

Dr. Christopher R. Hardy
Biology, Millersville University

Final Exam Study Guide for Case Studies in Human Ecology

I. Guam ALS-PDC Case Study

Week 1 Discussion (Feb 1):

Cox and Sacks. 2002. *Neurology* 58: 956-959.

Week 2 Discussion (Feb 8) - Two Papers:

1) Murch et al. 2004. *Acta Neurologica Scandinavica* 110 (4): 267-269.

2) Monson et al. 2003. *Conservation Biology* 17 (3): 678-686.

Week 3 Discussion (Feb 15):

Bradley and Mash. 2009. *Amyotrophic Lateral Sclerosis* 10: 7-20.

Content to Know for Exam:

1. What is ALS-PDC, what are its symptoms and what are its likely causes?
2. What is the chronological time for the rise and fall of ALS-PDC incidence among Chamorro people.
3. Where in the world and when did the Chamorran ALS-PDC epidemic take place?
4. Using arrows and text, diagram all of the natural and anthropogenic ecological relationships between humans and the other species involved in the contraction of ALS-PDC by humans. Common names rather than scientific names for species involved are fine. Be sure to indicate benefits as well as any negative impacts received by the species in each species-species relationship portrayed.
5. What aspect(s) of human behavior or culture is likely to be responsible for the rise of ALS-PDC?
6. Who are the scientists that developed the leading theory to explain the rise of ALS-PDC? What differentiated their theory from previous theories for the rise of ALS-PDC?
7. What are the lessons for humans to take from the ALS-PDC case study?
8. How could humans modify their behavior to eradicate ALS-PDC?

II. Case Study: Lyme Disease

Week 1 Discussion (Feb 22):

Pfeiffer MB. 2018. Introduction & Chapter 1 (pp 1-24) in *Lyme: The First Epidemic of Climate Change*. Island Press: Washington.

Week 2 Discussion (Mar 1):

Allan et al. 2003. *Conservation Biology* 17: 267-272.

Week 3 Discussion (Mar 8):

Blakely C. 2018. What Makes the Heart “tick”?-the cardiovascular implications of Lyme Disease. *Canadian Journal of Cardiovascular Nursing* 28:3-10.

Content to Know for Exam:

1. What is Lyme Disease, what are its symptoms and which disease organism causes the disease once inside the body?
2. What is the chronological time for the rise of Lyme Disease in North America?
4. Using arrows and text, diagram all of the natural and anthropogenic ecological relationships between humans and the other species involved in the contraction of Lyme Disease by humans. Common names rather than scientific names for species involved are fine. Be sure to indicate benefits as well as any negative impacts received by the species in each species-species relationship portrayed. Be sure to indicate which are host, disease, and vector organisms.
5. What aspect(s) of human behavior or culture is likely to be responsible for the rise in the incidence rate of Lyme?
6. What can humans do to restore their environment to one that would decrease the incidence of Lyme?

III. Pest & Alien Species Case Studies

Week 1 Discussion on the Economic Costs (Mar 22):
Pimentel et al.. 2005.

Week 2 Discussion on the Chestnut Blight (Mar 29):
Hepting GH. 1974. Journal of Forest History 18: 60-67.

Week 3 Discussion on the Spotted Lantern Fly (Apr 5):
Dara et al. 2015. Journal of Integrated Pest Management 6(1): 20 (pp 1-6).

Week 4 Discussion on Dutch Elm Disease (Apr 12):
Marcotrigiano M. 2017. Elms revisited. Arboriculture & Urban Forestry 43(6): 217-241.

Week 5 Discussion on the American Cane Toad (*Rhinella marina*) in Australia (Apr 19):
1) Mercer P. 2017. The rapid spread of Australia's cane toad pest (<https://www.bbc.com/news/world-australia-39348313>)
2) Tingley R, R Shine. 2011. Desiccation Risk Drives the Spatial Ecology of an Invasive Anuran (*Rhinella marina*) in the Australian Semi-Desert. PLoS ONE 6(10): 1-6.

Content to Know for Exam:

1. What is an Alien species?
2. What is an invasive species?
3. What is an agricultural pest species?
4. What are the ecological and evolutionary reasons that alien species sometimes become invasive in their non-native regions?
5. What have humans done generally to cause the invasive alien and pest species problem?
6. What can humans do to prevent additional alien species problems?
7. Which author attempted to put monetary statistics on the alien species problem in the USA? Why is it important to do this?
8. For each of the specific case studies (chestnuts, lantern flies, Dutch Elm disease, and cane toads),
 - a. What is the pest species and why is it a pest?
 - b. What is the non-human specie(s) that were negatively impacted in the specific articles read. Common names are fine.

c. When did each species become a problem in the regions described in the articles we read.

IV. Algal Blooms & Their Impacts Case Studies

Week 1 Discussion on Dead Zones (Apr 26):

Altieri AH, KB Gedan. 2015. Climate change and dead zones. *Global Change Biology* 21(4): 1395-1406.

Week 2 Discussion on Harmful Algal Blooms (May 3):

Pick FR. 2016. Blooming algae: a Canadian perspective on the rise of toxic cyanobacteria. *Canadian Journal of Fisheries & Aquatic Science* 73: 1149-1158.

Content to Know for the Exam:

1. What is a Dead Zone and what causes it?
2. What is the negative effect of Dead Zones on non-human species? What is the economic impact of such on humans?
3. Diagram the abiotic and biotic factors that contribute to Dead Zone formation.
4. What is an algal bloom and what are the factors that lead to its formation?
5. What is a toxic algal bloom?
6. What is the name for the specific type of organism(s) that the article on toxic algal bloom focuses on?
7. What is a hepatotoxin? Neurotoxin? Dermatoxin?
8. What anthropogenic factors have lead to the increase in harmful algal blooms?
9. How do toxic cyanotoxins get into the human body?
10. Name rank the top 3 causes of algal blooms in order of importance.