

Controversies in Marine Science , MSL F605P

Spring 2018 1 credit

Location: Fishbowl

Time: Tuesdays 3-4pm

Instructor: Brenda Konar

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Office Hours: 4-5pm on Wednesdays... if you cant make this time, let me know and well make other arrangements

Course Description:

Goal: This course will introduce students to the idea that science is fluid and controversies and disagreements do occur. These disagreements are often published in the primary literature. The general philosophy of doing science will also be discussed.

Instructional methods: The course is a **discussion** of various controversial topics in marine science. Each week, students will read papers involving one specific controversy. Students will informally discuss/debate the various issues around the controversy. At the end of each class

- 4

Paine, RT. 1969. A note on trophic complexity and community stability. *The American Naturalist* 103:91-93.

Estes JA and JF Palmisano. 1974. Sea otters: Their role in structuring nearshore communities. *Science* 185:1058-1060.

Foster MS. 1990. Organization of macroalgal assemblages in the Northeast Pacific: the assumption of homogeneity and the illusion of generality. *Hydrobiologia* 192:2133.

Paine RT. 1991. Between Scylla and Charybdis: do some kinds of criticism merit a response? *Oikos* 62:90-92.

Foster MS. 1991. Rammed by the Exxon Valdez 9.3 (e13.15 ()06n023-12.a3.15 1.16)-12.306.4 .7 (-)-1.1 (19358P6(1

DeMaster et al. 2006. The sequential megafaunal collapse hypothesis: Testing with existing data. *Progress in Oceanography* 68:329-342.

Feb 20 **Continued from last week... (47)**

Springer et al. is a rebuttal to the comments we read last week. Wade et al. is a rebuttal to Springer et al. Finally, Estes et al. is the final published comment on the controversy.

Springer AM, JA Estes, GB vanVliet, TM Williams, DF Doak, EM Danner, KA Forney and B Pfister. 2008. Mammal-eating killer whales, industrial whaling, and the sequential megafaunal collapse in the North Pacific Ocean: a reply to critics of Springer et al 2003. *Marine Mammal Science* 24:414-442.

Wade PR, JM VerHoef and DP DeMaster. 2009. Mammal-eating killer whales and their prey-trends for pinnipeds and sea otters in the North Pacific Ocean do not support the sequential megafaunal collapse hypothesis. *Marine Mammal Science* 25:737-747.

Estes JA, DF Doak, Springer AM, TM Williams, GB vanVliet. 2009. Trend data do support the sequential nature of pinniped and sea otter declines in the North Pacific ocean, but does it really matter? *Marine Mammal Science* 25:748-754.

Feb 27 **Serendipity... what one scientist learned the hard way....**

Mar 6 **Over fishing and its causes and consequences (21)**

Yodzis is food for thought. Worm et al. was the paper that started the discussions. The rest are the controversy. The Stokstad is a truce (of sort).

Yodzis P. 2001. Must top predators be culled for the sake of fisheries? *Trends in Ecology and Evolution* 16:78-84.

Worm B, EB Barbier, N Beaumont, JE Duffy, C Folke, BS Halpern, JBC Jackson, HK Lotze, M Fiorenza, SR Palumbi, E Sala, KA Selkoe, JJ Stachowicz and R Watson. 2006. Impacts on biodiversity loss on ocean ecosystems services. *Science* 314:787-790.

Jaenike J. 2007. Comment on Impacts of biodiversity loss on ocean ecosystem services" *Science* 316:1285.

Wilberg MJ and TJ Miller. 2007. Comment on Impacts of biodiversity loss on ocean ecosystem services" *Science* 316:1285.

Longhurst A. 2007. Doubt and certainty in fishery science: Are we really headed for a global collapse of stocks? *Fisheries Research* 86:1-5.

Worm B, EB Barbier, N Beaumont, JE Duffy, C Folke, BS Halpern, JBC Jackson, HK Lotze, M Fiorenza, SR Palumbi, E Sala, KA Selkoe, JJ Stachowicz and R Watson. 2007. Response to comments on Impacts of biodiversity loss on ocean ecosystem services" *Science* 316:1285.

Stokstad E. 2009. Dénouement in the Fisheries War. *Science* 324:170- 171.

Mar 13 **Spring Break**

Mar 20 **Faith Based Fisheries (25)**

This is an interesting discussion on faith-based research..i.e., no real data. It also includes the on-going debate on the decline of large predatory species.

Hilborn R. 2006. Faith-based fisheries. *Fisheries* 31:554-555.

Myers RA and B Worm. 2003. Rapid worldwide depletion of predatory fish communities. *Nature* 423:280-283.

Walters CJ. 2003. Folly and fantasy in the analysis of spatial catch rate data. *Canadian Journal of Fisheries and Aquatic Science* 60:1433-1436.

Hampton J, JR.Sibert, P Kleiber, MN Maunder and SJ Harley. 2005. Decline of Pacific tuna populations exaggerated? *Nature* 434:E1-E2.

Polacheck T. 2006. Tuna longline catch rates in the Indian Ocean: did industrial fishing result in a 90% rapid decline in the abundance of large predatory species? *Marine Policy* 30:470-482.

Mar 27 Climate change vs. "hidden" factors such as celestial movements (15)

The Barry et al. paper was a very hot topic when it came out. It was one of the first to propose climate change impacting intertidal communities. Then came Denny and Paine and this took some of the wind out of Barry et al. How does this relate to what Sanford has shown?

Barry JP, CH Baxter, Rd Sagarin and SE Gilman. 1995. Climate-related, long-term faunal changes in a California rocky intertidal community. *Science* 267:672-675.

Denny MW and RT Paine. 1998. Celestial mechanics, sea-level changes, and intertidal ecology. *Biological Bulletin* 194:108-115.

Sanford E. 1999. Regulation of keystone predation by small changes in ocean temperature. *Science* 283:2095-2097.

Minteer BA and JP Collins. 2010. Move it or lose it? The ecological ethics of relocating species under climate change. *Ecol. Appl.* 20:1801-1804.

McLachlan JS, JJ Hellmann and MW Schwartz. 2007. A framework for debate of assisted migration in an era of climate change. *Conservation Biology* 21:297-302.

Hoegh-Guldberg O, L Hughes, S McIntyre, DB Lindenmayer, C Parmesan, HP Possingham and CD Thomas. 2008. Assisted colonization and rapid climate change. *Science* 321:345-346.

Richardson DM, et al. 2009. Multidimensional evaluation of managed relocation. *Proceedings of the National Academy of Sciences USA* 106:9721-9724.

Sax DF, KF Smith and AR Thompson. 2009. Managed relocation: a nuanced evaluation is needed. *Trends in Ecology and Evolution* 24:472-473.

Schlaepfer MA, WD Helenbrook, KB Searing and KT Shoemaker. 2009. Assisted colonization: evaluating contrasting management actions (and values) in the face of uncertainty. *Trends in Ecology and Evolution* 24:471-472.

Davidson I and C Simkanin. 2008. Skeptical of assisted colonization. *Science* 322:1048-1049.

Ricciardi A and D Simberloff. 2009. Assisted colonization is