BIOL/ENST/NORT 3313: ECOLOGICAL STRUCTURE IN NORTHERN ENVIRONMENTS

TOPIC 2: LATITUDINAL GRADIENTS IN DIVERSITY

Diversity declines with latitude

Or does it?

Is there a simple analytical explanation?

Area's signal is strong

Diversity varies with productivity

Other null models

Cradles, museums, and 'out of tropics'

Speciation and extinction

The value of diversity: the dilution effect

Relationship with latitude

Something to think about:

Contemplate the relationship between species diversity and productivity. Does this relationship emerge from productivity differences in speciation and extinction?

Required reading:

Mittelbach, G. G. et al. 2007. Evolution and the latitudinal diversity gradient: speciation, extinction and biogeography. Ecology Letters 10:315-331. http://dx.doi.org/10.1111/j.1461-0248.2007.01020.x

Weir, J. T. and D. Schluter. 2007. The latitudinal gradient in recent speciation and extinction rates of birds and mammals. Science 315:1574-1576. http://dx.doi.org/10.1126/science.1135590

Rolland, J. et al. 2014. Faster speciation and reduced extinction in the tropics contribute to the mammalian latitudinal diversity gradient. PLOS Biology 12: e1001775 http://www.plosbiology.org/article/info%3Adoi%2F10.1371%2Fjournal.pbio.1001775

Workshop 2:

What do we know about the class term research proposal?

Choose one theme that you considered during week 1 as your term project and identify how it does or does not relate to the others. Make a list of synergies. At the end of class, select one of the following terms describing your self-assessment on this task (exceptional, outstanding, very strong, strong, moderate, insufficient). Do the same for the class as a whole. Submit both 'scores' to your GA before leaving. Answer the following questions:

What do we want to know (make a list)?

What do we know (make a list)?

What do we need to know (make a list)?

Who knows what (make a list)?

How do we make this work (define leadership and teamwork)?

Some related reading:

Marshall, C. R. 2007. Explaining latitudinal diversity gradients. Science 317:451. http://dx.doi.org/10.1126/science.317.5837.451

Schluter, D. and J. Weir. 2007. Response. Science 317:451. http://dx.doi.org/10.1126/science.317.5837.451

Weir, J. T. and D. Schluter. 2008. Response to comment on "The latitudinal gradient in recent speciation and extinction rates of birds and mammals". Science 319:901d. http://dx.doi.org/10.1126/science.1150828

Tobias, J. A. et al. 2008. Comment on "The latitudinal gradient in recent speciation and extinction rates of birds and mammals". Science 319:901c. http://dx.doi.org/10.1126/science.1150568

Belmaker, J. and W. Jetz. 2015. Relative roles of ecological and energetic constraints, diversification rates and region history on global species richness gradients. Ecology Letters 18:563-571. http://onlinelibrary.wiley.com.ezproxy.lakeheadu.ca/doi/10.1111/ele.12438/epdf

Willig, M. L. and S. J. Presley. 2018. Latitudinal gradients of biodiversity: theory and empirical patterns. In: Dominick, A. D. and J. I. Goldstein (eds.) The Encyclopedia of the Anthropocene 3: 13-19. Oxford: Elsevier. https://hydrodictyon.eeb.uconn.edu/people/willig/Willig_pdf/SJ_224_Willig_&_Presley_2018.pdf