Course introduction

Course goals

- Understand the power and challenges associated with using low-coverage whole genome sequencing data for population genomic analysis

- Become familiar with all steps involved from sample to inference

- Develop an intuition for the statistical framework implemented in ANGSD and associated programs

- Gain experience with building a bioinformatic pipeline to process low-coverage sequencing data to perform different types of population genomic analyses

Who are we

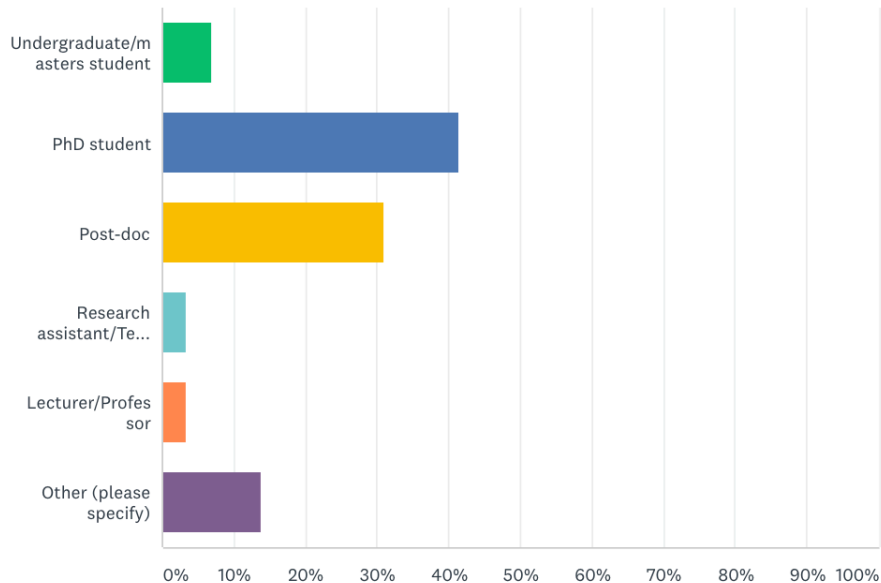# Who are you?

Who are you?

- Summary of pre-course survey

From the pre-course survey

Q1

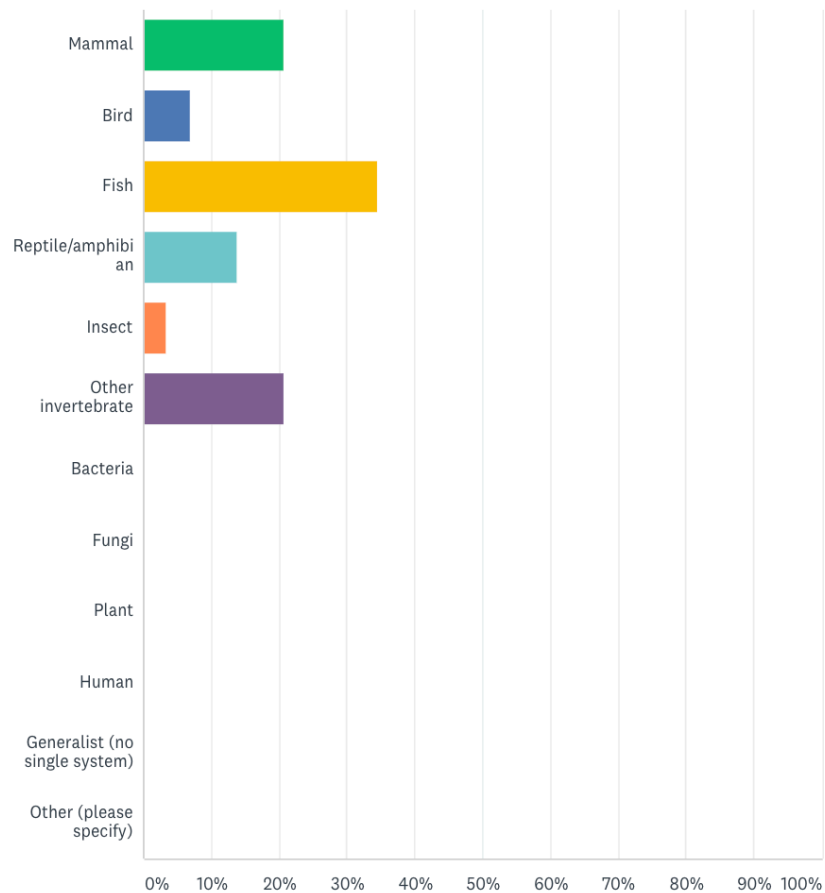Your current position

Answered: 29   Skipped: 0

Your study organism

Answered: 29   Skipped: 0

Which of the following data types do you work with

	HAVE ALREADY USED FOR ANALYSIS	HAVE AVAILABLE, BUT HAVE NOT YET WORKED WITH	PLAN TO GET, BUT DON'T HAVE YET	DON'T PLAN TO ACQUIRE	TOTAL	WEIGHTED AVERAGE
Medium-high coverage whole genome sequence data (>5x)	15.38% 4	11.54% 3	42.31% 11	30.77% 8	26	2.88
Low-coverage whole genome sequence data (<5x)	24.14% 7	17.24% 5	51.72% 15	6.90% 2	29	2.41
Target capture sequence data	16.67% 4	0.00% 0	29.17% 7	54.17% 13	24	3.21
Reduced-representation sequence data (RAD-seq, GBS, etc)	54.17% 13	8.33% 2	12.50% 3	25.00% 6	24	2.08
Microsatellite data	65.22% 15	0.00% 0	4.35% 1	30.43% 7	23	2.00
RNAseq	43.48% 10	0.00% 0	13.04% 3	43.48% 10	23	2.57
Other	37.50% 3	0.00% 0	0.00% 0	62.50% 5	8	2.88

Approximate daily schedule

Berlin time	US eastern	Activity
14 – 15.15	8 - 9.15	Session 1
		BREAK
15.30 – 16.45	9.30 -10.45	Session 2
		BREAK
17.15 – 18.30	11.15 - 12.30	Session 3
		BREAK
18.45 - 20	12.45 - 2	Session 4

Course schedule

- Day 1
  - Welcome!
  - Introduction to low-coverage whole genome sequencing
  - From sample to fastq
  - From fastq to bam

- Day 2
  - Genotype likelihoods
  - SNP calling
  - Allele calling

Course schedule

- Day 3
  - Linkage disequilibrium
  - Population structure (PCA and admixture analysis)

- Day 4
  - The site frequency spectrum (1d and 2d)
  - Fst and diversity statistics
  - Overview of other applications and future perspective