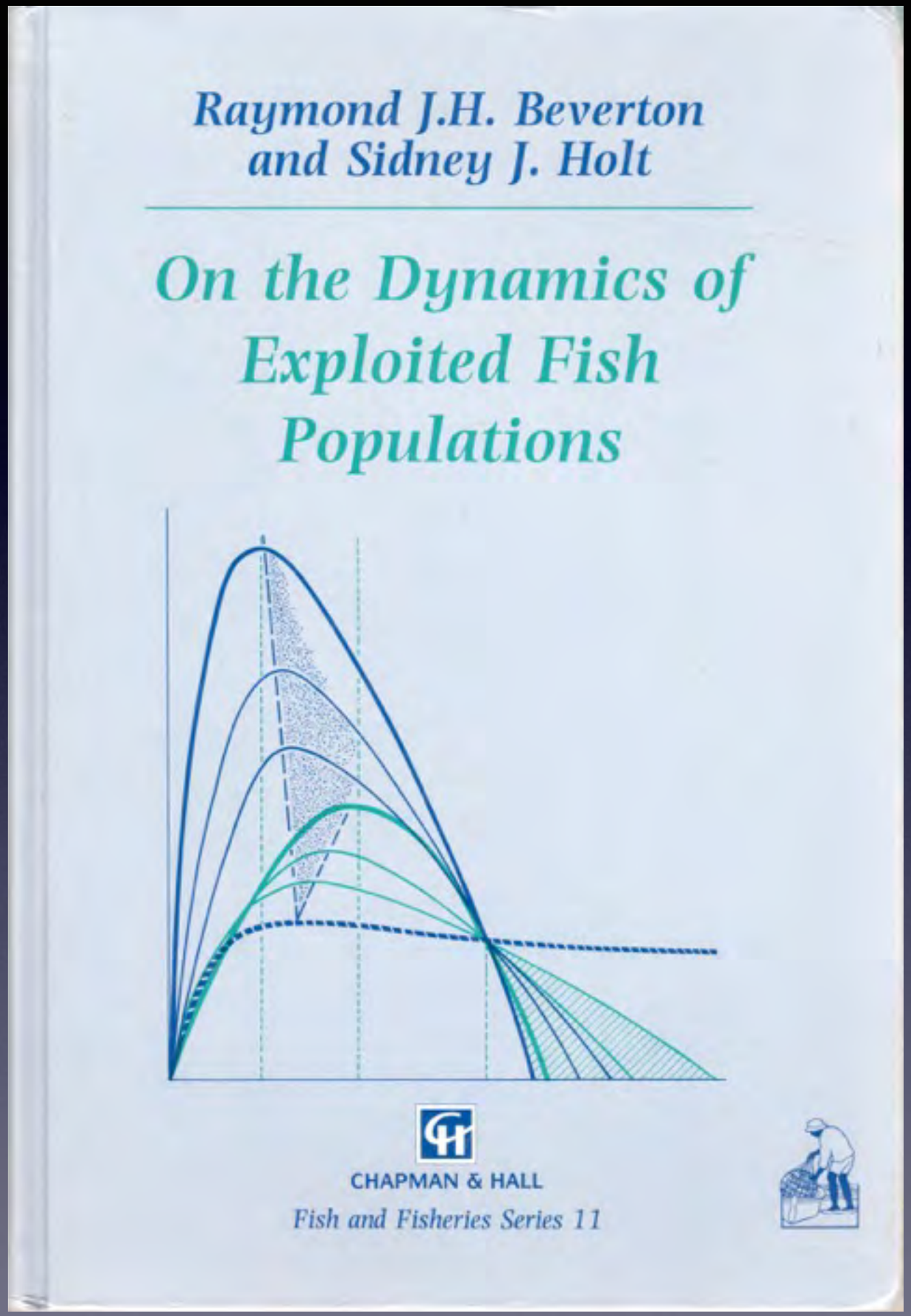
The Becking Equation, 1946

$$R(E) = \alpha E e^{-\beta E}$$

Unimodular, like logistic

Beverton and Holt discovered chaotic behavior in this 1D iteration

1947-1953



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On to Nova Chaos