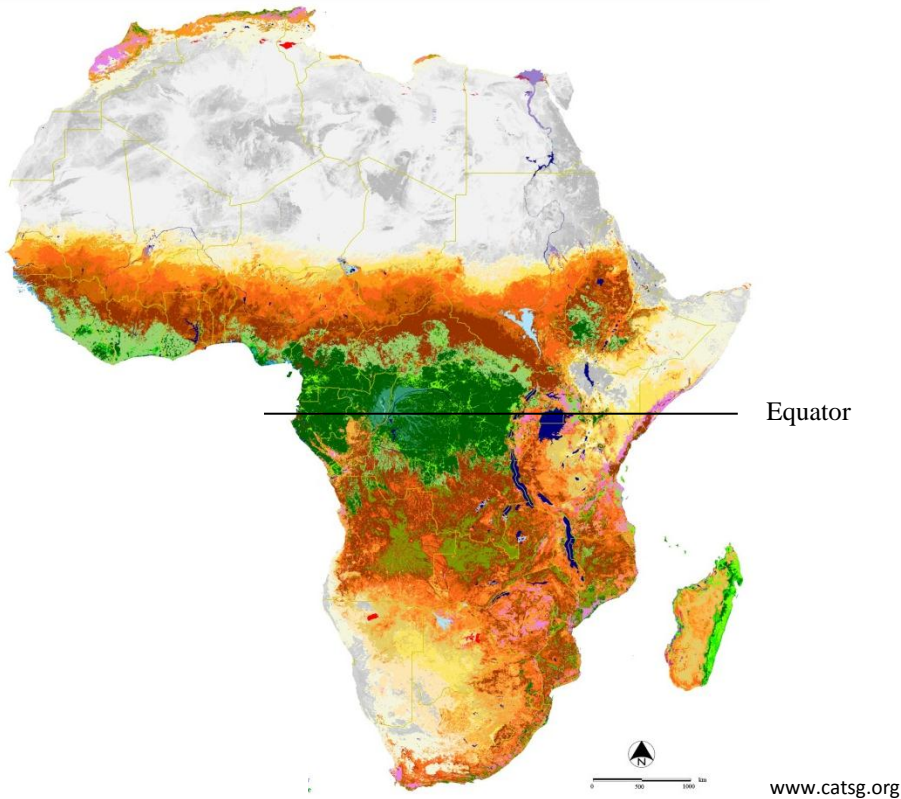


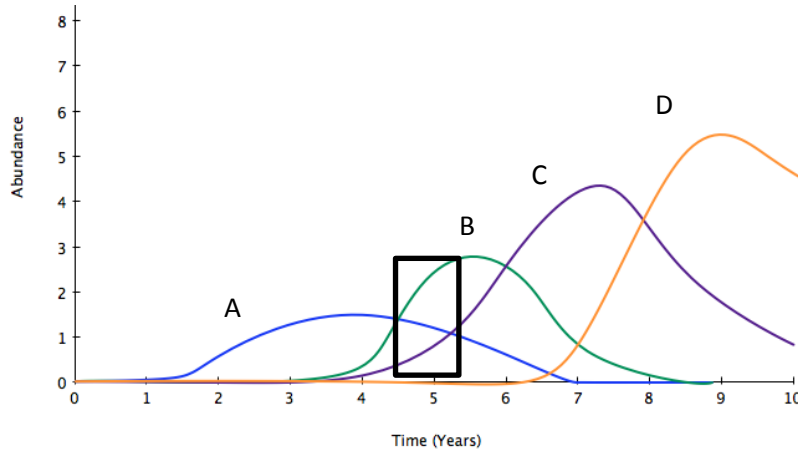
Practice Questions

The Land Cover of Africa for the year 2000

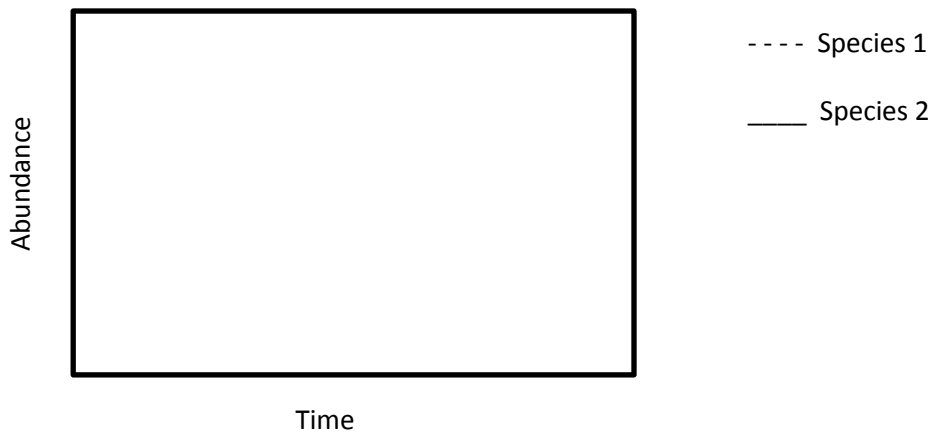


1. The figure above shows the pattern vegetation coverage in Africa. Why is the forested band (green) close to the equator? Why are the deserts (white/grey) north and south of the equator? Base your answer on climate considerations.
2. *Acacia depreanlobium* trees have long thorns to help defend it against browsing by herbivores.
 - a. Is this a constitutive or induced defense? Why?
 - b. If *A. depreanlobium* is browsed, in the next growing season its thorns become longer (Young 1987). Would this be a constitutive or induced defense? Why?
3. Four ant species (*C. mimosa*, *C. sjostedti*, *C. nigriceps*, and *T. penzigi*) are known to inhabit whistling thorn acacia trees and compete with each other. The tree provides the ants with resources such as food and housing, and the ants defend the tree against herbivores. The following abundance data was recorded: 52% of trees are inhabited by *C. mimosa*, 16% by *C. sjostedti*, 15% by *C. nigriceps* and 17% by *T. penzigi* (inspired by Palmer *et al.* 2008).
 - a. Based on resource use, how is it possible for the 4 ant species to coexist if they all require the whistling thorn acacia to survive? Suggest two ways this might be achieved.

- b. Would you predict these ant species to have complete, partial or no niche overlap? Why?
- c. Why might one of the species (*C. mimosae*) inhabit a disproportionately large number of trees? Suggest two behavioural and/or reproductive characteristics that might be involved.



4. On the graph above, each coloured curve represents a different plant species. What are at least two characteristics you would expect the following species to have:
 - a. A
 - b. D
5. What successional models are occurring between the following species during the time indicated by the black box? (One word answer)
 - a. A and B
 - b. A and C
 - c. B and C
6. Draw a graph of what tolerance succession might look like, where species 1 is tolerating species 2.



7. A species of green crab, normally found only in Europe, has recently been found near Prince Edward Island, Canada. The crab seems to be doing just fine in Canada's abiotic conditions. Would you expect this crab to be successful on Canada's East coast? Why or why not?

Palmer, T. M., Stanton, M. L., Young, T. P., Goheen, J. R., Pringle, R. M. and Karban, R. 2008. Breakdown of ant-plant mutualism follows the loss of large herbivores from an African savanna. *Science*. **319**: 192-195.

Young, T. P. 1987. Increased thorn length in *Acacia depreanobium* – a response to browsing. *Oecologia*. **71**: 436-438.