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# Trophic Cascades in Salt Marsh Ecosystems

THIS IS A PART OF **Ecology of Rivers and Coasts—Food Webs and Human Impacts**



### Summary

Ecologist Brian Silliman uses manipulative field experiments to reveal that salt marsh ecosystems are under top down control from consumers and predators.

SCIENTISTS AT WORK;(Duration: 10 min 01 sec)



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Salt marshes were once considered examples of bottom-up regulation in which the ecosystem is determined by abiotic factors and nutrient availability. Ecologist Dr. Brian Silliman observed that the salt marsh was often covered with snails—what were they eating? Through a series of cage experiments, Dr. Silliman demonstrated that the snails control the amount of marsh grass by facilitating fungal infection. He also showed that blue crabs control the number of snails and therefore protect the marsh grass from overgrazing. This is an excellent example of confronting a long-held theory with data in order to improve and refine our understanding of the natural world.

Date Created 05/05/2017  
Date Modified 05/05/2017

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136 KB



# Connecting the Content

What concepts and processes are discussed in the video about species biomass and productivity?



## UNDERSTANDING GLOBAL CHANGE ICONS

Agricultural activities	Burning of fossil fuels	Deforestation/reforestation	Distribution of continents & oceans
Earth's spin, tilt & orbit	Extraction of resources	Fishing & hunting	Freshwater use
Habitat loss/restoration	Innovation	Invasive species	Meteorite impact
Mountain building	Renewable energy	Solar radiation	Pollutants & waste
Population growth	Urbanization	Volcanism	Absorption/reflection of sunlight
Atmospheric circulation	Carbon cycle	Climate	Earth's internal heat

<http://www.hhmi.org/biointeractive/trophic-cascades-salt-marsh-ecosystems>

<https://undsci.berkeley.edu/article/scienceflowchart>

1. Working in pairs, identify the 3-4 measurable changes (blue icons/ words) most relevant to Brian Silliman's research from your icon stack.





 Species Interactions

 Populations

 Productivity & biomass

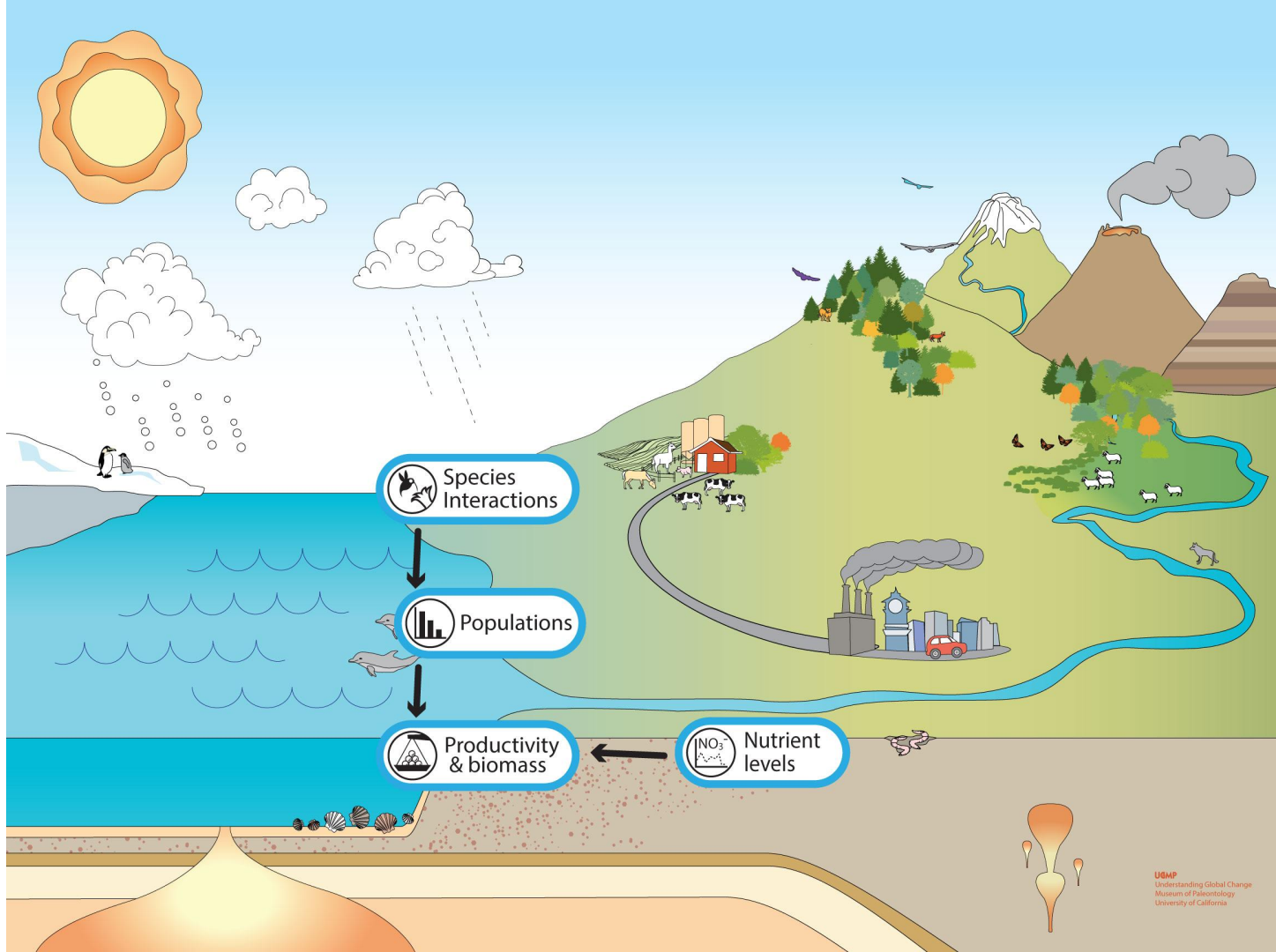
 Nutrient levels



1. Identify the 3-4 **measurable changes (blue icons/ words)** *most* relevant to Brian Silliman's research from your icon stack.
2. Place the icons you selected on the storyboard.
3. Draw arrows to represent cause/effect, inputs/outputs, relationships, etc.
4. Label the arrows to explain the connections.



USMP  
Understanding Global Change  
Museum of Paleontology  
University of California  
This module is funded by the  
National Science Foundation  
Grant (11-111311)



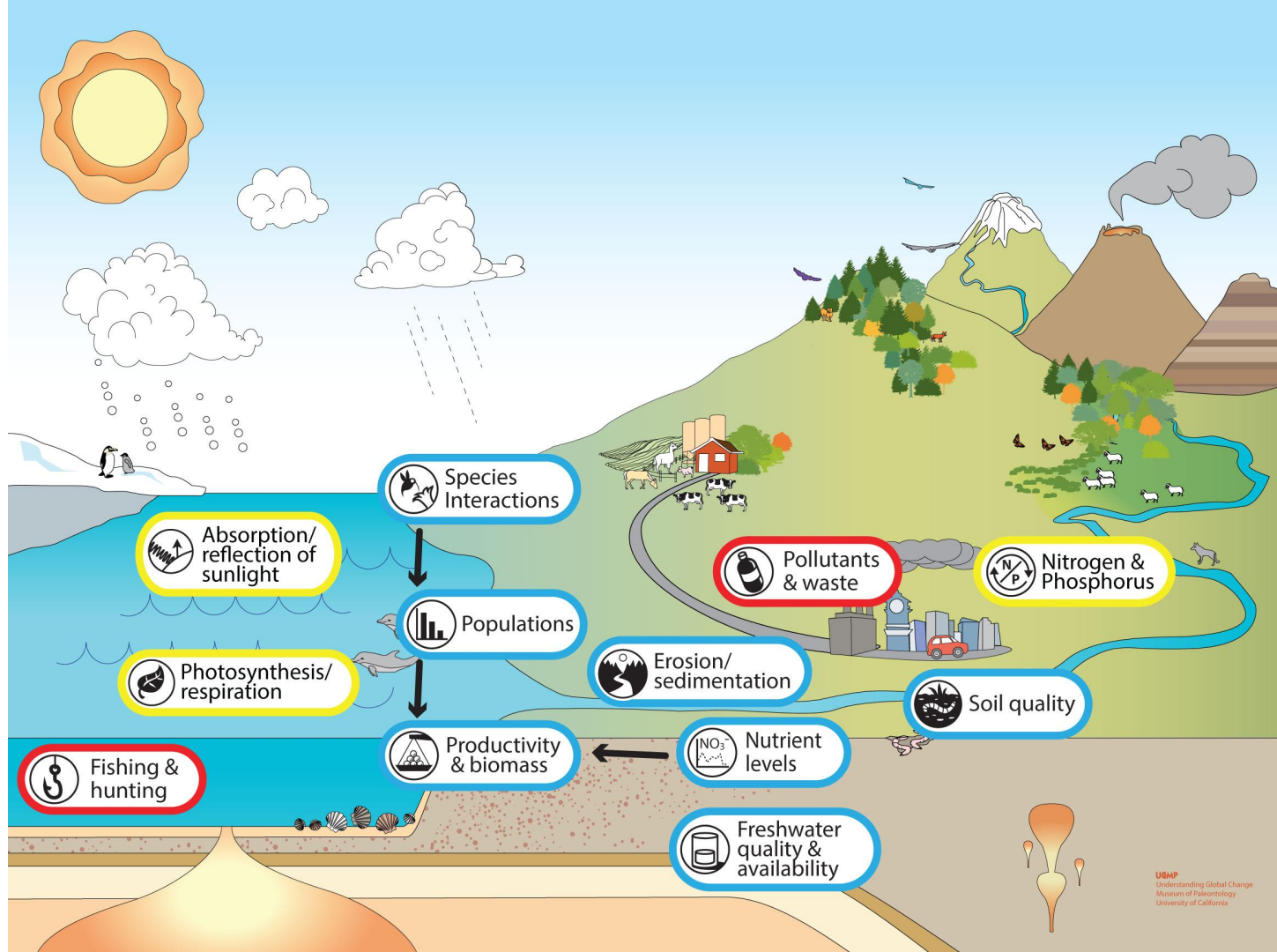
1. Identify the 3-4 **earth systems** (yellow icons/words) *most* relevant to Brian Silliman's research from your icon stack.
2. Place the icons you selected on the storyboard.
3. Draw arrows to represent cause/effect, inputs/outputs, relationships, etc.
4. Label the arrows to explain the connections.



1. Identify the 3-4 **causes of change** (red icons/ words) **most** relevant to Brian Silliman's research from your icon stack.
2. Place the icons you selected on the storyboard.
3. Draw arrows to represent cause/effect, inputs/outputs, relationships, etc.
4. Label the arrows to explain the connections.







# Collaboration

- At your tables, share the storyboard for your coastal region and explain the connections between topics.



- What are the differences between the storyboards?

