DISPERsal of MANgroves in the u.s.

by Jake Bodart
Goals

- Motivation for studying
- Brief summary of Mangroves
- Literature findings on dispersal
- Population Ecology principles of mangrove dispersal
- Conclusion of literature and future studies
Mangrove habitats provide buffering against storms/hurricanes.

Prevents soil erosion and builds land/islands.

Provide vital habitat for marine and terrestrial organisms.

- Ex. 75-90% of marine fauna with commercial and recreational purposes in Puerto Rico depend on mangroves at some phase of their life (noaa.gov).

Mangrove habitats spread through dispersal.
Types of Mangroves

- 3 types
  - *Rhizophora mangle* (Red mangroves)
  - *Avicennia germinans* (Black Mangroves)
  - *Laguncularia racemosa* (White mangroves)
- Convergent evolution *(Shi et al. 2004)*
  - Salt secretion
  - Vivipary
Mangroves can live in a range from freshwater to saltwater.

High stress environment due to salinity and flooding

Temperature limited – can’t withstand many freeze thaw cycles

Red mangrove – typically dominant in monospecific stands along shorelines and creek banks with frequent inundation (McKee 1995)

Black mangrove – dominant in interior sites, tidal inundation is less frequent (McKee 1995)

White mangrove- extensive stands at highest reaches of the tide (flooding and salinity are minimized) (McKee 1995)
Red (Rhizophora mangle), Black (Avicennia germinans), are viviparous

White mangroves (Laguncularia racemosa) are precocious germination (Tomlinson 1986)

Once mature propagules fall from the mother tree and disperse through water.

- Red: 40 days dispersal then 15 days for roots to grow
- Black: At least 14 days dispersal then 7 days for roots
- White: 8 days dispersal 5 days for roots (Rabinowitz 1978)
Dispersal Threats

- Propagule predation (minimum)
- Man made structures
  - Dykes
  - Impoundments
- Destruction of mangrove forests
  - Coastal development
Population Ecology Principles

- Propagules are pioneers (Tomlinson 1986)
- Model of Island biogeography
  - Dispersal rate
  - Distance dispersed and size of colony
- Propagules are R selected in finding habitat (Tomlinson 1986)
  - Fast growth and establishment
- Mangrove trees themselves are k-selected in maintaining their habitats (Tomlinson 1986)
- “Mangroves have their cake and eat it!” (Tomlinson 1986)
Mangrove habitats are important to aquatic and terrestrial organisms as well as important to our wallets.

- Fish industry

Mangrove habitats expand and maintain their habitats through dispersal

As climate change happens mangroves can disperse further north -> increase in habitat
References


