

Red Crab (*Chaceon quinqueedens*)



Deep and cold

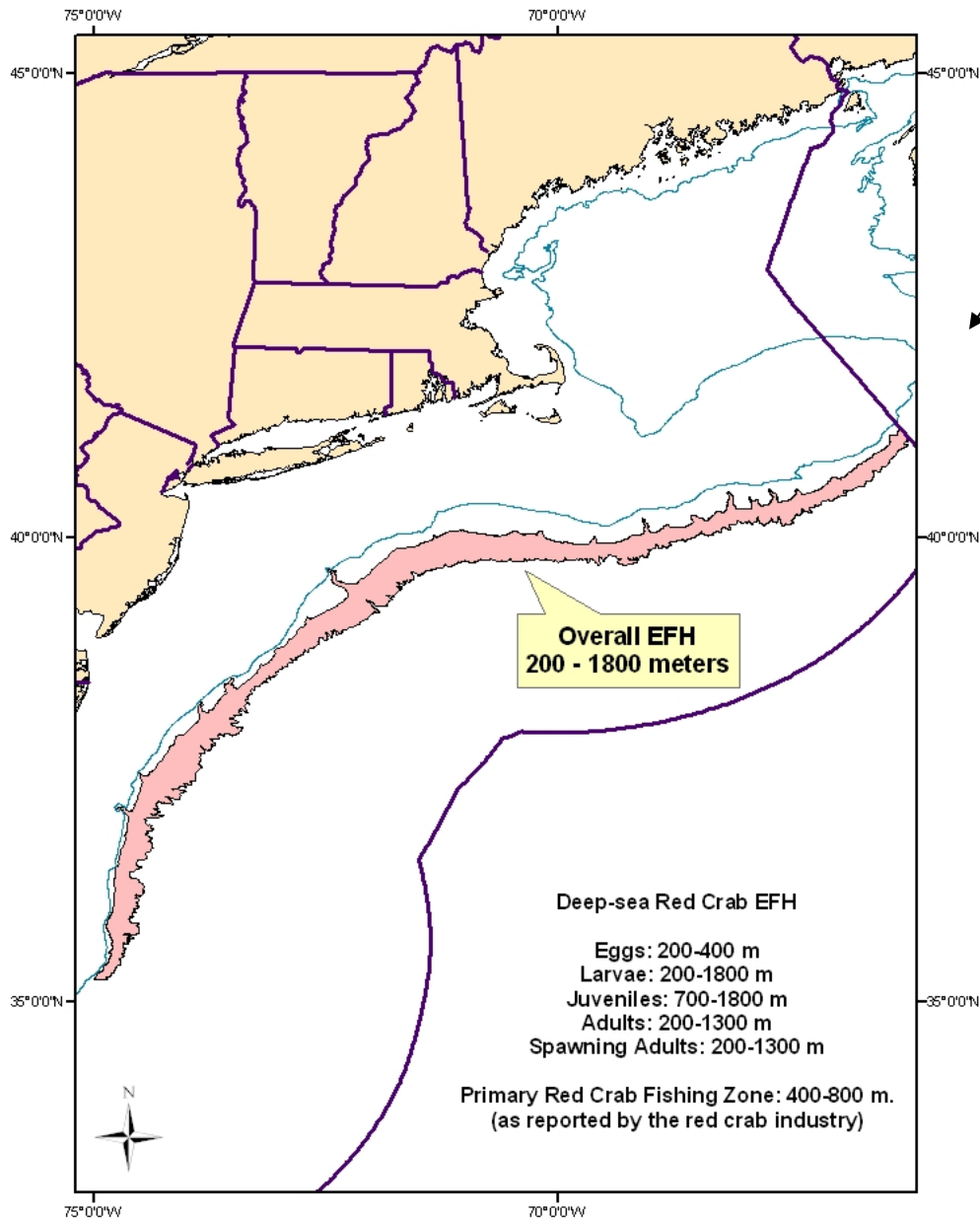
Adults loosely segregated by sex, seasonally migratory

Tagging studies indicate very slow growth

Max size for males ~180mm, females ~136mm

Size at maturity ~75mm for males and ~70mm for females

Can move 30-40 miles



Area of the current fishery

FMP implemented 2002

Many crabs landed live

Year-round

Male-only

Few boats, limited access

Trip limit of 75,000 lbs

Target TAC of 2688 mt

The first MSY as the result of the first assessment (1977):

$(0.5)(0.2)(55 \text{ million pounds}) = 5.5 \text{ million pounds (2494mt)}$

Based on commercial-sized (4.5 inches CW) male crabs, M of 0.2

FMP MSY (2002) is 6.24 million pounds (2830mt)

**Based on biomass of male crabs with a CW of 4.0 inches,
and using an M of 0.15**

Overfishing definition:

Catch/MSY >1

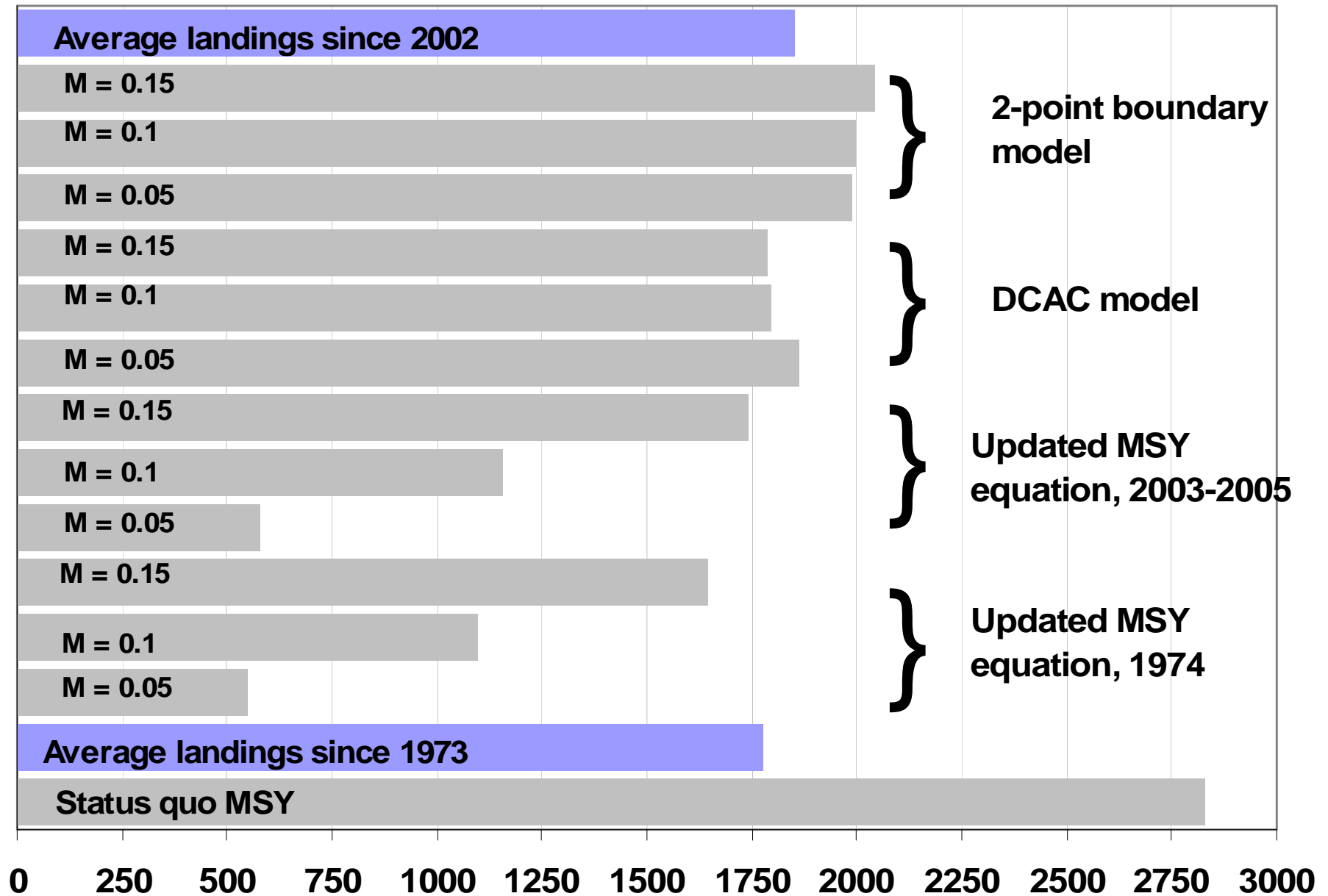
Overfished definition

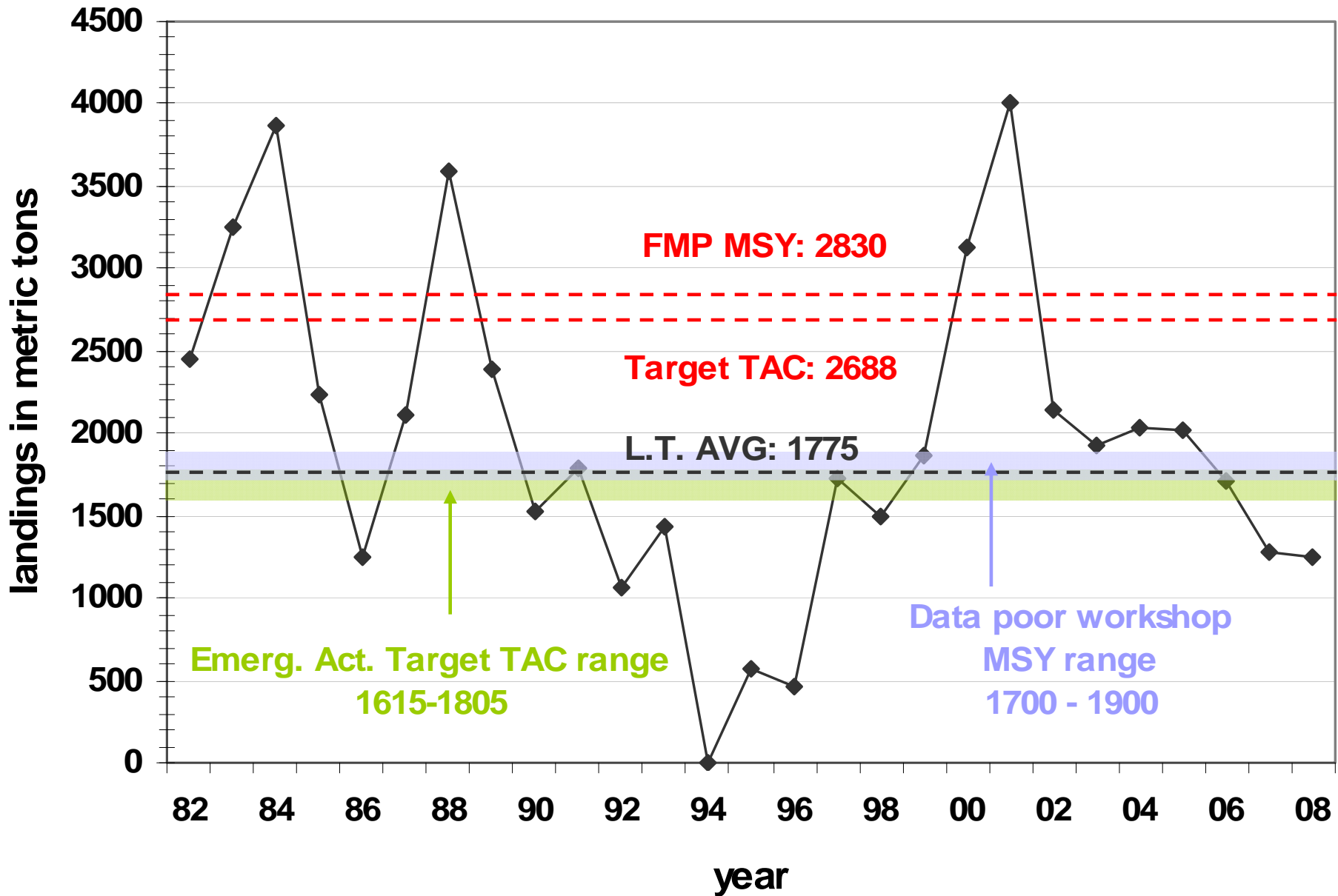
1) Below $\frac{1}{2}$ Bmsy

2) CPUE declines below $\frac{1}{2}$ CPUE₀ for 3 years

3) CPUE falls below $\frac{1}{4}$ CPUE₀ in one year

estimates of sustainable yield for red crab (mt)





Main uncertainties:

**** Biological unknowns: growth, M, longevity**

**** Fishery unknowns: discarding**

**** Surveys**

**** Changes in the population size frequency**

**** Changes in the fishery**

2 Targeted surveys for red crab in 30 years:

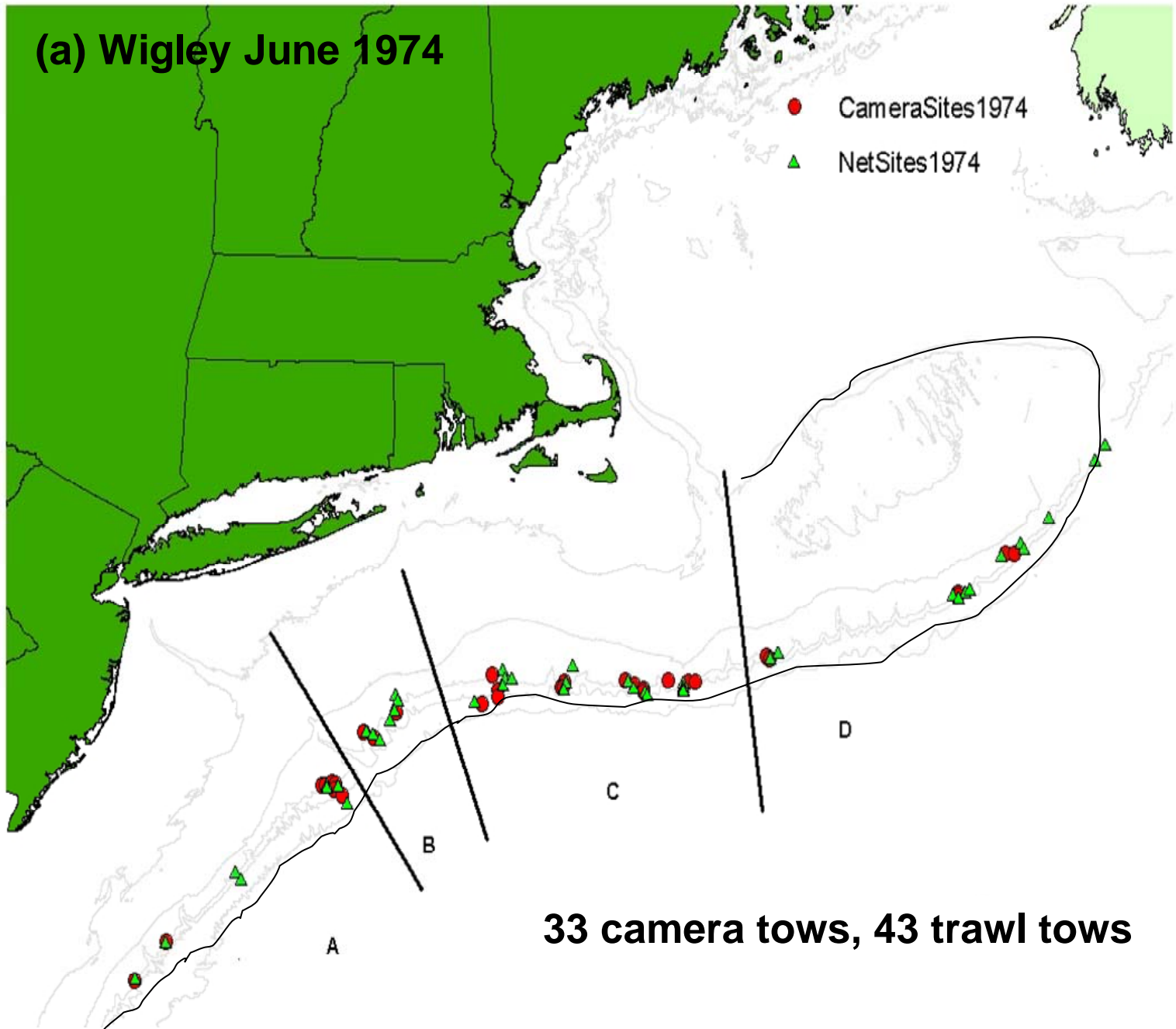
The first in 1974 on the Albatross
(Wigley et al.)

The second over three summers, 2003 to 2005,
on a commercial red crab vessel
(Wahle et al.)

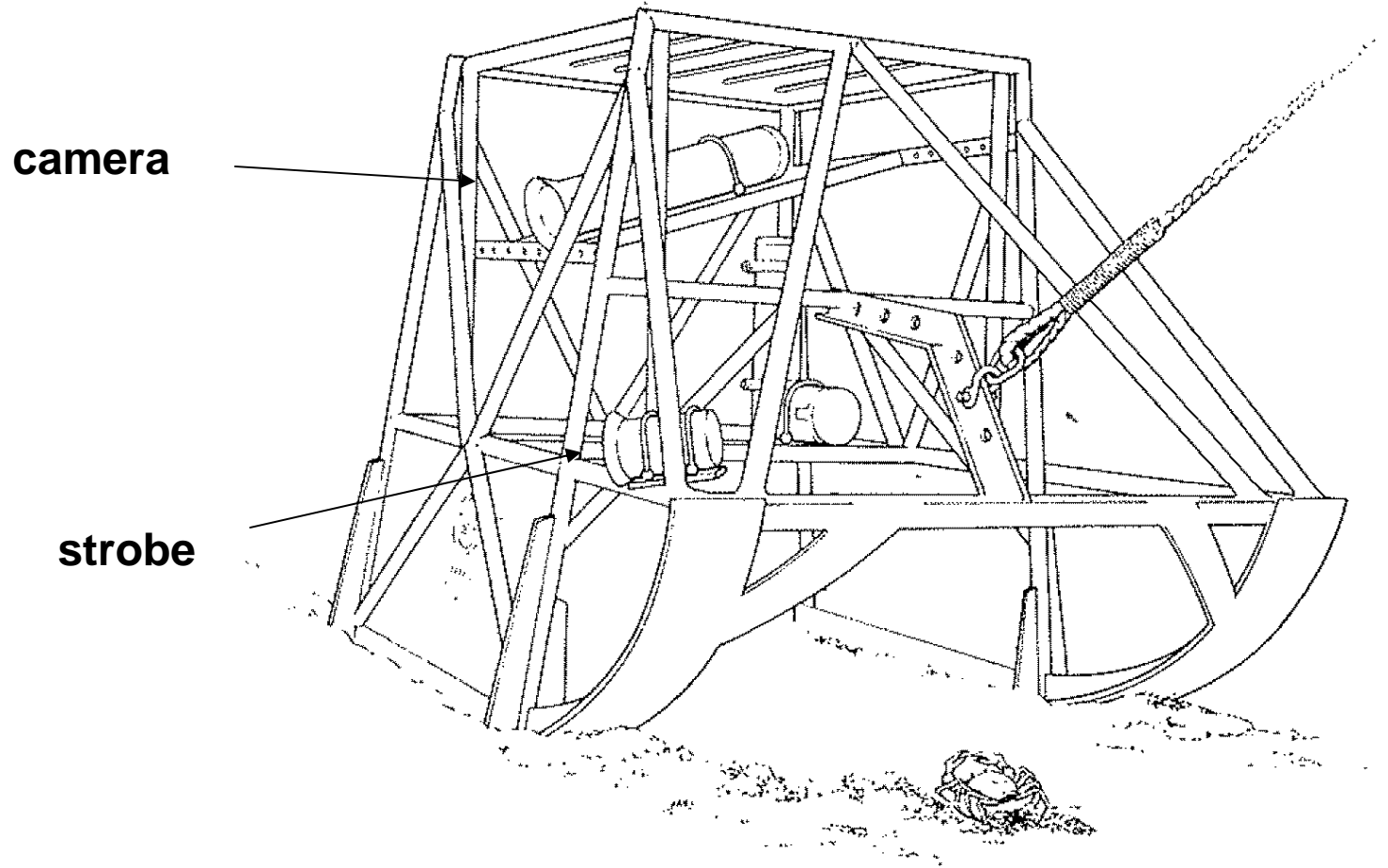


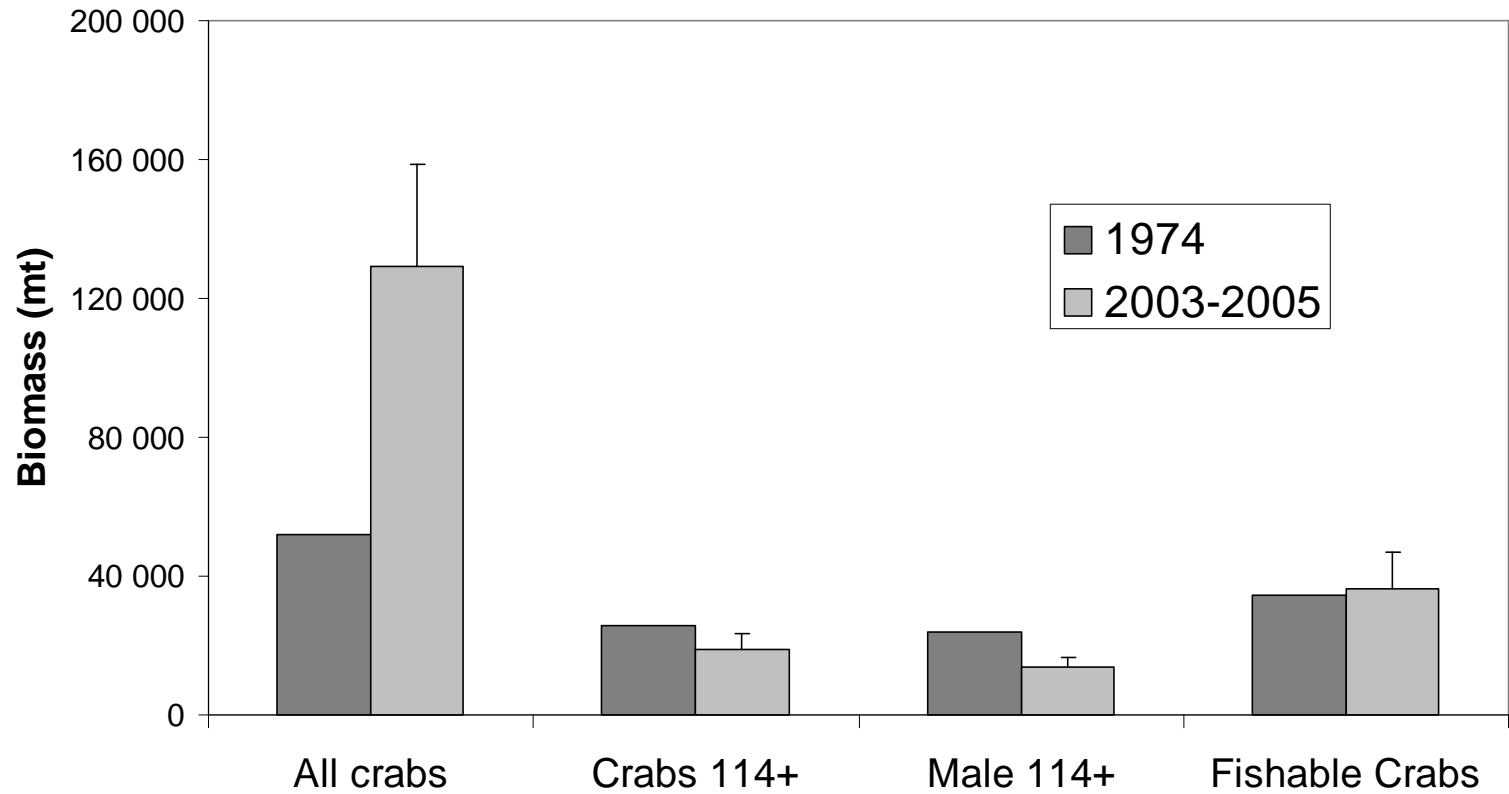
- Used a camera to estimate abundance
- Used a trawl for size and sex composition

(a) Wigley June 1974



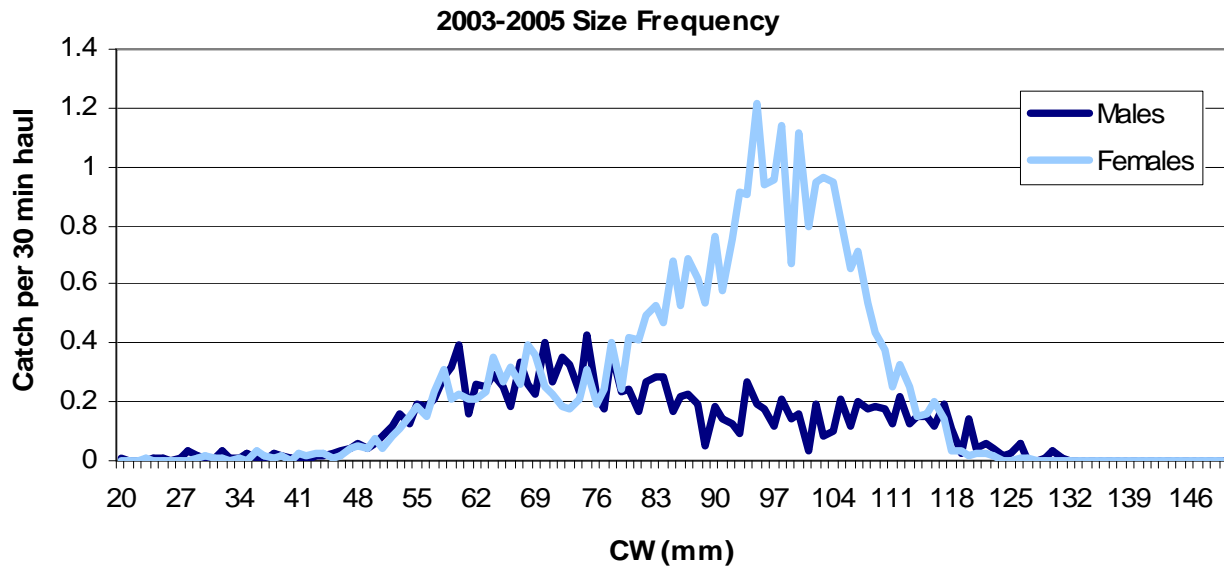
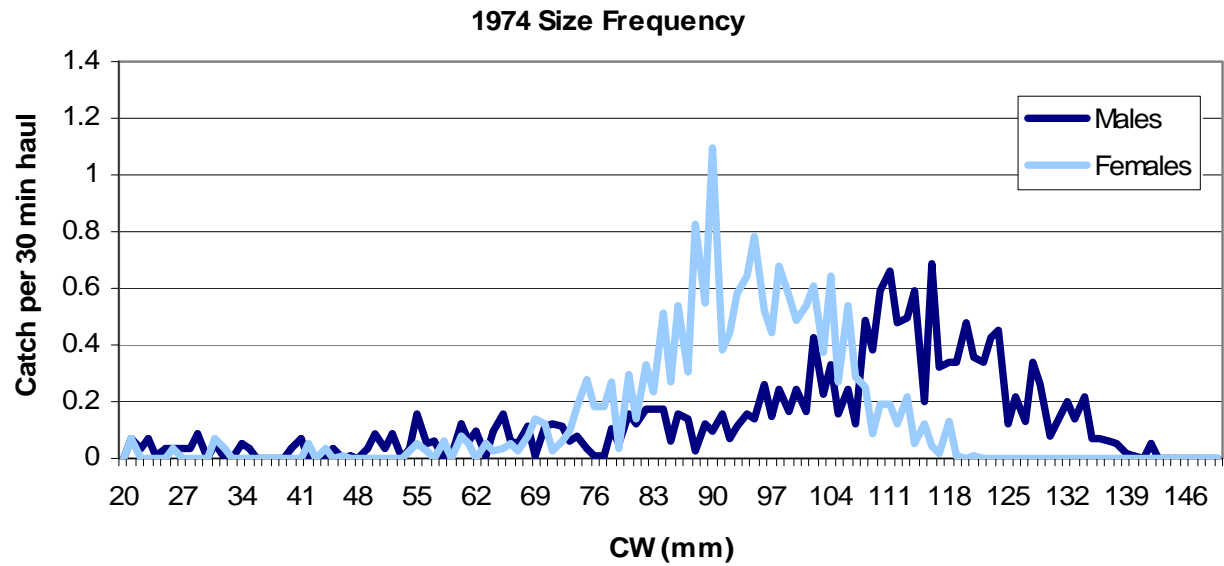
Red crab specific surveys – 1974 and 2003-2005





Survey results





Change in red crab size frequency: mating and marketing

Why worry about losing larger male crabs?

Male makes cage around female, she molts, they mate, he protects her while her shell is soft

She has to fit inside his legs

Takes a couple of weeks

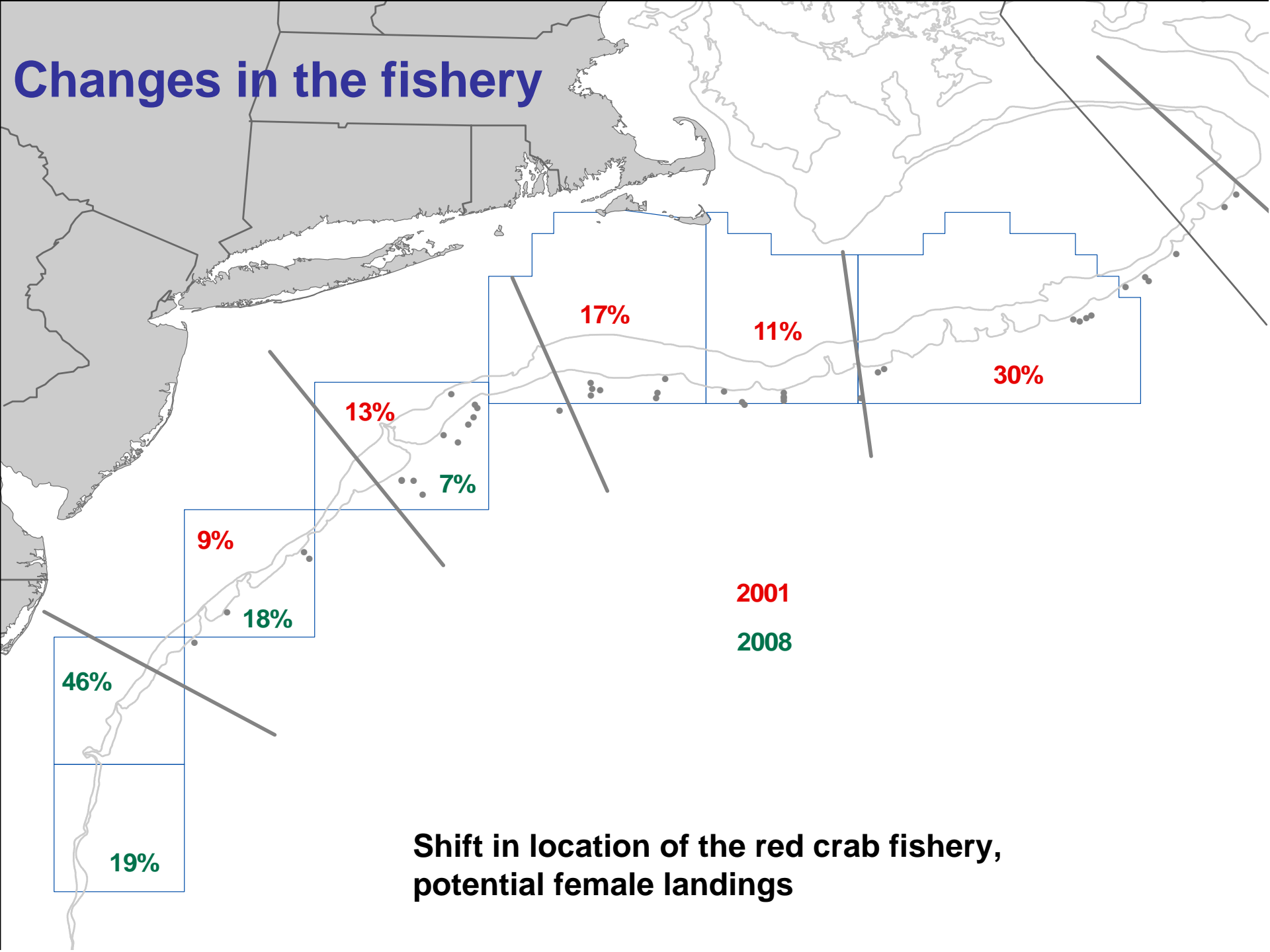
Sperm storage possible

Potential terminal molt

Other crab fisheries have suffered from sperm limitation

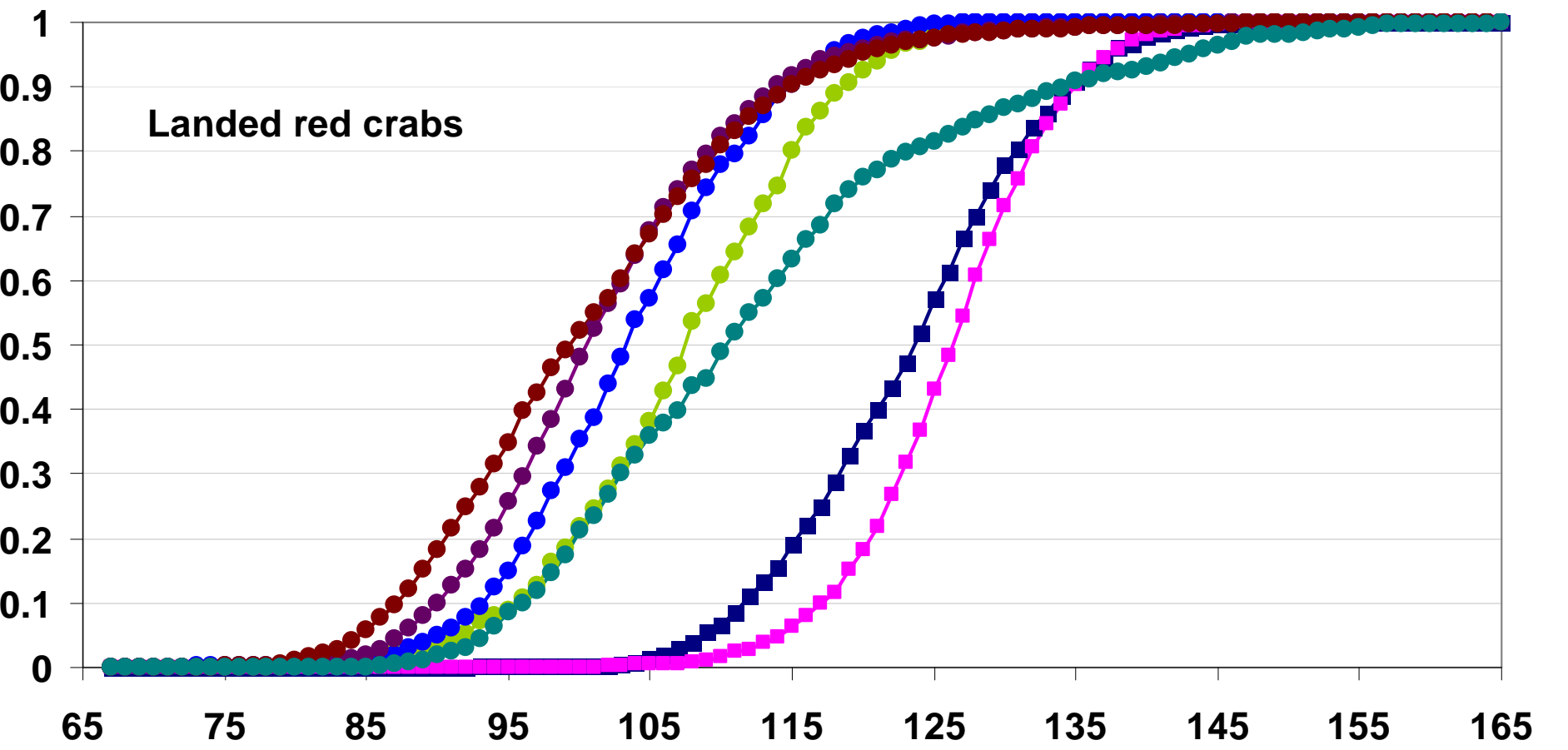


Changes in the fishery



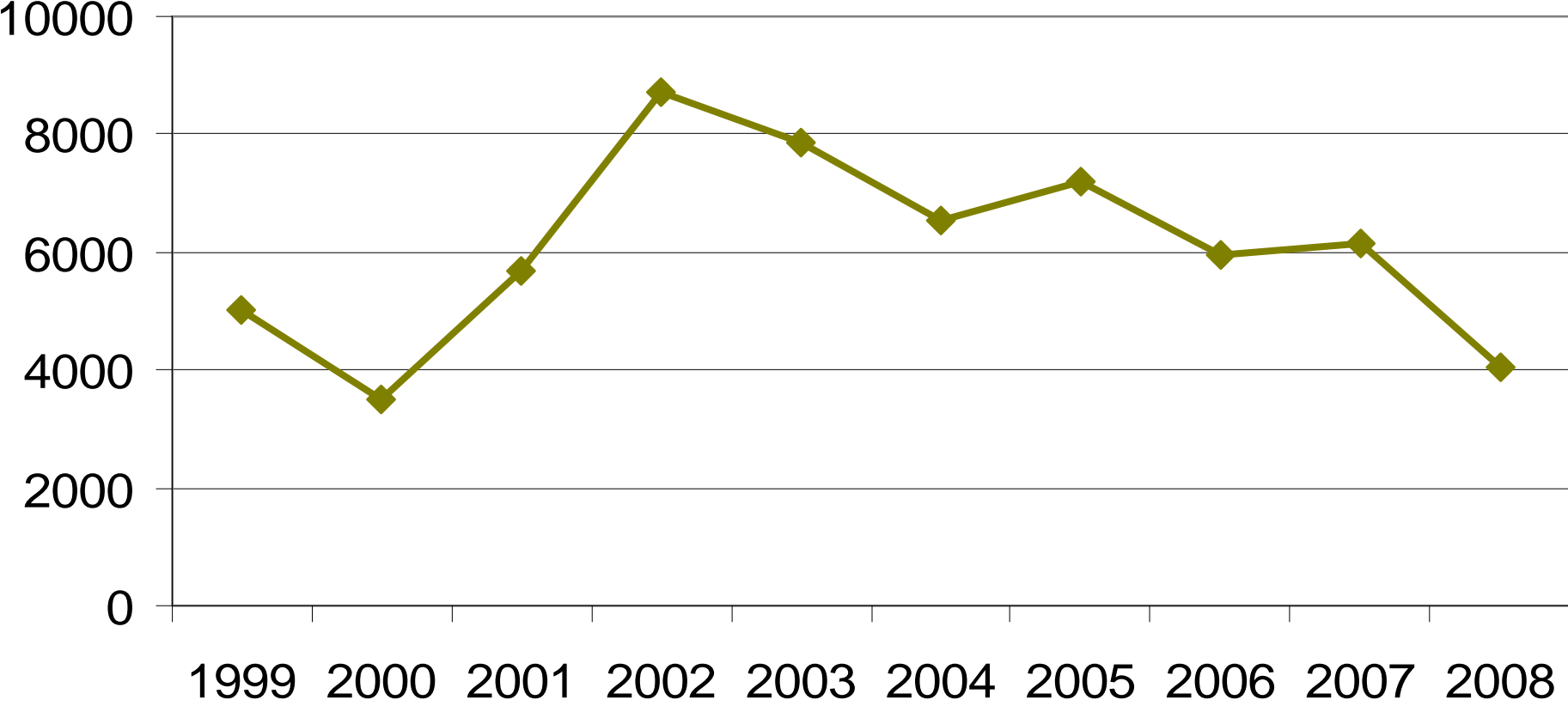
Shift in location of the red crab fishery, potential female landings

■ 1979 Hudson ■ 1979 Atlantis-Veatch ● 2004 ● 2005 ● 2006 ● 2007 ● 2008



Changes in size of landed crabs over time

landings per day away, from VTR (lbs)



Obstacles:

**No regular assessments (2 very different ones so far),
and irregular supplementary surveys (monkfish)**

Growth, mortality data missing/minimal

Concerns:

Changes in length frequencies and mating success

Fishery changes

1974 survey