

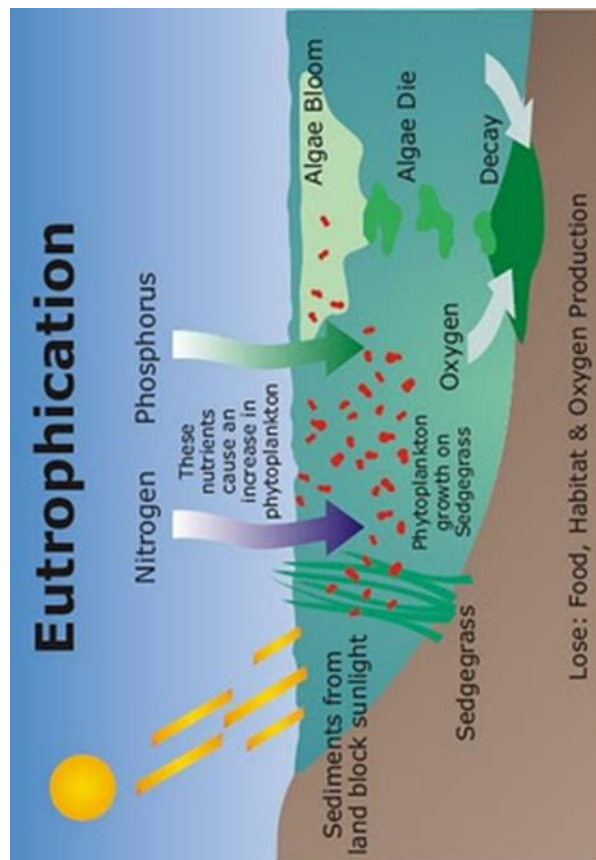


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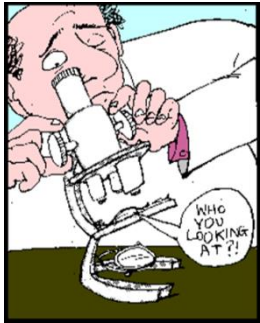
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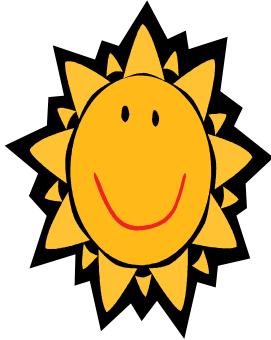
Centre for Ecology & Hydrology

NATURAL ENVIRONMENT RESEARCH COUNCIL

What Are Algae?



Microscopic – Some are so small you need a microscope to see them



Photosynthetic – They use sunlight to make their food



Phytoplankton – plant like organisms which live in water



Food – Eaten by tiny animals which are eaten by fish. These fish can be caught by fisherman and eaten by you

Phytoplankton

YUM

Zooplankton

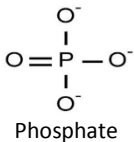
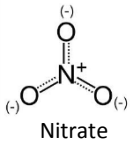
YUM

Fish

YUM

Humans

What Do Excessive Nutrients Do To Our Waterways?



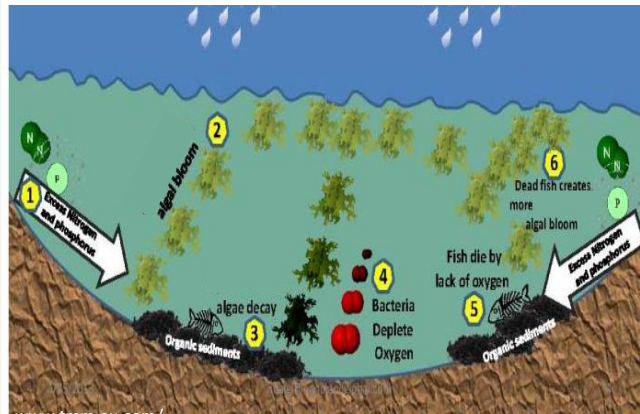
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Answer: Promote excessive growth of algae. As the algae die and decompose, high levels of organic matter and the decomposing organisms deplete the water of available oxygen, causing the death of other organisms, such as fish.

Where do the nutrients come from?

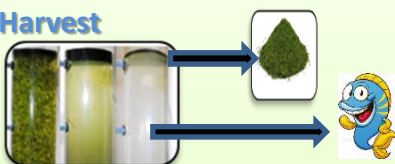
- Farmers add fertilizer containing nutrients (nitrate and phosphate) to increase the growth of crops
- Animal waste (sewage) also contains nitrate and phosphate
- PROBLEM:** Nutrient run-off from farm land and inputs from sewage can cause algal blooms.



Impact of algal blooms?

- On Nature:** Suffocates fish and algal toxins can poison wildlife (mammals, fish, birds)
- On Humans:** Limit our water supply and close fishing spots and beaches
- Scale:** 30-40% of the world's lakes and reservoirs are eutrophic
- In England:** 77% of surface water is eutrophic

Harvest



- Our research at The University of Sheffield aims to harvest algae from eutrophic waterways using a novel, award-winning device
- Device allows very small bubbles (microbubbles) to be generated
- Bubbles + flocculant (a substance which causes the algae to stick together) concentrates the algae at the surface
- Harvest algae
- Clean water + recovered biomass

Can we use this algae?

YES WE CAN



Potential biomass use:

Fertilizer:

- Extract phosphorus from algae and use to grow crops

Protein:

- Use to feed farm animals and fish

Biomass:

- Feedstock for generating energy via Anaerobic Digestion

Biofuel:

- Extract lipids from algae and use to make fuel for cars and airplanes

Further Information:

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