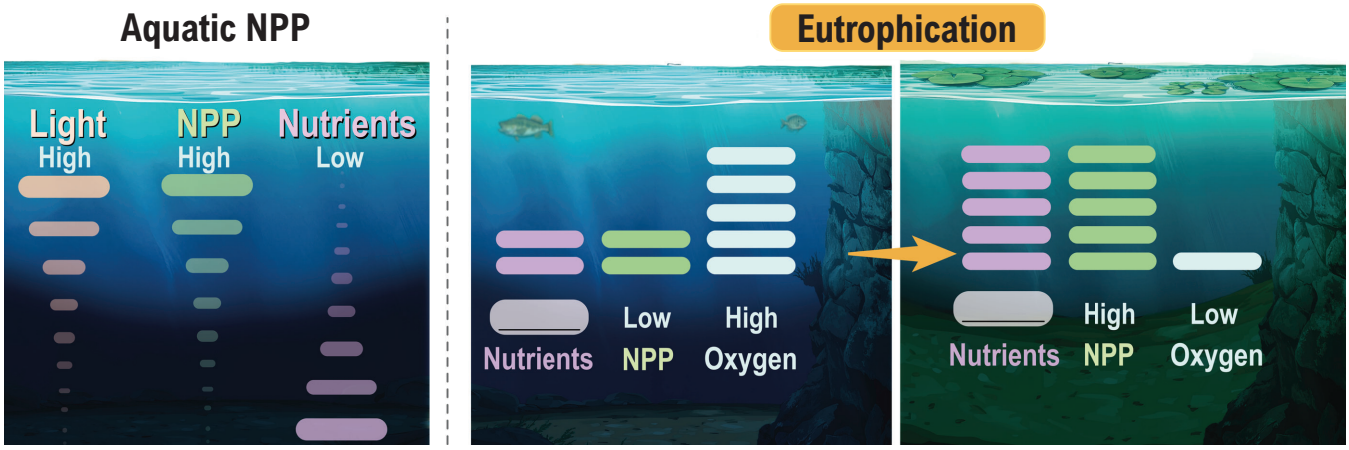
TOPIC: FACTORS IMPACTING PRIMARY PRODUCTION

Primary Production in Aquatic Ecosystems

◆ Two factors primarily dictate aquatic net primary production: _____ & *nutrients*.

- **Depth of Light Penetration:** aquatic productivity is _____ in surface water where light reaches.
- **Nutrients:** usually nitrogen (____) & phosphorous (____) are *limiting* nutrients; tend to sink with detritus.
  - **Eutrophication:** ecosystem becoming nutrient-_____; increases production but depletes _____.



NOTE: Coral reefs are the most productive aquatic ecosystem while open oceans are the least productive per m^2.

EXAMPLE

Interpret the data in the table. Which of the following is considered a limiting nutrient in this scenario?

a) Phosphorus.
b) Nitrogen.
c) Iron.
d) Potassium.

Nutrients Added to Experimental Culture	Relative Uptake of ^{14}C by Cultures
None (Control)	1.00
Nitrogen (N) + Phosphorus (P) only	1.13
N + P + metals (excluding Fe)	1.14
N + P + metals (including Fe)	9.63

PRACTICE

Which of the following ecosystems would you expect to have the lowest net productivity per cubic meter?

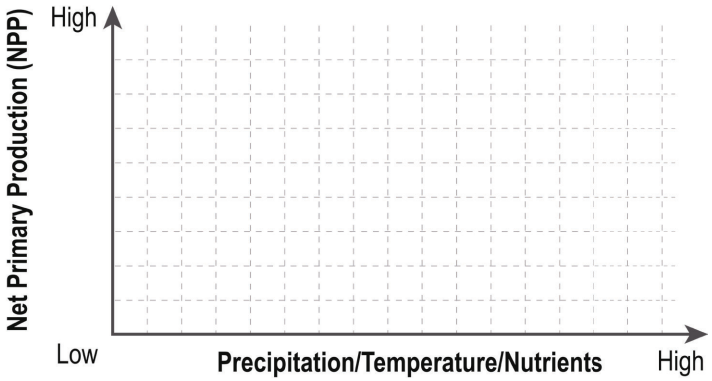
a) The open ocean (0m-10m deep).
b) An estuary.
c) The open ocean (20m-50m deep).
d) A coral reef.

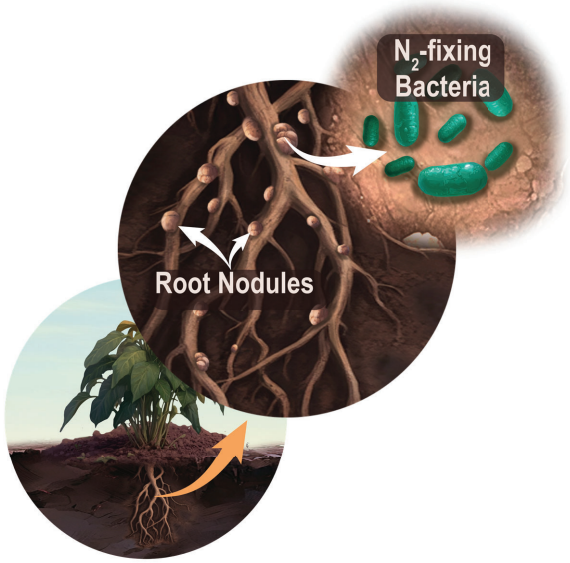
TOPIC: FACTORS IMPACTING PRIMARY PRODUCTION

Primary Production in Terrestrial Ecosystems

◆ Terrestrial net primary production _____ with *moisture*, *temperature*, & *nutrients*.

- **Nutrients:** usually _____ & _____ are *limiting* nutrients. Plants adapted to maximize nutrient uptake.





NOTE: Tropical rainforests are the most productive terrestrial ecosystem while deserts/tundra are least productive.

PRACTICE

Which of the following ecosystems would you expect to have the lowest net primary productivity?

a) Temperate broadleaf forest.
b) Tropical rainforest.
c) Temperate grassland.
d) The Sahara Desert.