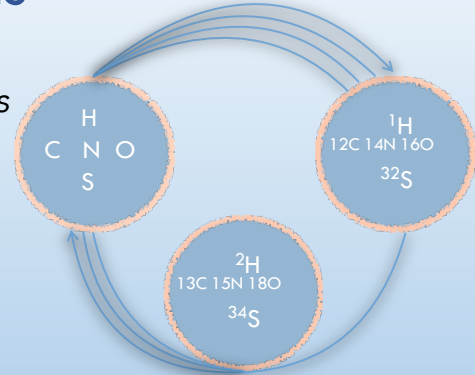


MIXSIAR: AVIAN DIET RECONSTRUCTION USING STABLE ISOTOPE MIXING MODELS

Symposium: Great R packages for Ornithologists
AOS & SCO-SOC 2021



Dr. Elena West

 @outwiththebirds
 rhworesearch.org

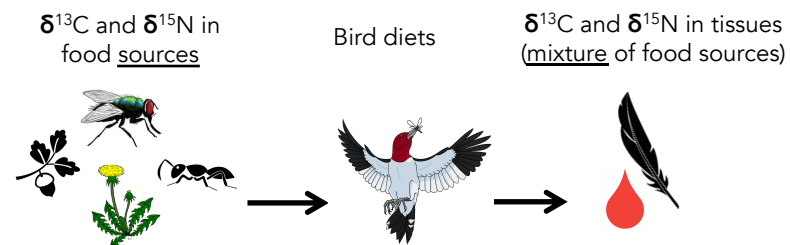


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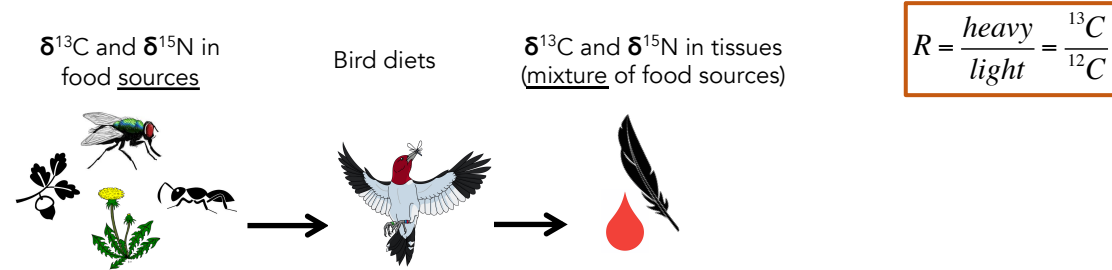
1

We are what we eat, isotopically



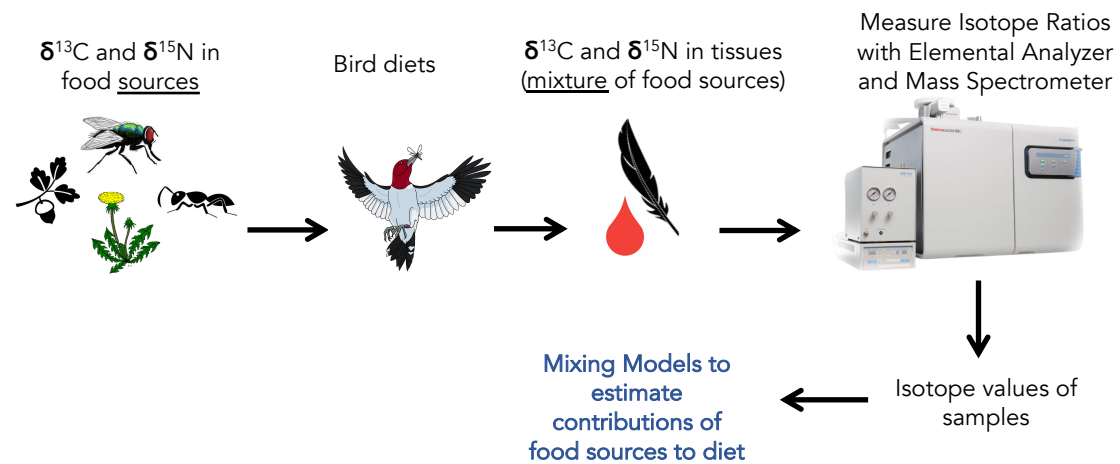
2

We are what we eat, isotopically



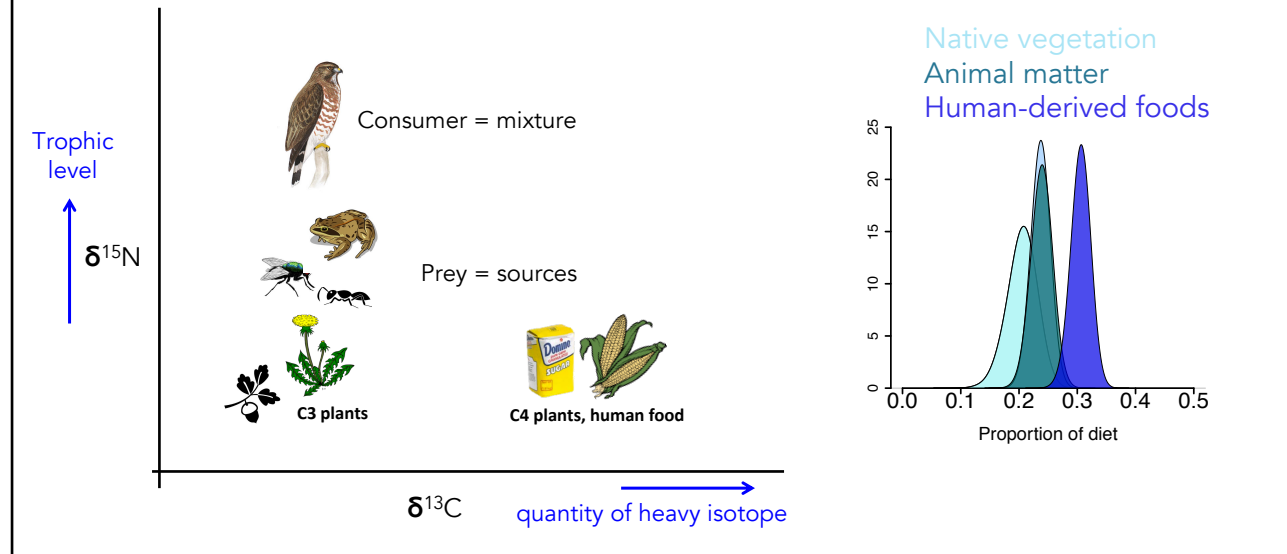
3

We are what we eat, isotopically



4

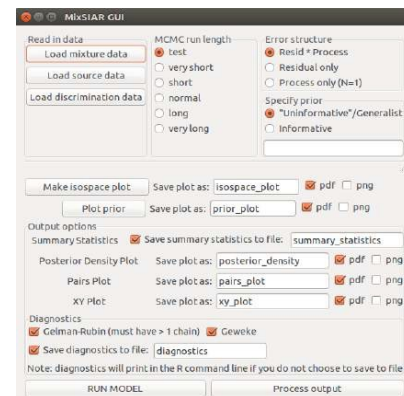
Isotope Mixing Models



5

MixSIAR

❖ Open source, GUI or script



6

MixSIAR: a modeling framework

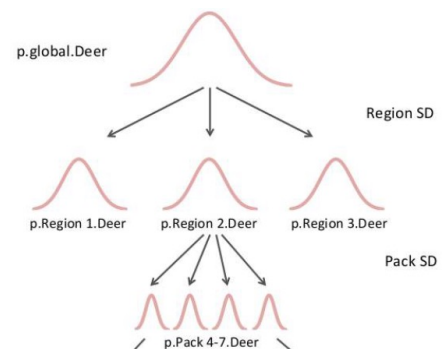
- ❖ Open source, GUI or script
- ❖ Many different models and options

MixSIAR: Brice Semmens, Brian Stock, Eric Ward, Andrew Parnell, Donald Phillips, Andrew Jackson, Stuart Bearhop, and Richard Inger

7

MixSIAR: a modeling framework

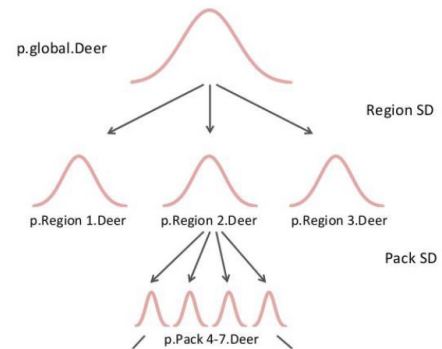
- ❖ Open source, GUI or script
- ❖ Many different models and options
 - ❖ Source data by categorical covariate (e.g. sources by region)



8

MixSIAR: a modeling framework

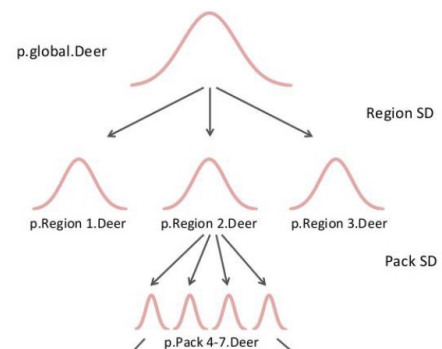
- ❖ Open source, GUI or script
- ❖ Many different models and options
 - ❖ Source data by categorical covariate (e.g. sources by region)
 - ❖ Mixture data by categorical covariate (up to 2, random or fixed effects, nested or independent)



9

MixSIAR: a modeling framework

- ❖ Open source, GUI or script
- ❖ Many different models and options
 - ❖ Source data by categorical covariate (e.g. sources by region)
 - ❖ Mixture data by categorical covariate (up to 2, random or fixed effects, nested or independent)
 - ❖ Fit multiple models and compare relative support using LOO/WAIC weights



10

MixSIAR: <https://github.com/brianstock/MixSIAR>

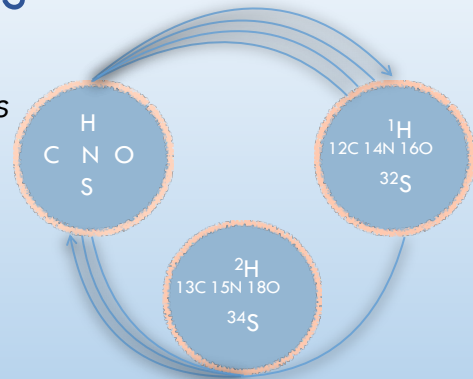
	Tracers	Random effects	Fixed effects	Continuous effect	Source data	Error structure	Informative prior	Additional features
Wolves	2 isotopes	Region, Pack (nested)	—	—	Means/SD/n (by Region)	Resid * Process	—	—
Geese	2 isotopes	—	Group	—	Means/SD/n	Resid	—	Concentration dependence
Lake	2 isotopes	—	—	Secchi: Mixed	Raw	Resid	—	—
Palmyra	2 isotopes	—	Taxa	—	Raw	Resid * Process	—	—
Killer whale	2 isotopes	—	—	—	Means/SD/n	Resid * Process	—	—
Storm-petrel	2 isotopes	—	—	—	Raw Raw	Resid	Fecal contents	—
Snail	1 isotope	—	Region	—	Means/SD/n	Resid * Process	—	—
Isopod	8 fatty acids	—	—	—	Means/SD/n	Resid * Process	—	—
Cladocera	22 fatty acids	—	Site	—	—	Process	—	—
Mantis	2 isotopes	—	Habitat	—	Means/SD/n	Resid * Process	Expert opinion, Prey abundance	Combine sources <i>a posteriori</i>
Alligator	2 isotopes	—	Sex, Size class	Length	Means/SD/n	Resid * Process	—	Compare models with LOO/WAIC

Table 1: Working examples included with MixSIAR.

11

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12