

ConGen Data Analysis Course Program

Montana 11-16 September, 2007

Track 1	Lecture title
Track 2	Type of lecture
Track 3	Software explanation and use hands on
Track 4	Recommended readings Copies (pdf's) available on course web site for participants
Track 5	Subject

TUESDAY, September 11, 2007

14:00 pm - 9:00 pm	Registration (& computer set up for your lap top in Elrod Lecture Hall)
6:45 pm - 7:30 pm	Barbeque and drinks at kitchen & deck overlooking the lake
6:30 pm - 9:00 pm	Social time and drinks at kitchen & deck overlooking the lake

WEDNESDAY, September 12, 2007

7:00 am - 7:45 am	Breakfast		
8:00 am - 8:15 am	Welcome address (Elrod Lecture Hall): Megan McPhee, Univ. of Montana Biostation, and Gordon Luikart, Univ. of Porto & CIBIO, Portugal, and Univ. of Montana		
8:15 am - 8:45 am	6 or 8 student introductions & presentations (2-4 minutes each, 3-4 power point slides)		
8:45 am - 11:00 am	Introduction to conservation genetics, molecular markers, and data analysis		
8:45 am - 9:30 am	Keynote address: Robin Waples, US National Marine Fisheries Service, Seattle WA		
	The expanding role of genetics in conservation	Concepts / Background	Chapter 1 from Allendorf & Luikart 2007
9:30 am - 10:00 am	Keynote address: Albano Beja-Pereira, Univ. of Porto and CIBIO, Portugal		
	Molecular marker types & characteristics	Concepts / Background	Schlotterer 2004, Morin <i>et al.</i> 2004
10:00 am - 11:00 am	Keynote address: Oscar Gaggiotti, University of Grenoble I, France		
	Frequentist, likelihood, & Bayesian approaches; the coalescent	Concepts / Background	Appendix 1 from Allendorf and Luikart 2007, Beaumont and Rannala 2004, Rosenberg and Nordborg 2002
11:00 am - 11:30 am	Coffee/snack break (back of Elrod lecture hall)		
11:30 pm - 12:30 pm	Data quality control, non-invasive DNA sampling, and population abundance estimation		
11:30 pm - 12:30 pm	Keynote address: Mike Schwartz, US Forest Service in Missoula, USA		
	Background concepts & overview	Concepts / Background	McKelvey and Schwartz 2004
	Consensus genotype identification, genotyping errors, individual identification	Hands on	Drop-out McKelvey and Schwartz 2005
12:30 pm - 1:15 pm	Lunch		
1:30 pm - 2:30 pm	Introduction to population abundance estimation with non-invasive samples	Hands on	Drop-out McKelvey & Schwartz 2005
2:30 pm - 3:30 pm	Effective population size estimation and bottleneck detection		

	Keynote Address: David Tallmon, University of Alaska at Juneau, USA		
2:30 pm - 3:30 pm	N_e estimation and bottleneck detection: Background & overview	Concepts / Background	Waples 1991 Tallmon et al. 2004
	N_e estimation and Approximate Bayesian Methods	Concepts / Hands on	OneSamp, Tallmon et al. in press LDNe, Waple's program (Waples 2006)
3:30 pm - 4:00 pm	Coffee/snack break		
4:00 pm - 4:45 pm	Bottleneck detection		
	Keynote Address: Gordon Luikart		
4:00 pm - 4:45 pm	Bottleneck: Background concepts & overview	Concepts / Background	Luikart and Cornuet 1998
	Bottleneck tests	Hands on	Bottleneck Piry et al. 1999
4:45 pm - 5:45 pm	15 Student introductions & presentations (3-4 minutes each, 3-4 power point slides)		
6:00 pm - 6:45 pm	Dinner		
7:00 pm - 9:30 pm	Hands on data analysis & discussion with Gaggiotti, Luikart, Schwartz, Tallmon, & Waples. Students are invited to bring questions on their data, software, and statistical analyses. Students should have their data set formatted for software programs before arriving.		

THURSDAY, September 13, 2006

7:00 am - 7:45 am	Breakfast		
7:50 am - 10:30 am	Population structure, evolutionary significant units, and management units		
7:50 am - 8:30 am	Keynote Address: Robin Waples, US National Marine Fisheries Service, Seattle		
7:50 am - 8:30 am	"What is a population?"	Concepts / Background	Waples and Gaggiotti 2006
	Keynote Address: Jonathan Pritchard, University of Chicago		
8:30 am - 10:30 am	Background concepts & overview	Concepts / Background	Pritchard et al. 2000
	Substructure detection, hybrid identification	Theoretical & Hands on	Structure 1 & 2 (& 3?) Pritchard & Wen, STRUCTURE User's Manual
10:30 am - 11:00 am	Coffee/snack break		
	Phylogeography, landscape genetics and spatially explicit approaches		
	Keynote address: Mark Miller, Utah State University, USA		
11:00 am - 12:30 pm	Phylogeography, landscape genetics and spatially explicit approaches	Concepts / Background	Miller et al. 2006, Mol Ecol Manel et al. 2003, TREE
	Spatially explicit approaches	Hands on	Alleles in space Miller 2005, AIS Manuel
12:30 pm - 1:15 pm	Lunch		
1:30 pm - 2:30 pm	Mark Miller continued: Landscape genetics and spatially explicit approaches	Hands on	Alleles in space, PCA Alleles in space (AIS)
2:30 pm - 5:00 pm	Migration rate estimation via direct (assignment test) & indirect (Fst, Baysass+) approaches		

	Keynote address: Bruce Rannala, University of California, Davis			
2:30 pm - 3:30 pm	Non-equilibrium approaches to estimate migration rates (Nm)	Concepts / Background	Slatkin 1987, Science Wilson and Rannala 2003, Genetics Paetkau et al. 2003, Molecular Ecology	
	estimating Nm	Hands on	BayesAss;	Wilson and Rannala 2003, Genetics Piry et al. 2004, Mol. Ecol. Notes
3:30 pm - 4:00 pm	Coffee/snack break			
4:00 pm - 5:00 pm	Estimating Nm (direct and indirect methods)	Hands on	Indirect Nm estimation BayesAss	Wilson and Rannala 2003, Genetics
5:00 pm - 5:45 pm	Remaining 5-10 Student introductions & presentations (3-4 minutes each)			
6:00 pm - 6:45 pm	Dinner			
7:30 pm - 9:30 pm	Hands on data analysis by Pritchard, Miller, Rannala, & Waples Students are invited to introduce questions on their data, software, and statistical analyses			

FRIDAY, September 14, 2006

7:00 am - 7:45 am	Breakfast			
	Identification of landscape features influencing gene flow using Individual based causal modeling			
8:00 am - 10:30 am	Keynote address: Sam Cushman, US Forest Service, Missoula, MT			
	Individual based causal modeling	Concepts / Background	Storfer et al. 2007, Heredity Cushman et al. 2006, Am. Nat.	
	Partial Mantel tests and causal modeling	Hands on	GenAEx, R	
10:30 am - 11:00 am	Coffee/snack break			
11:00 am - 12:30 pm	Combining genetic and demographic information to infer dispersal or colonization			
11:00 am - 12:30 pm	Keynote address: Oscar Gaggiotti			
	Background concepts & overview	Concepts / Background	Gaggiotti et al. 2002, Nature Foll and Gaggiotti 2006, Genetics	
		Hands on	GESTE	Foll and Gaggiotti 2006, Genetics and helpGESTE1.rtf
12:30 pm - 1:00 pm	Lunch			
1:15 pm - 2:00 pm	Oscar Gaggiotti, <i>continued</i> Hands on			
2:00 pm - 3:30 pm	Bioinformatics & detecting molecular adaptation			
	Keynote address: David Lynn, Simon Fraser University, Vancouver, B.C., Canada			
	Detecting Adaptive Evolution Between Species and Populations; Bioinformatics; Fst-outlier detection	Concepts / Background	Lynn et al. 2005, Genetics	
	Detecting Positive Selection - An introduction to PAML program	Hands on	PAML	Lynn et al., In press
3:30 pm - 4:00 pm	Coffee/snack break			

4:00 pm - 4:30 pm	David Lynn, <i>continued</i> Hands on		
4:30 pm - 5:30 pm	DNA based studies to estimate population size and more: lessons from the NCDE (Northern Continental Divide Ecosystem) grizzly bear study		
4:30 pm - 5:30 pm	Keynote Address: Kate Kendall, US Geological Survey		
	Sample quality, data quality, and field studies	Concepts / Background	See: http://www.nrmssc.usgs.gov/research/NCDEbeardna.htm
6:00 pm - 6:45 pm	Dinner		
7:00 pm - 7:30 pm	Final discussion with all instructors as a panel: Take home messages?; Future needs and directions for conservation genetic data analysis?		
7:30 pm - 9:30 pm	Open session on data analysis with Cushman, Lynn, Cushman, Kendall (& all invited speakers) Students are invited to introduce questions, software, and statistical analyses		

SATURDAY, September 15, 2006

8:00 am - 8:45 am	Breakfast (& pack your own sack lunch)		
9:00 am - 4:00 pm	Meet at <u>8:50am sharp</u> at parking area for Field trip and hike in Glacier National Park to search for bear sign, meet with grizzly bear researchers (e.g., Jeff Stetz), and perhaps hear elk bugle. Glacier is 1-2 hours van ride each direction. Some participants leave early (e.g. evening flights).		
6:00 pm - 6:45 pm	Dinner		

SUNDAY, September 16, 2006

8:00 am - 8:45 am	Breakfast		
M o r n i n g	All depart		