What controls the distribution of coral reefs?

Coral reef distribution and diversity depends on

1. TEMPERATURE (18°C - 30°C)
2. LIGHT (~150 meters, 4% of surface light)
3. SALINITY (~ 35 ppt)
4. SEDIMENTATION (low!)
5. NUTRIENT LEVELS (prefer nutrient deserts)

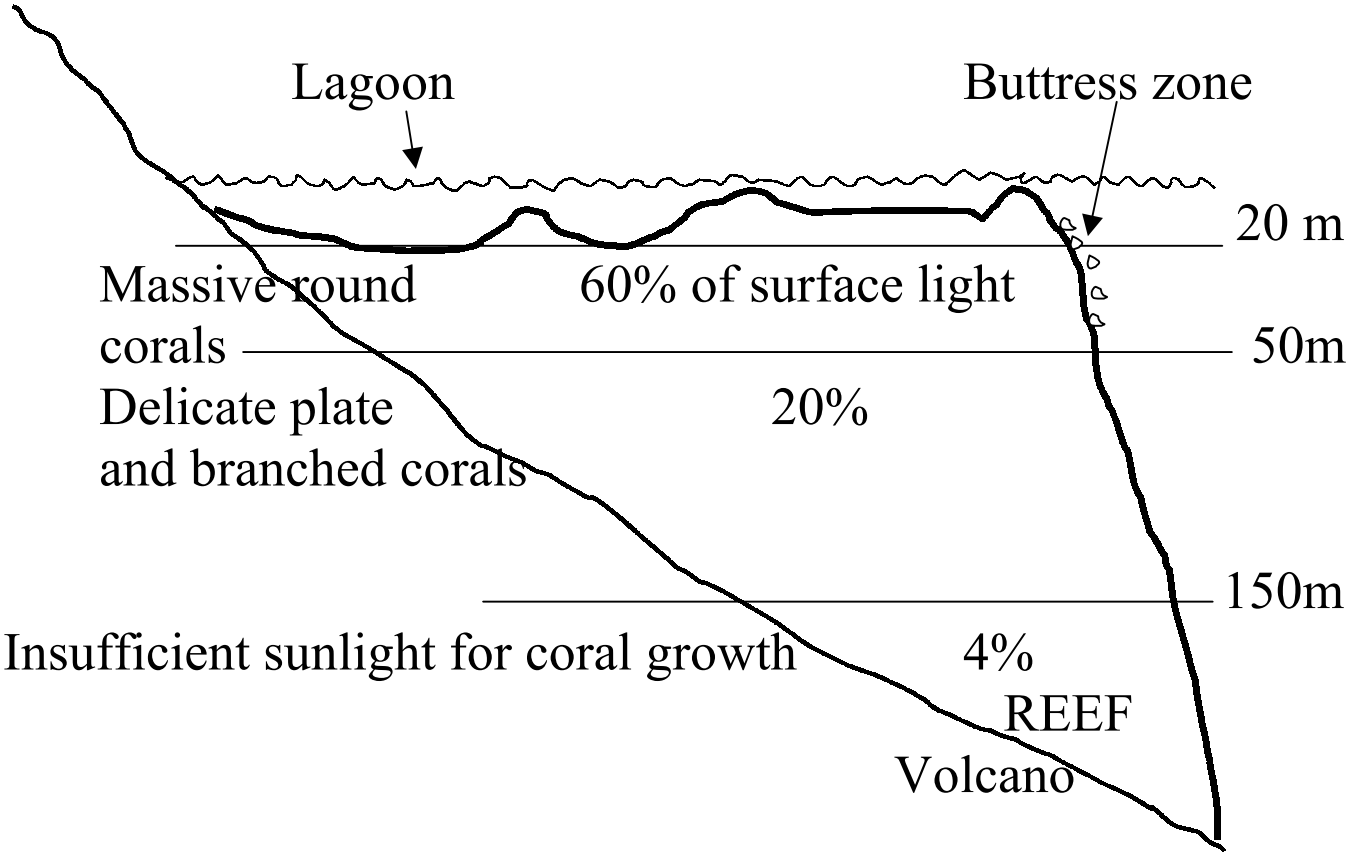
- Great Barrier Reef (Australia)
- Indonesian reefs
- Florida Keys
- Bahamas coral reefs

} important real estate

What are coral reefs?

- limestone mounds formed by
- coral animals and plants producing calcium carbonate;
- coral animal is a polyp (similar to anemone)
- living in symbiosis with **zooxanthellae**-algae (live within the polyp's tissue)

Coral reef zonation



Complex assemblages

- intense competition for space and food
- the most diverse marine community (25% of all marine species)
- algae, sponges and corals constantly growing and killing each other
- many colorful reef fishes, snails, shrimps, octopus, worms, clams, eels, crabs, seahorses, sea urchins, sea cucumbers lobsters…

Threats to Coral Reefs

A. Temperature increase

⇓

<u>Coral bleaching</u>

- expulsion of zooxanthelae algae from the polyp that leads to loss of color
- some corals recover some don't
- El Nino 1982/83 → > 70% corals died in the Central American Pacific

B. Nutrient increase
   - Algal blooms smother corals
   - phytoplankton reduces clarity of water

C. Sedimentation brought by surface runoff → chokes polyps

<u>Bioerosion of coral reefs</u>

- crown of thorns sea star, sea urchins erode corals by grazing on polyps
- new diseases