

# Impacts on Vessel Fishing Revenue

# Relative Change in Fishing Revenue

- Input from area closure model
- Expansion to vessel-level total fishing revenue
- Estimation of vessel-level total revenue change
- Reporting categories
- Expansion to total sub-regional revenue change

# Input

- Math programming model assumed to be a sample of groundfish activity
  - As long as an estimate of relative change not a problem with respect to groundfish revenue
- Math programming model does not include revenue from other fisheries
  - Could misrepresent actual impacts depending on dependence on groundfish for total fishing income
  - RFA requires consideration of impact from the perspective of total business income

# Total Vessel-Level Fishing Revenue (Baseline)

- Estimate observed 1998-2001 average revenue by vessel from dealer data
  - Average revenue from non-groundfish trips
  - Average revenue from groundfish on groundfish trips
  - Average revenue from non-groundfish on groundfish trips
  - Calculate ratio of non-groundfish revenue to groundfish revenue on groundfish trips

# Vessel-Level Revenue Change

- Step 1: Calculate percent change in groundfish revenue from math programming model

$$\text{DeltaGF} = (\text{GFVAL1} - \text{No Action}) / \text{No Action}$$

# Vessel-Level Revenue Change (cont.)

- Step 2: Apply result from Step 1 to baseline groundfish revenue

$$\text{NewGF} = (1 + \text{DeltaGF}) * \text{BaseGF}$$

# Vessel-Level Revenue Change (cont.)

- Step 3: Apply the result of Step 2 to the baseline ratio of non-groundfish revenue to groundfish revenue

$$\text{NEWNonGF} = \text{NewGF} * \text{Ratio}$$

# Vessel Level Revenue Change (cont.)

- Step 4: Sum baseline revenue from non-groundfish trips and the result of Steps 2 and 3 to obtain new total revenue

$$\text{NewTot} = \text{BaseNonGF} + \text{NewGF} + \text{NewNonGF}$$



# Vessel-Level Revenue Change (cont.)

- Step 5: Calculate percent change in total fishing income

$$(\text{NewTot} - \text{BaseTot})/\text{BaseTot}$$

# Reporting Categories

- Dependence on Groundfish
- Groundfish Sales
- Total Sales (IRFA)
- Vessel length
- Gear
- Gear/Length
- Home Port State
- Port Groups

# Sub-Regional Revenue Change

- Relative revenue change based on a sample of vessels landing groundfish
- Need to expand to population
  - (1) Estimate 1998-2001 average total revenues from all trips landing groundfish by gear sector and sub-region

# Sub-Regional Revenue Change (cont.)

- (2) Aggregate baseline total revenue on groundfish trips by gear sector and sub-region (from sample)
- (3) Aggregate new total revenue on groundfish trips by gear sector and sub-region
- (4) Divide (3) by (2)
- (5) Multiply (4) by (1)
- (6) Subtract (5) from (1)
- Result from (6) was used as estimated direct impact on commercial fishing output in I/O model