

Victoria Carlson, Sarah Kapelner,
Michael Josephs, Christopher McConnell, Johnny Hernandez
Feed the World: Prof. Boudreau, Prof. Wobbe

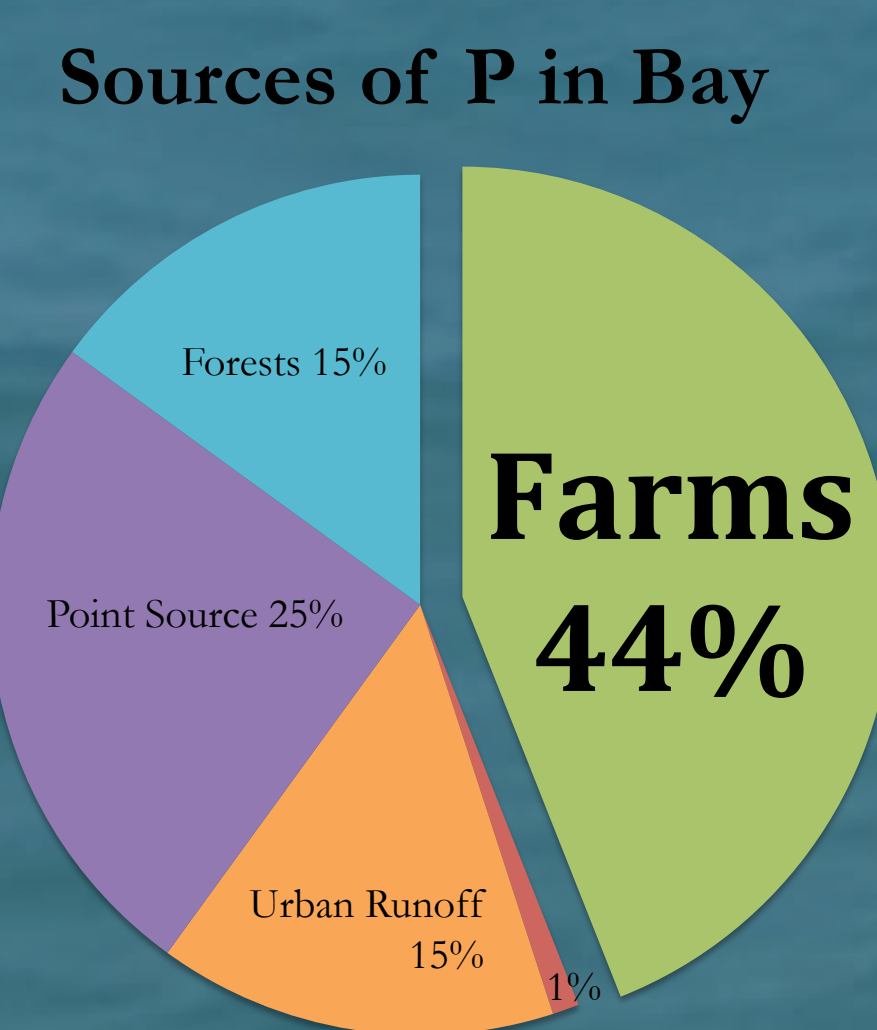
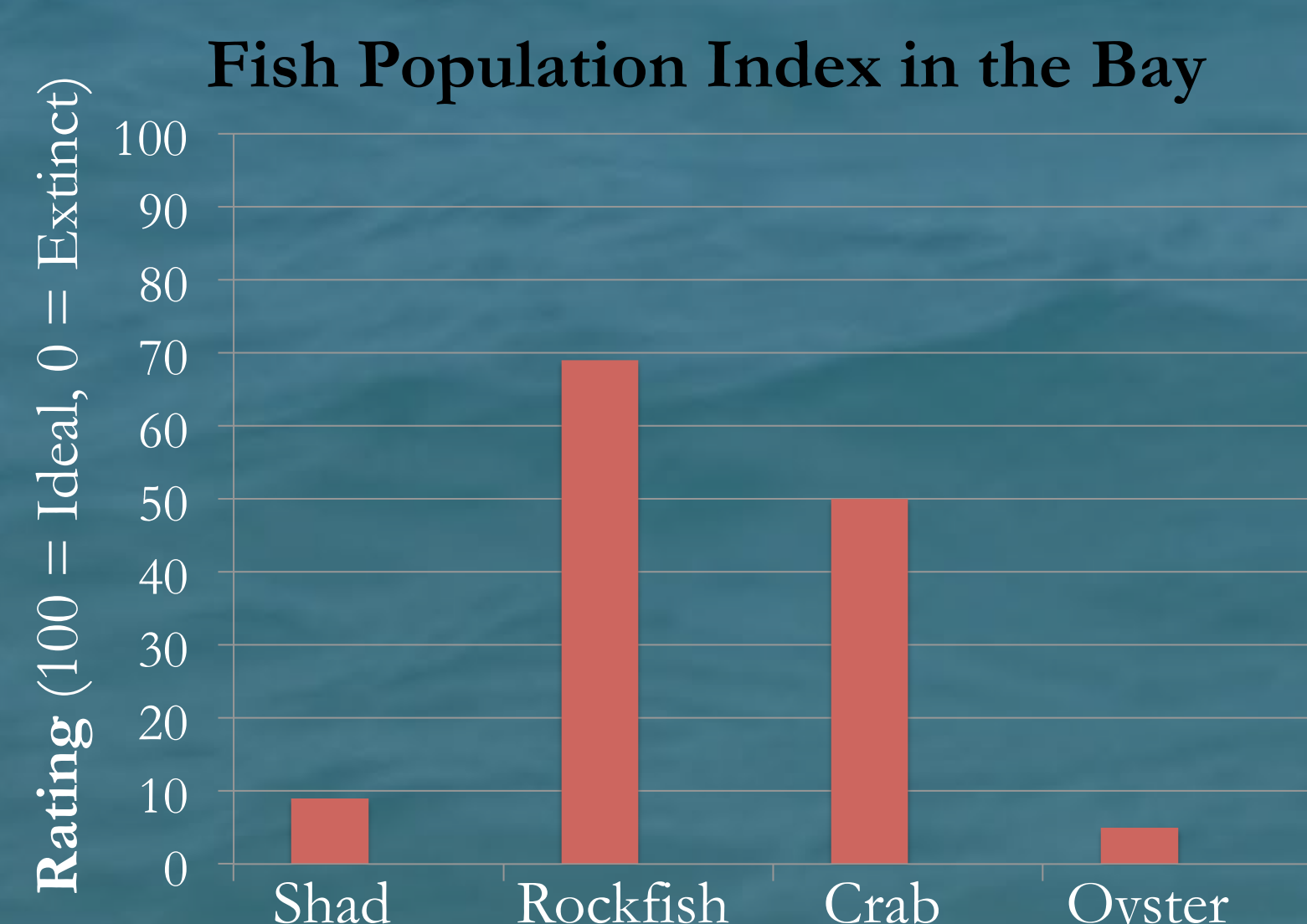
Let's save the "immense protein factory"
that is the Chesapeake Bay

Background

“The Bay is still a system dangerously out of balance — the U.S. Environmental Protection Agency (EPA) lists the Chesapeake and its tidal tributaries as impaired. Health departments still caution people to stay out of the water for 48 hours after a heavy rain. Fish consumption warnings continue. Human health is at risk. And tens of thousands of jobs have been lost in fishing and related industries alone. A Bay Health Index of only 31 versus a score of 100 when Colonial settlers arrived is a sad testament to how we have treated a National Treasure. There is a great deal left to do.”

- William Baker, President of the Chesapeake Bay Foundation, 2010

- The Chesapeake is the largest estuary and the third largest source of fish in the US
- 18,000,000 lbs. of phosphorus enters the Bay every year (the allotment is only 12,000,000 lbs.)



Amount of P fed and excreted by a lactating cow producing 20,000 lbs milk in 305 days, and the amount of land required to effectively use manure P.

Dietary P concentration	Estimated supplemental P	Manure P	Land area needed to recycle manure P
%	lbs/lactation	lbs/lactation	Acres
.30	0	34.8	1.3
.40	7.5	42.3	1.6
.48	19.6	54.5	2.0
.55	30.2	60	2.4

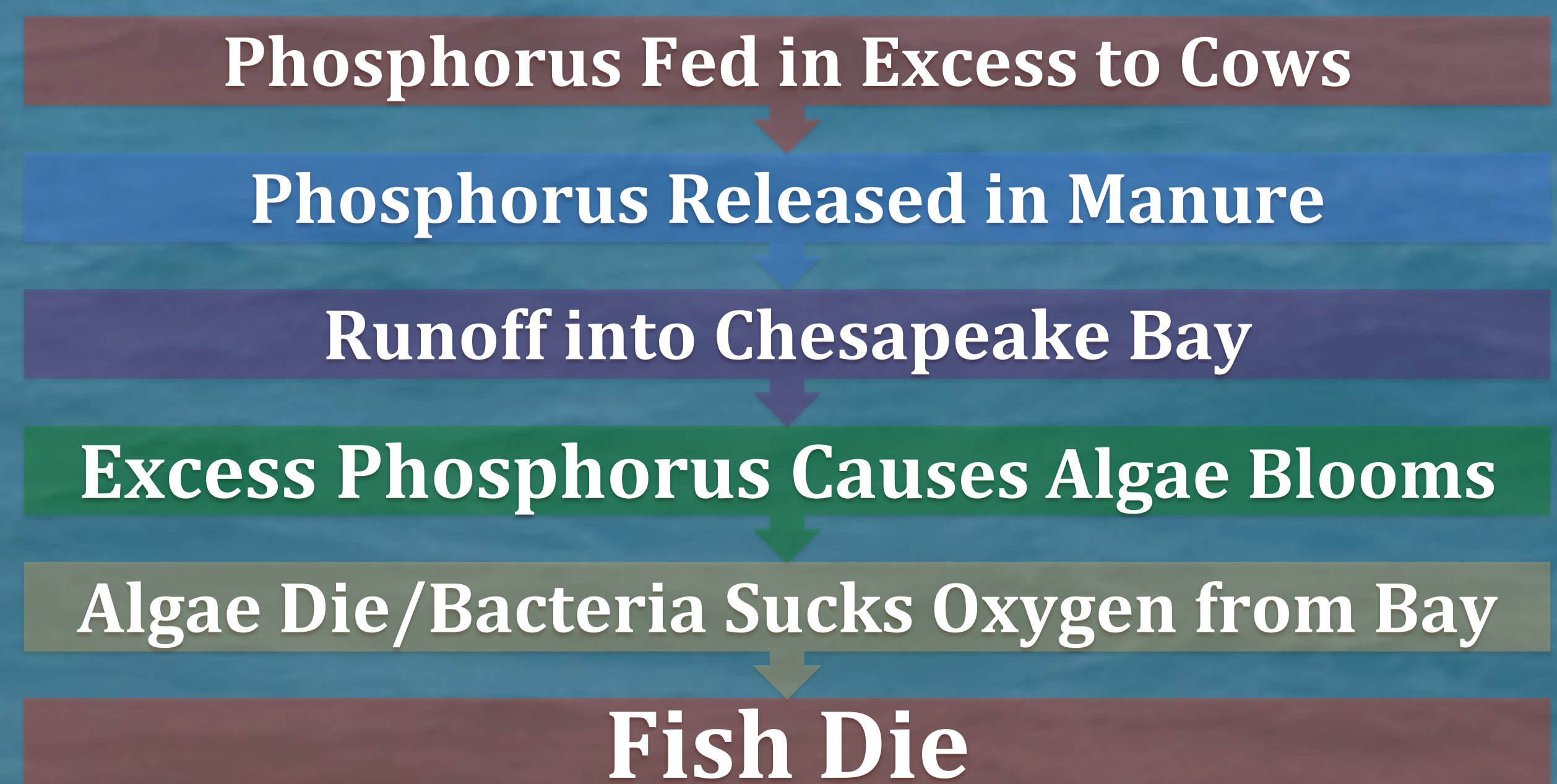
Goal



Increase Fish Populations in The Bay

Problem

Fish populations and consequently fishing industries have been significantly reduced by dead zones in the Chesapeake Bay. Our project focuses on the effects of phosphorus runoff from dairy farms as the source of dead zones.



Solution/Assessment

Solution:



Assessment:

- Review farmer surveys before and after our solution is put into effect to see if education was successful.
- Conduct before and after tests of cow manure to see if phosphorus is being reduced.
- Review water samples taken by the Chesapeake Bay Foundation over the next five years to see if water conditions are improving.



The Cost of Dead Zones IS Dead Fish



Chesapeake Bay Foundation

Saving a National Treasure



Algae Bloom Causing A Dead Zone



Oysters: A Threatened Species in the Bay

Cost/Benefit

Costs

Farmers lose phosphorus in feed as yield insurance.

If the government gives incentives to farmers using reduced phosphorus, they will lose tax dollars.

Money associated with brochures, surveys, and mailings.

Benefits

Farmers are actually using too much phosphorus on average. \$10-\$15 per cow per year could be saved!

New tax dollars will come from a thriving fishing industry.

Organizations who wish to partner with us will be fulfilling their missions by restoring the Chesapeake Bay.

Consider This

The issue of dead zones in the Chesapeake Bay is just one example of a trend seen across the world and especially all down the East Coast.

If effective in the Chesapeake, our solution could play a large role in decreasing dead zones in other areas.



US East Coast – Dead Zones

References

- Retrieved December <http://stat.chesapeakebay.net/?q=node/130>
Retrieved December <http://www.cbf.org/>
Retrieved December <http://www.chesapeakebay.net/>
Bosch, D. J., Wolfe, M. L., & Knowlton, K. E. (2006). Reducing phosphorus runoff from dairy farms. *Journal of Environmental Quality*, 35(3), 918-927.
Larry D Satter. (2011). Phosphorus in phosphorus out. *Beefman*, 4(5), 13.
Powell, J. M., Satter, D. L., & USDA. ARS. Retrieved from http://www.ars177.ars.gov/Document/BMP_dietary_phosphorus.pdf
Images:
Hance. (Photographer). (2010). *World dead zone*. [Web Photo]. Retrieved from http://www.monaghan.com/2010/0722/hance_deadzone_nuts.html
(2011). *Fishing boat at sea in Panama*. (2011). [Web Photo]. Retrieved from http://sage-thymus.com/Gallery/Albums/CoastalPanama/Fishing_Boat_1728.jpg
(2011). *Vast ocean*. (2011). [Web Photo]. Retrieved from http://2.bp.blogspot.com/_d8KmoS_u_Y/TWID97faH1I/AAAAAAAAACK/9mPO_kph1wo/s1600/IMG_2473.JPG
(n.d.). *Dead fish*. [Web Photo]. Retrieved from http://toxics.usgs.gov/photo_gallery/photos/emcr_cemer_cyanobac/Deadfish_BinderLakeLA_7_1.jpg
(2011). *Oysters*. (2011). [Web Photo]. Retrieved from <http://fishshippings.blogspot.com/2011/09/oysters-and-ocean.html>
(2010). *Dead fish*. (2010). [Web Photo]. Retrieved from http://blogs.kansascity.com/crime_scene/2010/04/18/