

Bridge DATA: Ghostbusting in the Chesapeake

<http://www.vims.edu/bridge/ghostpots.html>



ANSWER KEY

Gear Data

- How many total items were removed from water? **19,094**
- Which item was removed in the greatest numbers? **Crab pots**
- Calculate the percentage-of-the-total for each of the gear types and other debris
Crab pot = 83.6% **Eel pot = 1.1%** **Other debris = 3.8%**
Peeler pot = 11% **Nets = 0.5%**
- Calculate the percent change in each gear type between the two years. Be sure to indicate whether the change is positive or negative.
Crab pot = +2.9% **Eel pot = +17.7%** **Other debris = +180.1%**
Peeler pot = +54.0% **Nets = -40.3%**

Catch Data

- What two animal species were caught in the highest numbers in both 2008-2009 and 2009-2010?
 - Blue crab (male + female)**
 - Oyster toadfish**
- What percentage did each of these two species account for in each year's total catch?
 - 2008-2009
 - (39% + 29%) = 68%**
 - 18%**Total % = **(68% + 18%) = 86%**
 - 2009-2010
 - (46% + 36%) = 82%**
 - 8%**Total % = **(82% + 8%) = 90%**
- Calculate the percent change in the number caught of these two species between the two years. Be sure to indicate whether the change is positive or negative.
 - $[(82\% - 68\%) / 68\%] * 100 = +20.6\%$**
 - $[(8\% - 18\%) / 18\%] * 100 = -55.6\%$**

Catch per Unit Effort (CPUE) Data

- Fill in (a) and (b) in the table below to calculate the average number of pots recovered per waterman during the two project-years:

Table 1. Number of watermen and total pots removed.

| | 2008-2009 | 2009-2010 |
|---------------------------|-----------------|-----------------|
| Participating watermen | 58 | 66 |
| Total pots removed | 8790 | 9479 |
| Pots removed per waterman | a) 151.6 | b) 143.6 |

Economic Data

- Based on Table 1 above, how many total pots (no nets) were recovered during the two years?
(8790 + 9479) = 18,269 pots
- If we assume that 50 crabs per season are caught in each ghost pot, how many crabs are saved, per season, by removing two year's worth of ghost pots?
(18,269 * 50) = 913,450 crabs
- If 6.6 crabs yields 1 kilogram of crabmeat:
 - How many kilograms of crabmeat can be potentially saved for the future years' harvest?
(913,450 / 6.6) = 138,401.5 kg of crabmeat

- ii. Convert the kilograms of crabmeat to pounds? (1kg=2.2 pounds)
*(138,401.5 * 2.2) = 304,483.3 pounds of crabmeat*
12. Crabmeat sells, on average, for \$1.00 per pound (wholesale). How much is the saved crabmeat potentially worth? *(304483.3 x \$1.00) = \$304,483.30*

Discussion *(Provided answers may not be comprehensive)*

1. Based on Figure 1, why do you think there was an increase in the removal of most types of gear in Year 2 of the project?
Possible answers: 8 additional watermen in Year 2; More shallow-draft vessels used; Most watermen now had one year of experience/practice (smaller learning curve)
2. Why was a substantially higher number of crab pots removed than any other type of gear in both years of data?
Possible answers: More crab pots are used and subsequently lost/abandoned each year than other gear types; Crab pots are less expensive than nets, so they may be left behind more; Crab pots are easier to locate on side scan sonar
3. Based on the available data, what might you expect the graph to look like if 2010-2011 data were added?
Possible answers: If following the current trend, we should see increases in all pot data, and even or lower numbers for net data
4. If more shallow areas were the focus in Year 2 of the project, why might this explain the lower number of nets recovered in Year 2?
Possible answers: Nets typically are not fished in shallow areas/winding creeks where boat traffic is higher
5. Based on Figure 2, why do you think the watermen recovered more female blue crabs than male blue crabs in both years?
Possible answers: The Virginia blue crab population, in general, tends to be dominated by females as the females migrate to high salinity waters in order to spawn. Conversely, in areas of less-salty water (higher up in the Virginia tributaries and the Maryland portion of the Chesapeake Bay) we tend to catch more males.
6. What is it about the toadfish and whelk's life histories that make them susceptible to being caught in the different types of crab and eel pots?
Possible answers
Oyster toadfish: These bottom dwellers move across the Bay floor in constant search of shelter and food; crab pots provide both.
Whelks: The main reason whelks were found in high numbers is food. As fish and crabs get caught in the pots, the whelks move in to prey on captured and dead/decaying animals (carrion). The shelter pots provide the oyster toadfish is of less importance to any of Chesapeake Bay's whelk species.
7. Describe the advantages and disadvantages of the derelict crab pot removal program.
Possible answers
Advantages: Removal of marine debris; Less bycatch; Watermen earn wages on the water
Disadvantages: Removed pots are used as habitat (oysters, etc.); Although precautions were taken to reduce damage, grappling Bay floor can still damage the habitat
8. Discuss additional ideas for removing derelict crab posts and other marine debris.
Free response