Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Impacts of climate warming on terrestrial ectotherms across latitude (Deutsch et al., 2008)

Focus questions

1. Which latitudinal region (Polar, Continental, Temperate, Dry, Tropical – See <https://scijinks.gov/climate-zones/> for additional definition, if needed) experiences the greatest magnitude of temperature variation?

Polar

1. Which latitudinal region contains species that are at the greatest risk of population decline or extinction due to climate warming?

Tropical

1. Why are ectotherms more likely to be vulnerable to climate warming than endotherms?

* They do not have internal mechanisms for thermoregulation.
* Most species are TSD so their populations will end up as all male or all female (See Jensen et al., 2018 on green sea turtles in Australia.)
* Most species exist along the equatorial region and that is predicted to have the greatest loss of species diversity (Roll et al., 2017).

1. How is ‘warming tolerance’ defined? What variables are used to calculate the ‘warming tolerance’ of a species?

WT = CTmax - Thab

CTmax – critical thermal maximum temperature of a given species

Thab - mean annual surface air temperature

1. How is ‘thermal safety margin’ defined? What variables are used to calculate the ‘thermal safety margin’ of a species?

TSM = Topt - Thab

Topt – optimum temperature of a given species

Thab – mean annual surface air temperature

1. What are four ways animals may mitigate the negative effects of climate warming? How do they differ from one another?

Acclimation – an individual’s physiological response to environmental change

Adaptation – a population’s shift in genotypic and phenotypic frequencies in response to environmental change

Dispersal – movement of individuals from one locality to another (can refer to diffusion, jump dispersal or secular dispersal)

Behavioral plasticity – an individual’s behavioral modification to shift daily activities to a more optimal period of the day.