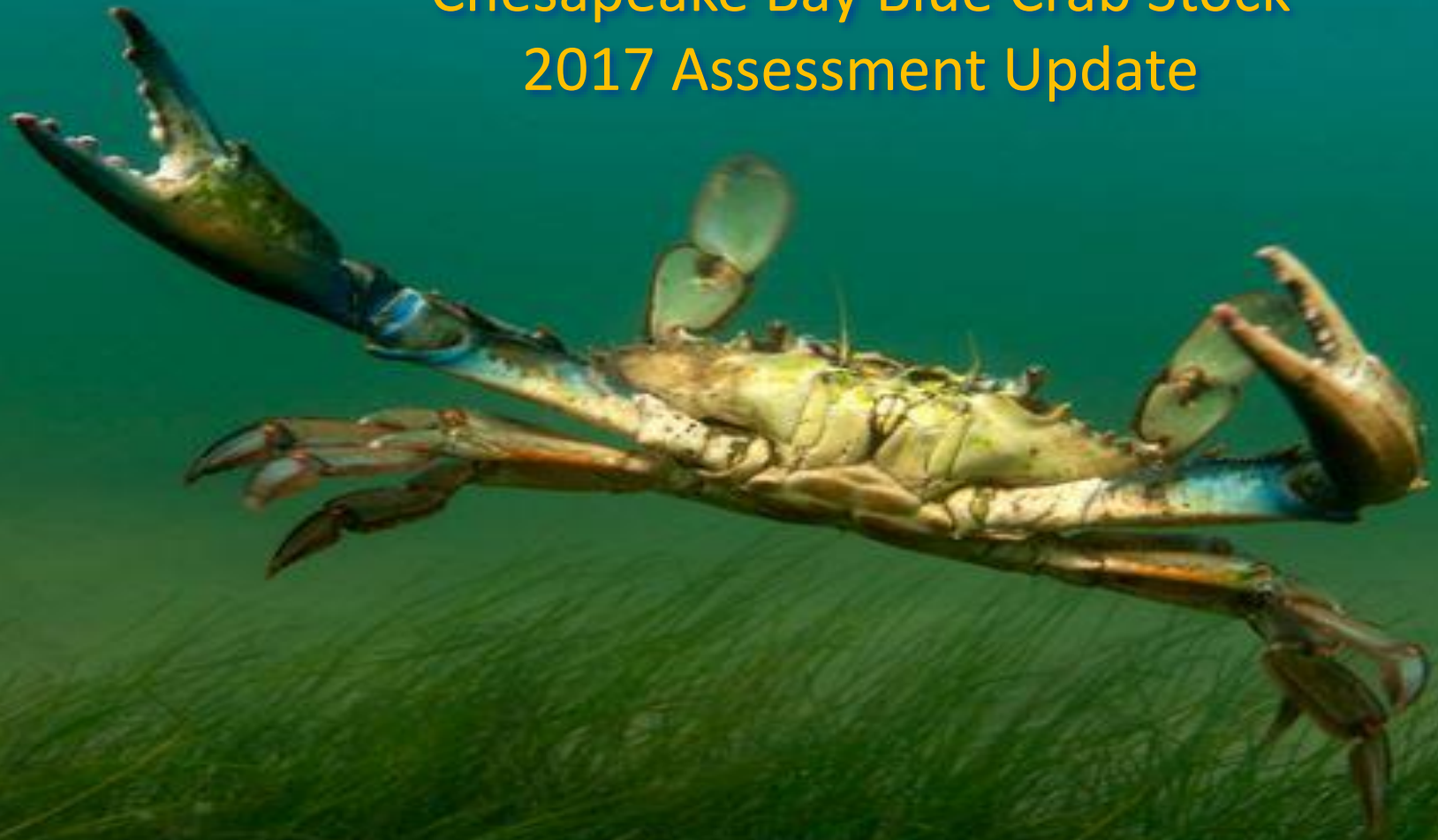


Sustainable Fisheries Goal Implementation Team  
December 18, 2018  
Newport News, Virginia



## Chesapeake Bay Blue Crab Stock 2017 Assessment Update



# Overview



- Background
- Model inputs
- Sensitivity runs
- Update results
- Next Steps

# Model Background



Update of 2011 benchmark, peer-reviewed assessment model Miller et al. 2011

Sex-specific, catch multiple survey model

Update adds survey data through 2017 and harvest data through 2016

# Model Inputs



## 1. Harvest

### 2. Maryland Trawl Age 0 (sexes combined)

Age 1+ female

Age 1+ male

### 3. Virginia Trawl

Age 0 (sexes combined)

Age 1+ female

Age 1+ male

### 4. Winter Dredge Age 0

Age 1+ female

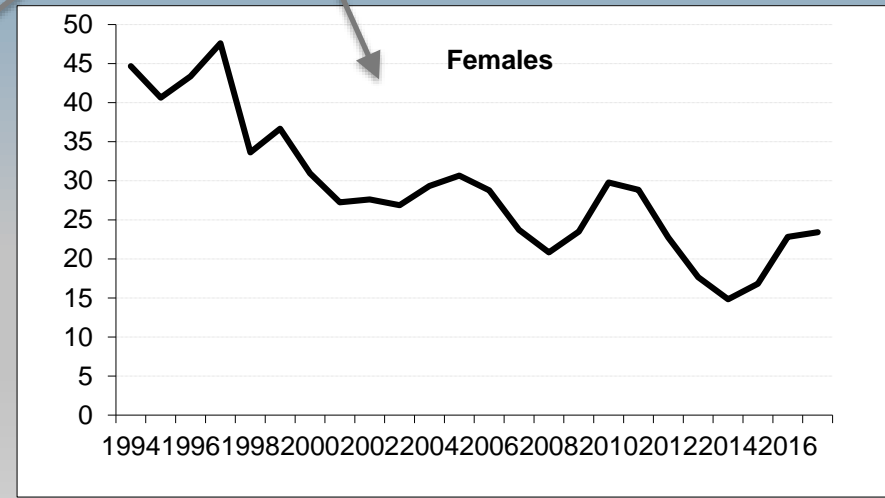
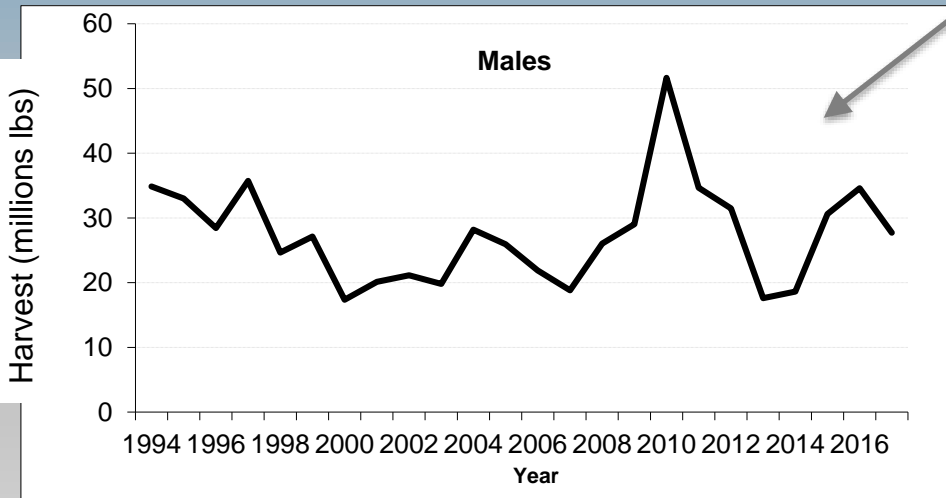
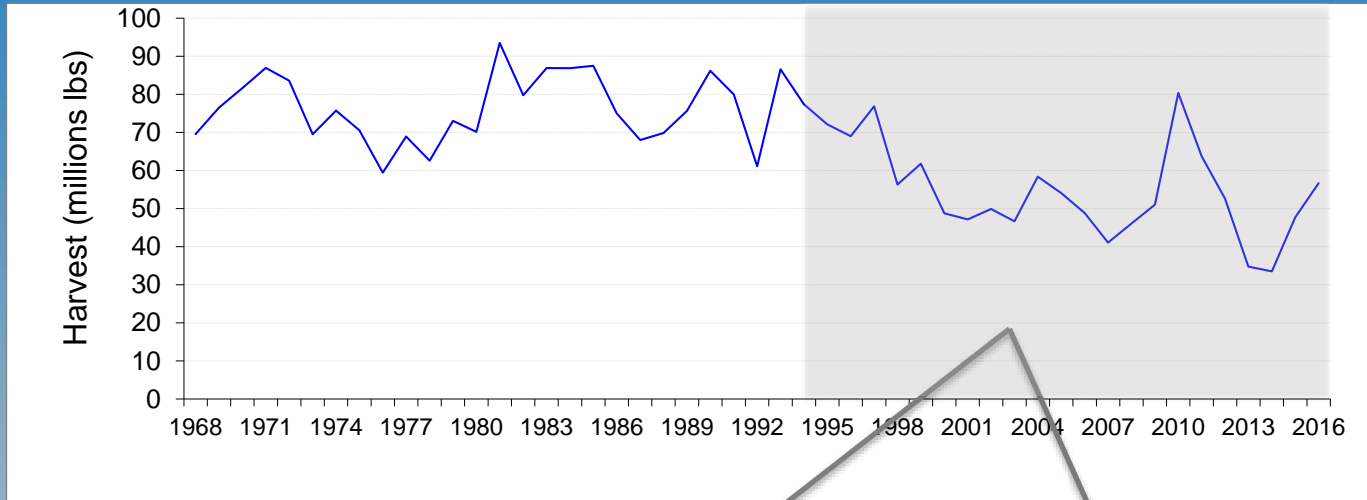
Age 1+ male

# Model Inputs: Harvest

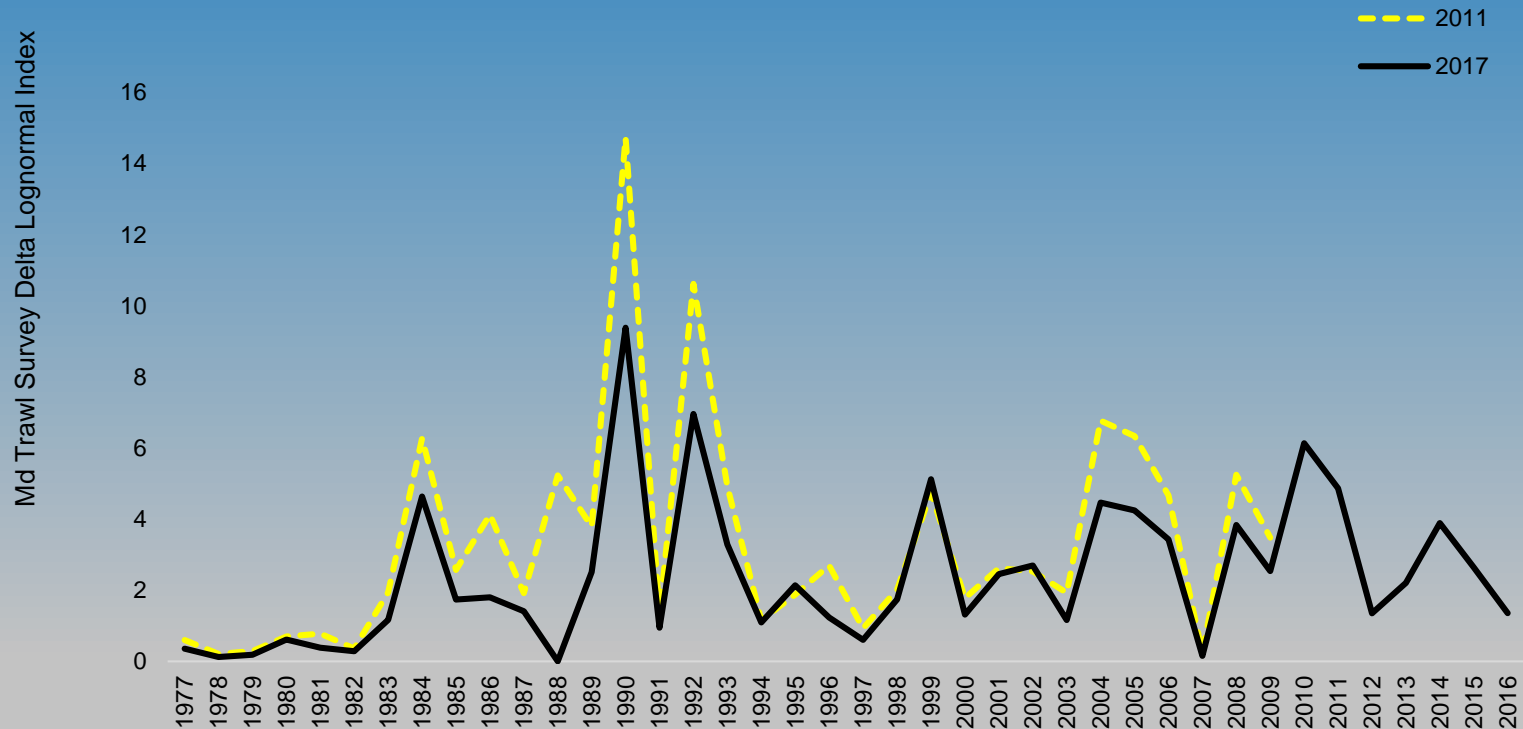


Baywide sex-specific catch available beginning in 1994

For model input harvest in pounds was converted to numbers using survey weights. Trends are the same.

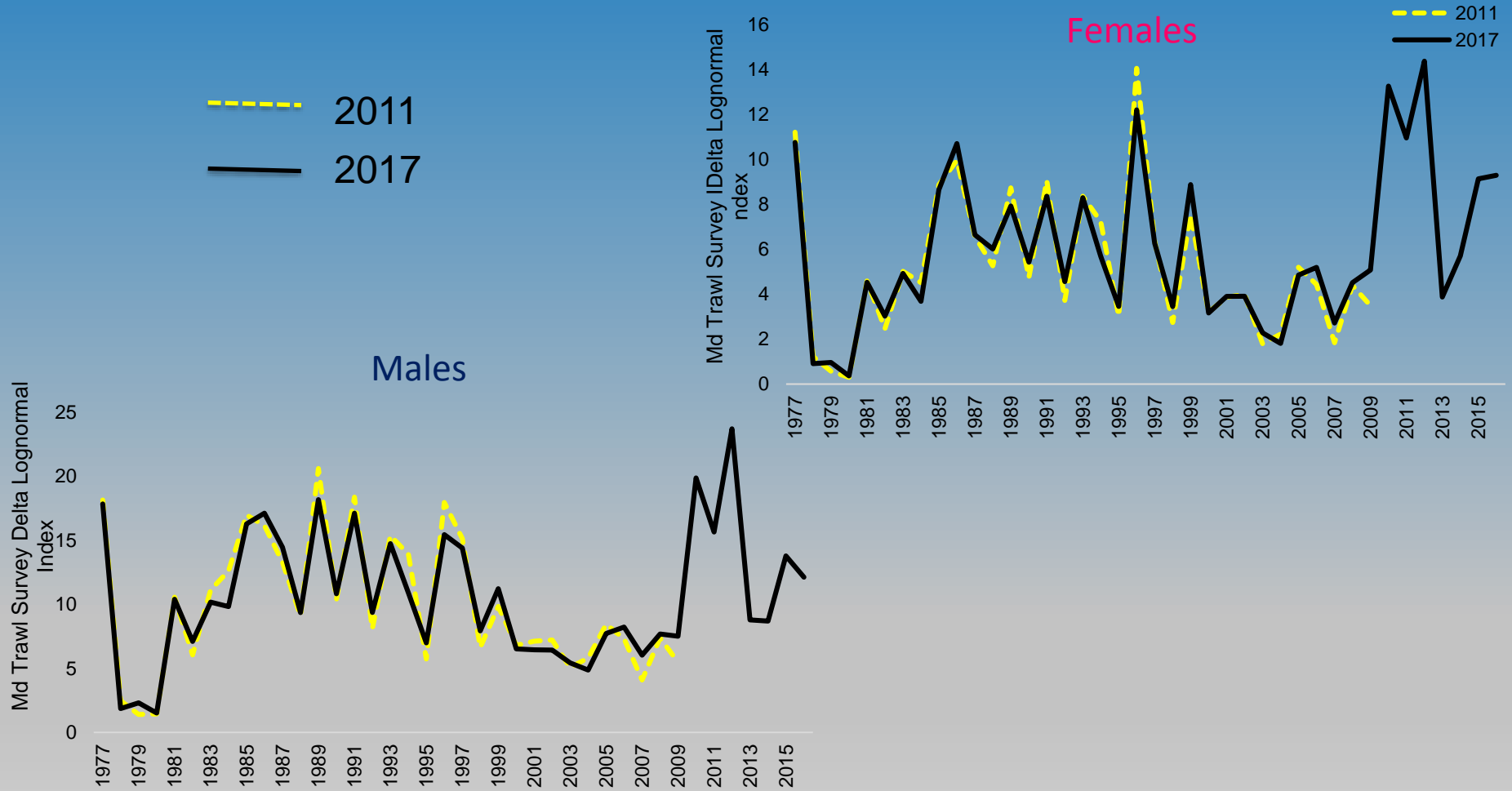


# Model Inputs: Maryland Trawl Age 0, Sexes Combined

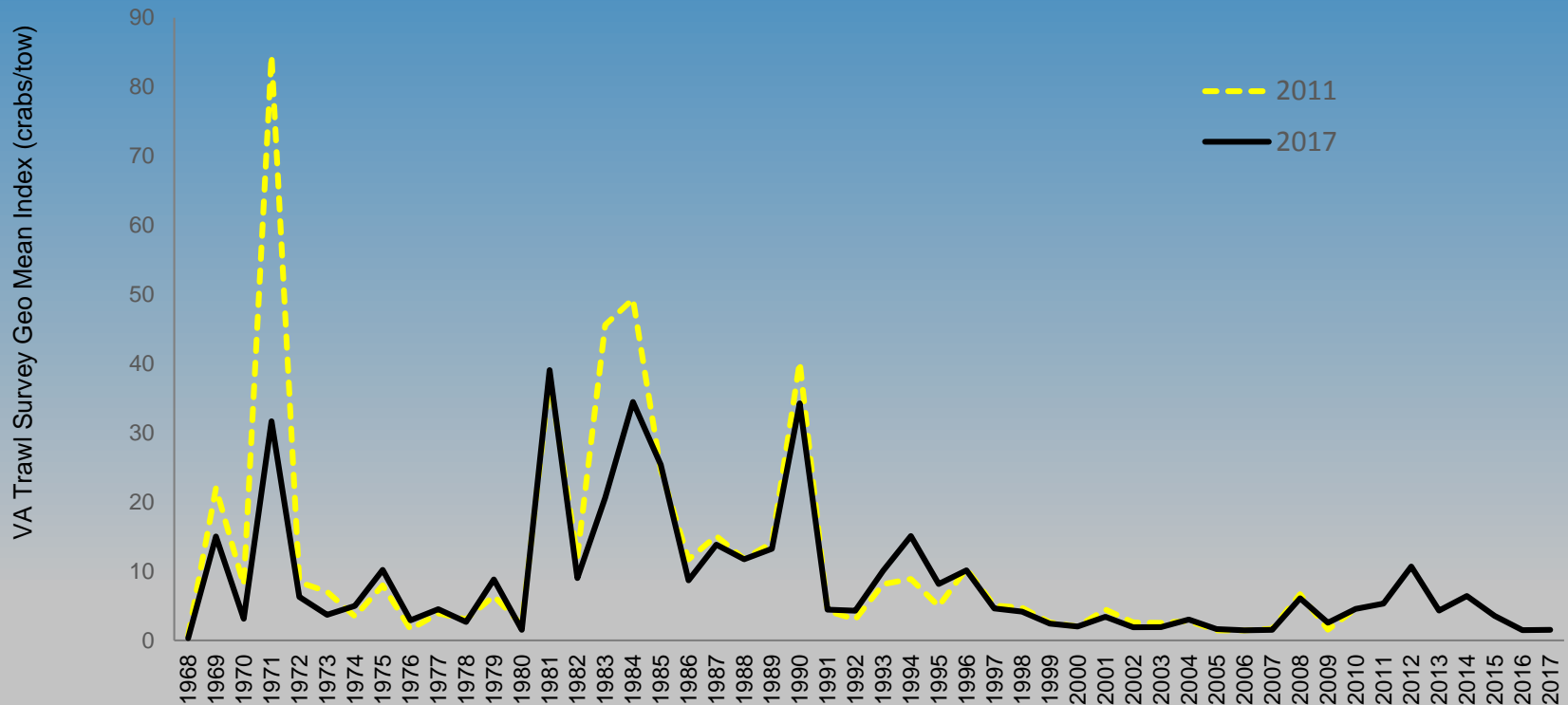


# Model Inputs: Maryland Trawl

## Age 1+



# Model Inputs: Virginia Trawl Age 0, Sexes Combined



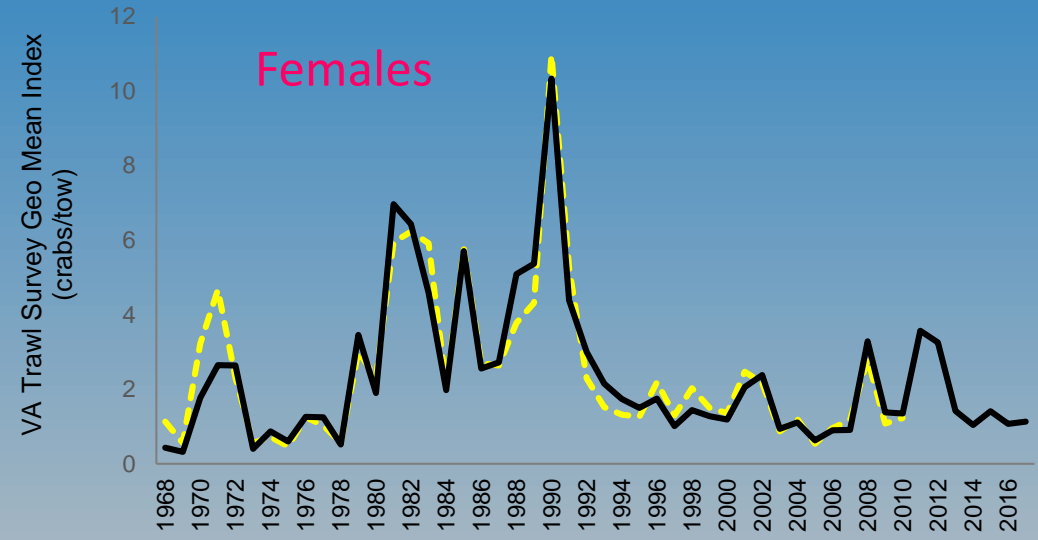
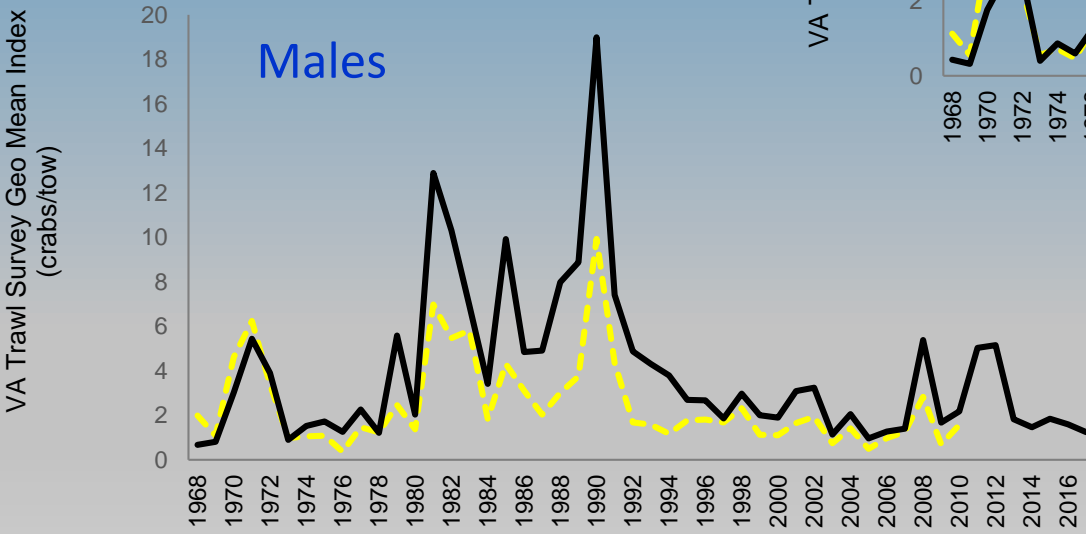


# Model Inputs: Virginia Trawl

## Age 1+

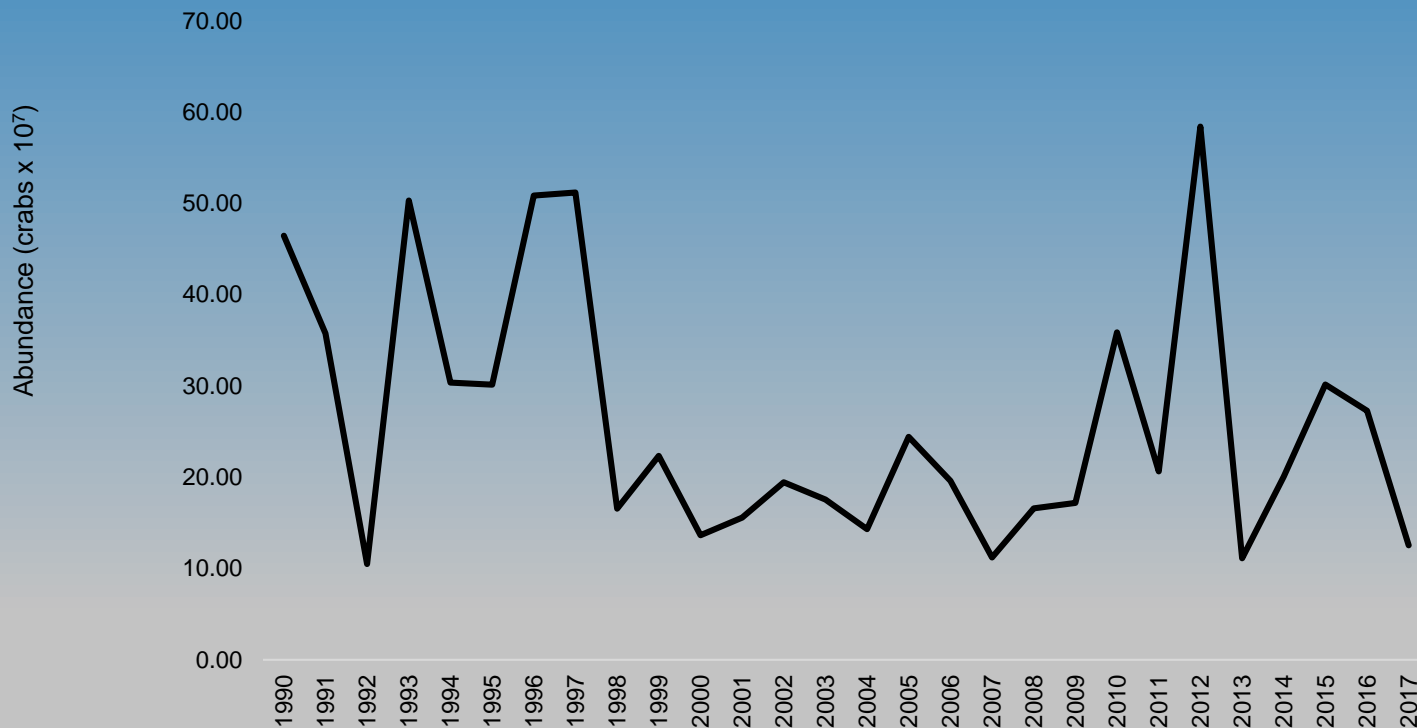


--- 2011  
— 2017



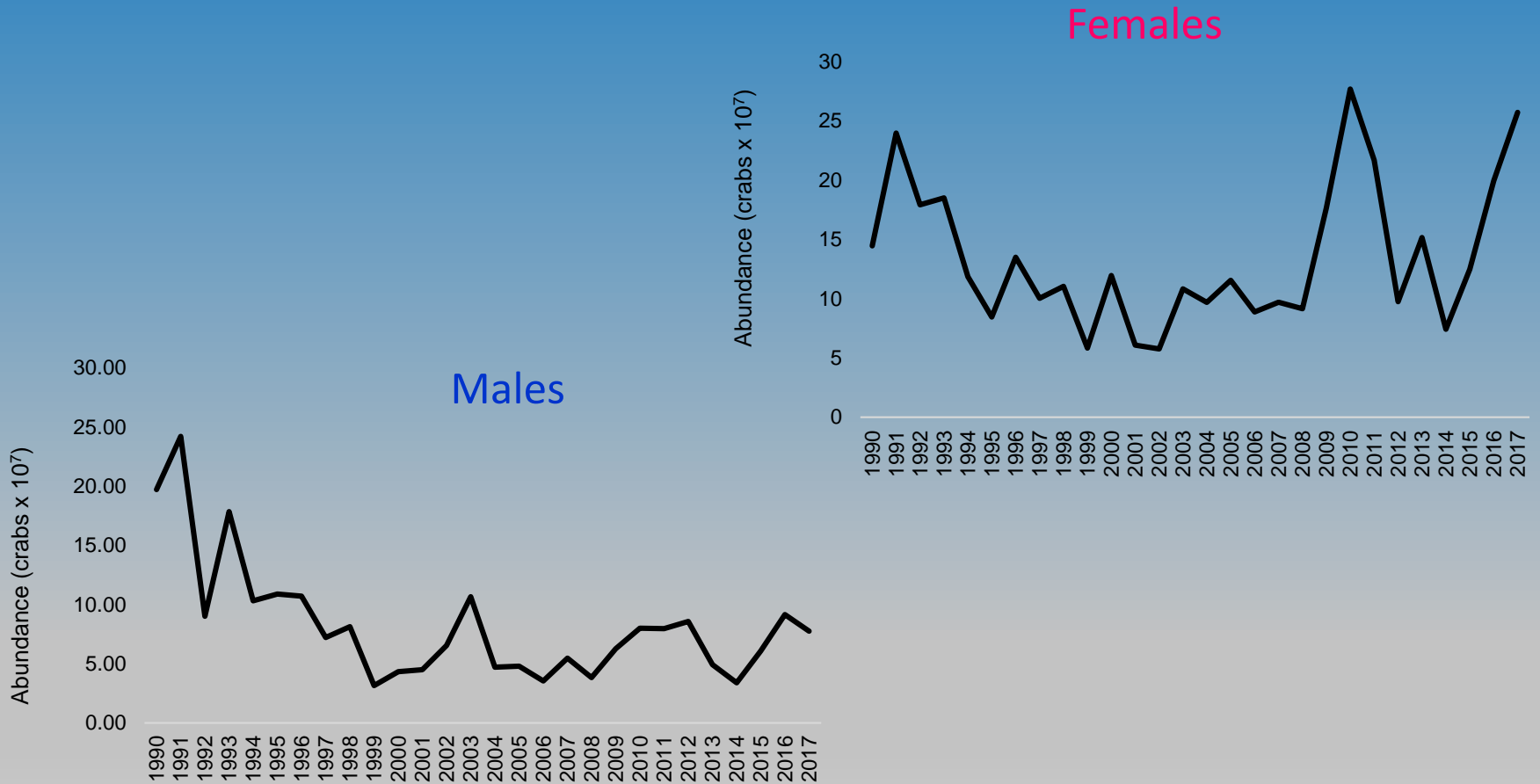
# Model Inputs: Winter Dredge Survey

## Age 0, Sexes Combined



# Model Inputs: Winter Dredge Survey

## Age 1+



# Model Inputs: Parameters



Variable	2011 Assessment	Range Tested in Update
Natural Mortality ♂	0.9	0.6 - 1.5
Natural Mortality ♀	0.9	0.6 - 1.2
Age 0 Recruitment Fraction	0.60	0.44 -1.0
Female Fraction at Age 0	0.52	0.50
Recreational Harvest	0.08	0.08 - 0.12

# Sensitivity Runs



Survey Effects (Removed surveys)

**Biological Parameters:**

**Natural Mortality (male and female)**

**Juvenile Sex Ratio**

**Recruitment fraction of juveniles**

**Gear Efficiency**

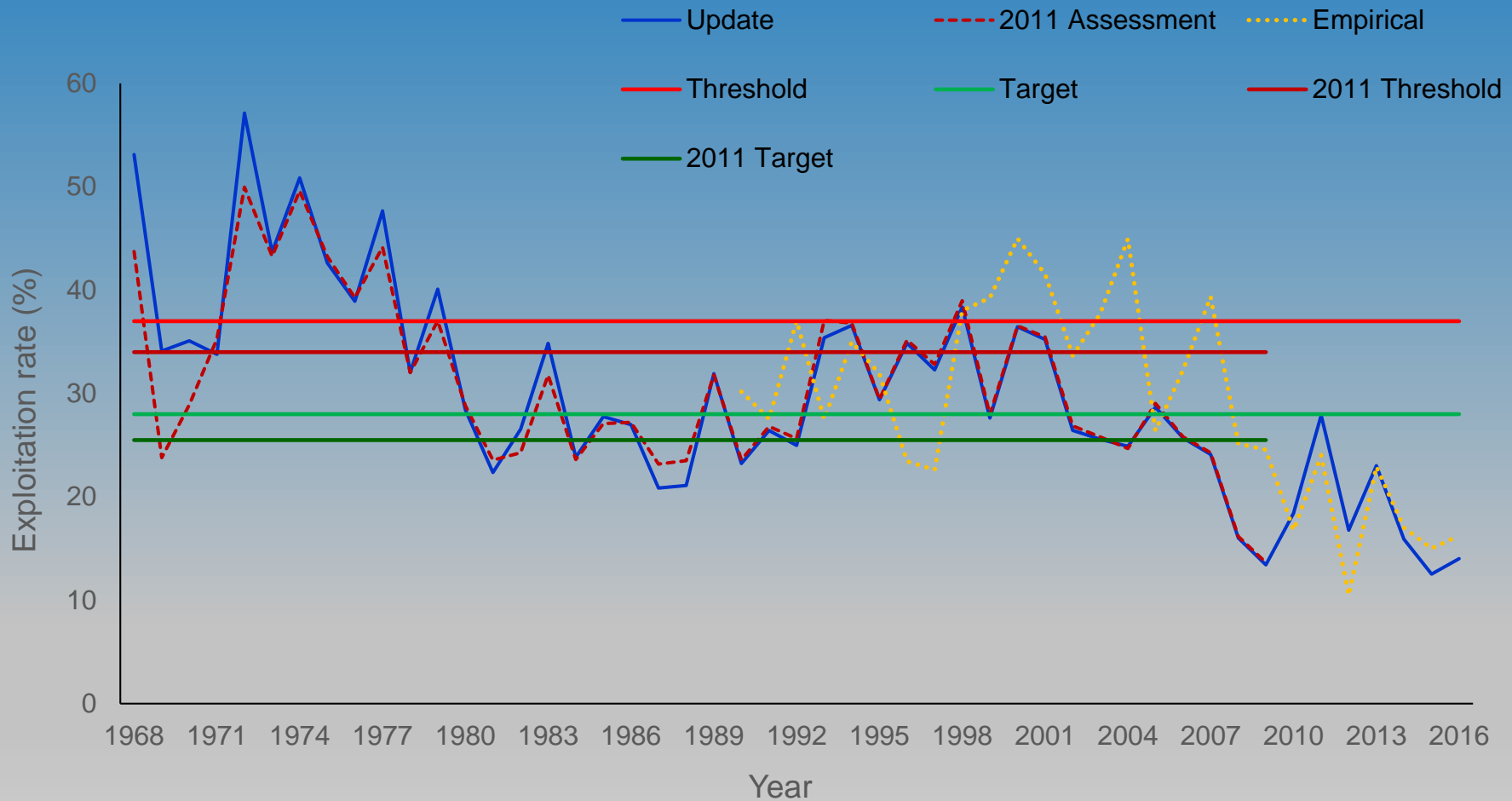
# Sensitivity Runs



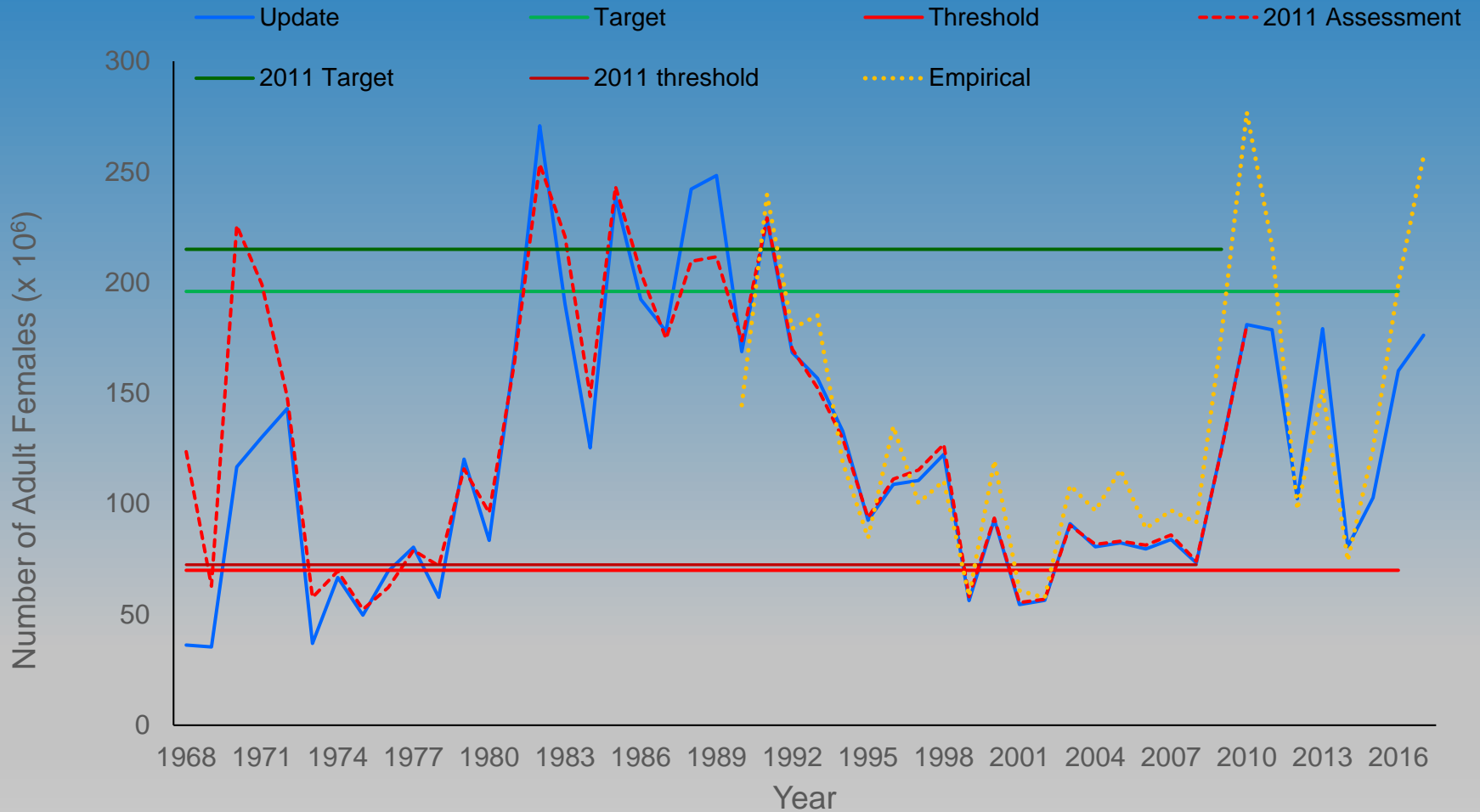
Sensitivity runs had minimal effect on model estimates of reference points and stock status, but model fits improve somewhat if:

- M is higher on males than on females
- The female fraction at age 0 is increased from the observed 0.52 to 0.6
- Gear efficiency is set to 0.2 which is the average for all vessels over the time series.

# Model Results: Exploitation Fraction



# Model Results: Female Abundance





# Model Results: Biological Reference Points



		2011 Assessment	Update	Terminal Year (2016) Estimate
Exploitation Fraction (%)	Target	25.5	28	14
	Threshold	34	37	
Female Abundance (millions of crabs)	Target	215	196	176
	Threshold	70	72.5	

# Next Steps



Update report completed in January – out for CBSAC review

Adoption of reference points from update

Development of decision rules

# Next Steps: Thoughts about a benchmark



Not urgently needed because-

- 1) no new 'game changing' information on crab life history or new integrated analyses that would prompt a benchmark
- 2) New data in update had little impact to estimates of reference points or to stock status
- 3) no glaring management need
- 4) state scientists will continue work to improve assessment model with updated data and analyses - send out for desk review if new model formulation is developed

# Questions?

