

Coral reefs, we don't know what we have until it's gone

- Beatriz Marín Díaz - Biología Ambiental - Universitat Autònoma de Barcelona -

THE TROPICAL CORAL REEFS

The tropical coral reefs are global centers of biodiversity, and the most widely distributed reefs (Fig. 1). They are being degraded by several factors, both direct human impacts such as climate change.

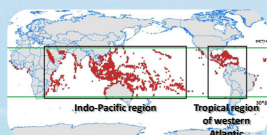
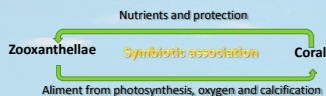


Fig. 1. Distribution of tropical coral reefs [2]



Coral species are long-lived and slow growing, so damages are often important.

BIODIVERSITY

Most diverse and complex communities of the planet, mainly fish and invertebrates

- Include between 1/3 and 1/4 of the marine species.

- Some studies report that this biodiversity is being underestimated.

- Almost 1/3 of coral species are endangered.

ESTATE OF THE REEFS

2008 data [2]:

- ✓ 19% of the original area is lost
- ✓ 15% are in critical state
- ✓ 20% are threatened
- ✓ 46% are recovering or in good state

2011 data [3]:

- ✓ 25-30% of world coral reef have been degraded

Local and anthropogenic pressures

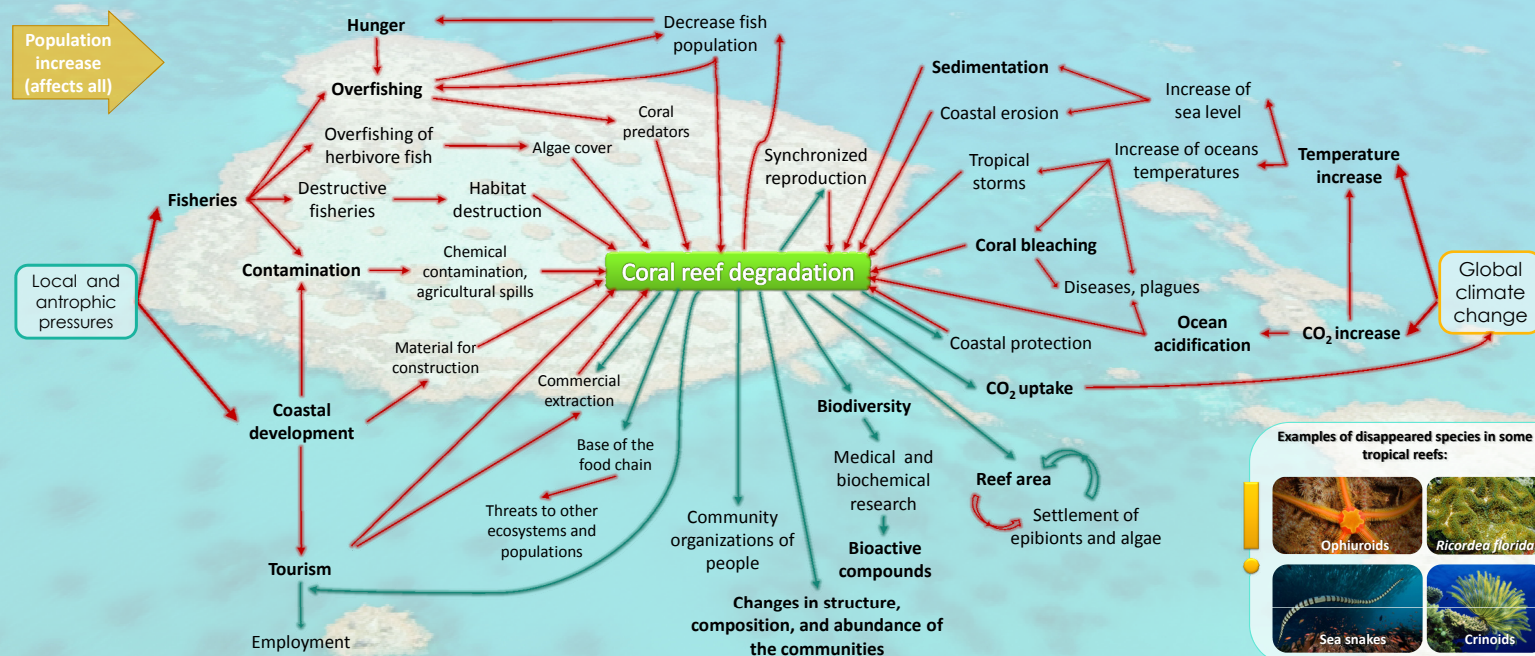
TROPICAL CORAL REEF THREATS

Climate global change



Coral reef degradation

INTERACTION BETWEEN THREATS AND EFFECTS



Importance of the EFFECTS of the DEGRADATION

Reduction of reef area

Since 1950 tropical reefs have lost more than 19% of its area.

Changes in structure, composition, and abundance of the communities of coral reef

Reef ecosystems will be replaced by ecosystems with less biodiversity and less productivity. Reefs that remain will be stronger but less attractive.

Loss of biodiversity

33% of coral reef species are endangered. ¼ of the marine species depend on coral reef, so if reefs disappear, they will be also affected.

Indirect effects:

Damage or destruction of coral colonies causes epibiont and algae settlement

More loss of reef area

Alteration of the carbon balance

Degraded reef

Less sink of CO₂

Climate change could increase

*Coral reef are capable of absorbing more CO₂ than rainforests

Effects on population (goods and services affected)

Reefs are a source of income, food and coastal protection for over 500 million people worldwide and more than 100 million people depend economically on these.

Fisheries

Decrease of abundance and diversity of commercial species of coral reef fishes.

More overfishing

Hunger

*12-14% of world fisheries are linked to coral reefs.

Reduction of coastal protection

Against tsunamis, erosive processes, tidal waves, etc.



Loss of bioactive compounds

Many species are used in medical and biochemical research. It won't be possible to discover new possible compounds.



Loss of tourism, recreation and associations of people

Economic losses (hotels, diving centers, commerce, jewelry). Loss of people associations that offer goods and services to tourists and improved the wellbeing of the community.

Problem: This activities also cause degradation of coral reef.

Conclusions

Currently we have enough data to assume that **there is a real effect** both on **global level** and **ecosystem level** (ex. goods and services). To make decisions about how to handle this matter properly, we should do a **better monitoring** of the situation to obtain good data.

Two **major problems** for face the recuperation:

Coral reef have resisted **increases in temperature** and **pH increases** separately, but **not both factors together**.

Coral reefs are resilient and can recover even slowly, but now, the **damages are occurring too fast**.

Previsions for the future

If the CO₂ emissions continue this way, it is expected that by the end of the century:

Sea level: ↑1,7m

Surface temperatures of the ocean: ↑2-3°C

Frequency of tropical storms will increase

↓pH of the oceans: 8,1 → 7,9

More degradation and by 2050 all reef endangered