

Schedule

Ecological Genetics

ECL242/PHR242
Winter Quarter, 2009
Subject to update
Last updated: March 3, 2009



Lectures/Discussions led by Holly Ernest unless noted

Week	Date	Location	Reading	Topics
Introduction to ecological genetics CH 1&2				
1	Tue 1/6/09	2030 Valley Hall Vet Med Complex	Ch 1	LEC: Course mechanics; Intro to Ecol. Gen. LEC: History of Ecol Gen
	Thu 1/8/09	2030 Val	Ch 2 HW1 due	LEC: Mandi Finger-Molec. Biology for Ecology LEC: Molecular Biology for Ecology
Molecular Identification and Behavioral ecology for genetics studies CH 3&4				
2	Tue 1/13/09	2030 Val	Ch 3 HW2 due	LEC/DISC 5 & 6: Molecular ID of species, individuals, and sex
	Thu 1/15/09	2030 Val	Ch 4 Fowler 2009	LEC: Behavioral Ecology; Kinship DISC : Planning Ecol. Gen Project
Population genetics and Intro to computational pop gen CH 5 (first half)				
3	Tue 1/20/09	2030 Val	Ch 5	LEC: Population Genetics LEC: Guest Lecturer: Jason Sexton: Pop gen in Sierra endangered plant
	Thu 1/22/09	2020 Science Lab Bldg		Computer lab: Getting data ready for analysis: Microsat Toolkit, GENEPOP
Population genetics and Intro to the DNA LAB Ch 5 (first half)				
4	Tue 1/27/09	2030 Val	Ch 5 through page 154 HW3 due 1/26	LEC: Review session for material to date; DISC: Mid-quarter course eval by Teaching Res.Cntr
	Thu 1/29/09	Dr. Ernest's DNA lab 273/277 Vet Med 2		DNA Lab: Intro to the Ecological Genetics Lisa Goldberg, Wildlife Genetics Lab manager
Population genetics (rest of CH 5), Molecular variation & adaptation CH 6				
5	Tue 2/3/09	2030 Val	EXAM Ch 5 (154-end)	Exam-one hour (up through 1/29/2008) LEC: Pop Gen (continued)
	Thu 2/5/09	2030 Val	Travers et al 2007 + 2 optional papers Ch 6	LEC: Guest Lecturer: Dr. Josh Israel ecological genomics: Sturgeon/Trout Fish LEC: Molecular & Adaptive Variation
Phylogeography & Landscape Genetics CH 7				
6	Tue 2/10/09	2030 Val	Ch 7	LEC: Phylogeography & Landscape Gen DISC : Molecular Markers
	Thu 2/12/09	2020 SLB	Bonin et al 2004	Computer lab Collecting and assessing genotype data from the lab; STRand program
State of the Art Genomic tools; Stat analysis, interpretation of data, software				
7	Tue 2/17/09	GENOME CENTER Room 5202	Morin 2004 Start reading Ch 8, 9 & 10 for future sessions	GENOME CENTER Tour and talk by Dr. Charlie Nicolet –Tools & Resources for Genomics
	Thu 2/19/09	2020 SLB		Computer lab: Pop genetics data analysis and software; Mandi Finger & Holly Ernest



Conservation Genetics CH 8; Stat analysis, interpretation of data, software				
8	Tue 2/24/09	2030 Val	Ch 8; Dudgeon 2009 ; Re-scan Fowler duck paper HW4 DUE	LEC: Conservation Genetics DISC : Field aspects of sampling; permits
	Thu 2/26/09	2020 SLB	Continue Ch8 Hull 2008	Computer lab: Guest lab leader: Dr. Josh Hull Pop. Structure: Raptor case examples
Gene Expression, Microbial ecological genetics CH 9; GMO's CH 10				
9	Tue 3/3/09	2030 Val	Kammenga2007 Optional paper Ch 9 & 10-scan	LEC : Guest Lecturer: Dr. Melinda Baerwald gene expression (qRT-PCR and microarrays) Online LEC : Microbial ecological genetics
	Thu 3/5/09	2020 SLB	Click around GENEBANK	Computer lab: Sequence data analysis: Lisa Goldberg, Mandi Finger, Holly Ernest
Student term project presentations				
10	Tue 3/10/09	2030 Val	Optional articles from student presenters	Student term project presentations
	Thu 3/12/09	2030 Val	Optional articles from student presenters	Student term project presentations

Course Schedule subject to adjustments – check Course SmartSite for updates

2030 Val = 2030 Valley Hall Vet Med Complex Lec=lecture Disc=discussion

Readings as in Beebe and Rowe Introduction to Molecular Ecology 2008 2nd edition text

Articles = journal papers pertinent to class topics – to be assigned

DETAILS ON READING ASSIGNMENTS

Paper for Jan 15 and succeeding sessions:

Ada C. Fowler, John M. Eadie and Andrew Engilis Jr. 2009 Identification of endangered Hawaiian ducks (*Anas wyvilliana*), introduced North American mallards (*A. platyrhynchos*) and their hybrids using multilocus genotypes. Conservation Genetics. Online early

<https://commerce.metapress.com/content/l2q23281kw12274p/resource-secured/?target=fulltext.html&sid=y1fxcv45kxluc055pq3hlz55&sh=www.springerlink.com>

DOI10.1007/s10592-008-9778-8

Papers for Feb 5, 2009:

Assigned reading: Travers et al 2007.

Steven E. Travers, Melinda D. Smith, Jianfa Bai, Scot H. Hulbert, Jan E. Leach, Patrick S. Schnable, Alan K. Knapp, George A. Milliken, Philip A. Fay, Amgad Saleh, Karen A. Garrett (2007) Ecological genomics: making the leap from model systems in the lab to native populations in the field. *Frontiers in Ecology and the Environment*: Vol. 5, No. 1, pp. 19-24. doi: 10.1890/1540-9295(2007)5[19:EGMTLF]2.0.CO;2

[http://www.esajournals.org/doi/full/10.1890/1540-9295\(2007\)5%5B19:EGMTLF%5D2.0.CO%3B2?cookieSet=1](http://www.esajournals.org/doi/full/10.1890/1540-9295(2007)5%5B19:EGMTLF%5D2.0.CO%3B2?cookieSet=1)

2 optional papers for Feb 5, 2009:

1. Interaction of Rearing Environment and Reproductive Tactic on Gene Expression Profiles in Atlantic Salmon. N. AUBIN-HORTH, B. H. LETCHER, AND H. A. HOFMANN. *Journal of Heredity* 2005:96(2):1–18.

doi:10.1093/jhered/esi030.

Abstract: <http://jhered.oxfordjournals.org/cgi/content/abstract/esi030v1>

PDF file <http://jhered.oxfordjournals.org/cgi/reprint/esi030v1>

2. Variation in freshwater growth and development among five New England Atlantic salmon (*Salmo salar*) populations reared in a common environment. Mariska Obedzinski and Benjamin H. Letcher. *Can. J. Fish. Aquat. Sci.* **61**: 2314–2328 (2004) doi: 10.1139/F05-005

PDF: <http://article.pubs.nrc-cnrc.gc.ca/RPAS/rpv?hm=HInit&afpf=f05-005.pdf&journal=cjfas&volume=61>

Reading assignment for Feb 12, 2009

Bonin et al 2004:

BONIN, E. BELLEMAIN, P. BRONKEN EIDASEN, F. POMPANON, C. BROCHMANN, P. TABERLET (2004)

How to track and assess genotyping errors in population genetics studies. *Molecular Ecology* 13 (11), 3261–3273. doi:10.1111/j.1365-294X.2004.02346.x

<http://www3.interscience.wiley.com/cgi-bin/fulltext/118794802/HTMLSTART>

Reading assignment for Feb 17, 2009 for :

Morin et al 2004.

SNPs in ecology, evolution and conservation

Trends in Ecology & Evolution

Volume 19, Issue 4, April 2004, Pages 208-216

<http://dx.doi.org/doi:10.1016/j.tree.2004.01.009>

doi:10.1016/j.tree.2004.01.009

Long link:

[http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6VJ1-4BJWXKD-](http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6VJ1-4BJWXKD-1&_user=4421&_rdoc=1&_fmt=&_orig=search&_sort=d&_view=c&_acct=C000059598&_version=1&_urlVersion=0&_userid=4421&_md5=469bf95bc9cc3751f6d42e1b6ac0c288)

[1&_user=4421&_rdoc=1&_fmt=&_orig=search&_sort=d&_view=c&_acct=C000059598&_version=1&_urlVersion=0&_userid=4421&_md5=469bf95bc9cc3751f6d42e1b6ac0c288](http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6VJ1-4BJWXKD-1&_user=4421&_rdoc=1&_fmt=&_orig=search&_sort=d&_view=c&_acct=C000059598&_version=1&_urlVersion=0&_userid=4421&_md5=469bf95bc9cc3751f6d42e1b6ac0c288)

Feb 26, 2009 Hull et al.

<http://www.springerlink.com/content/dt1248580w8p1152/>

Joshua M. Hull, Richard Anderson, Michael Bradbury, James A. Estep, Holly B. Ernest. 2008. Population structure and genetic diversity in Swainson's Hawks (*Buteo swainsoni*): implications for conservation.

Conservation Genetics, 9(2):305-316

Reading assignment for March 3, 2009 for Dr. Melinda Baerwald's talk on microarrays:

Kammenga et al 2007

Microarray challenges in ecology

Trends in Ecology & Evolution

Volume 22, Issue 5, May 2007, Pages 273-279

<http://dx.doi.org/doi:10.1016/j.tree.2007.01.013>

Optional reading provided by Melinda:

S Dupont, K Wilson, M Obst, H Sköld, H Nakano, et al. 2007. Marine ecological genomics: when genomics meets marine ecology. *Marine Ecology Progress Series*. Vol. 332: 247–248,

http://www.int-res.com/articles/theme/m332_TS.pdf#page=11
