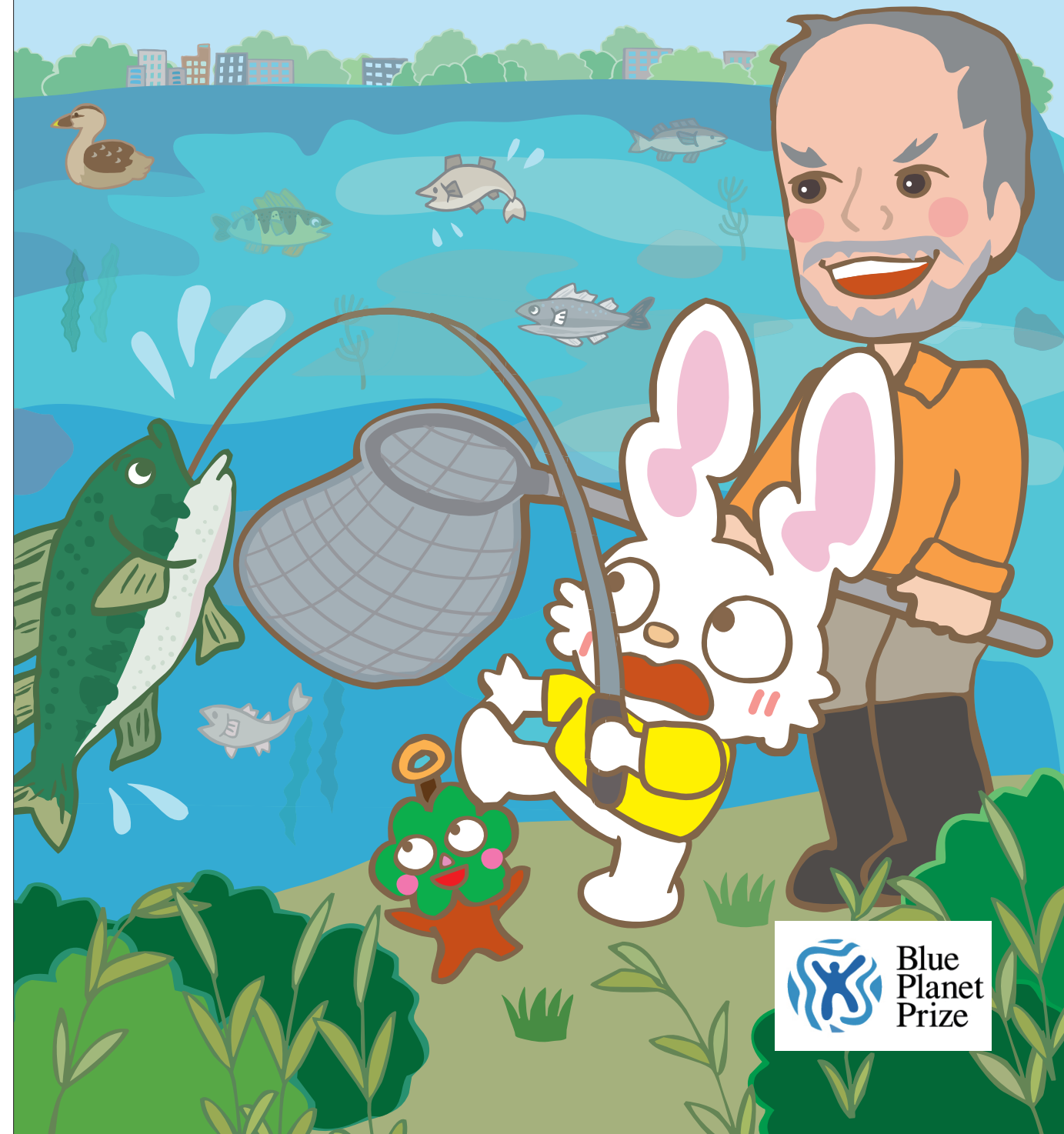
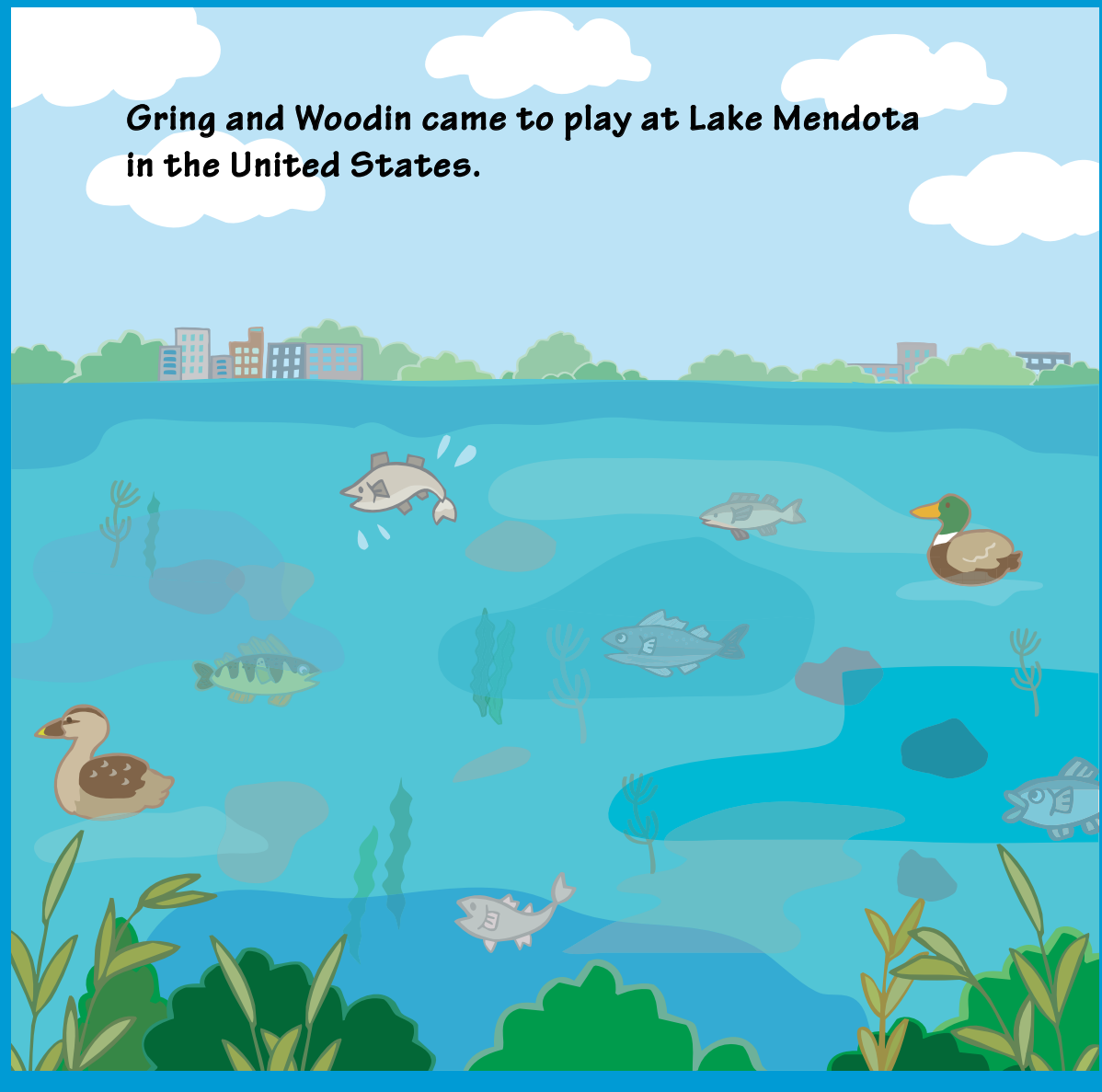


Prof. Carpenter's Fun School

14th issue, January 2024

What is eutrophication?





Gring and Woodin came to play at Lake Mendota in the United States.



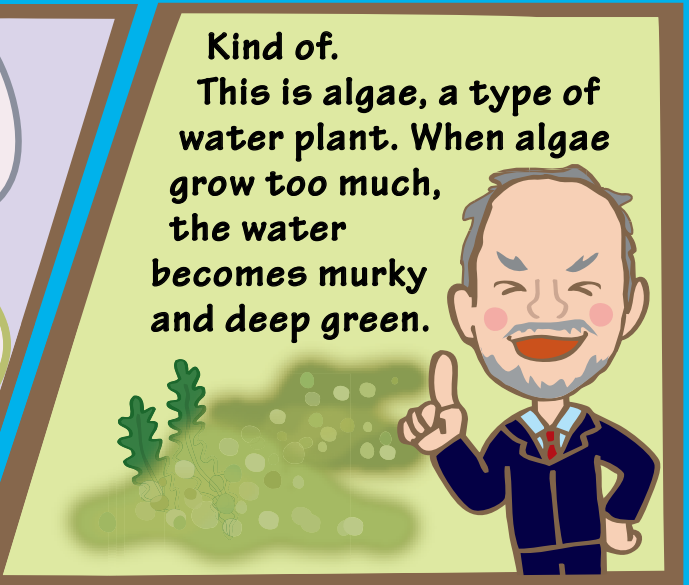
But it used to be green and murky. My research started because I wanted to make this lake clean.

How did you make it clean?



Why do you think the water turned green?

Hmm, grass?



Kind of. This is algae, a type of water plant. When algae grow too much, the water becomes murky and deep green.



Wow, this lake is huge!

It's so clear and beautiful!



Isn't it great? This lake is my old friend.

Professor Stephen Carpenter

2022 Laureate of the Blue Planet Prize



Why did the algae grow so much???



If you want to make flowers bloom beautifully, what else is needed besides water?

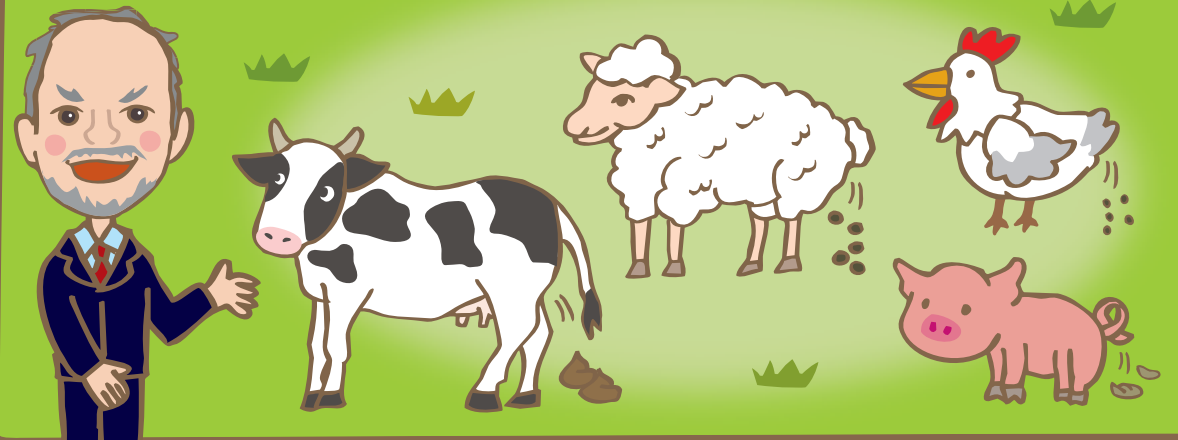
Fertilizer?

Hmm

Yes! Fertilizer. Algae are plants, so they grow more when they have nutrients.



Poop and pee from farm animals contain nutrients.



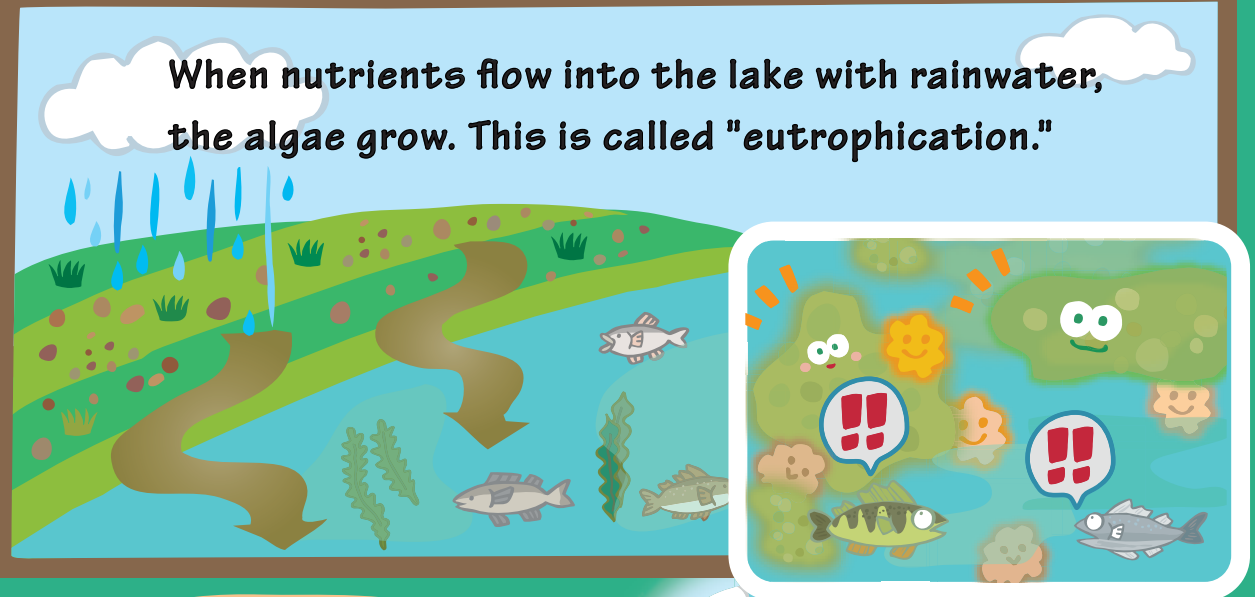
Did someone give fertilizer to the algae?



Not directly to the algae. A lot of fertilizer is used to grow crops on farmland around the lake.



When nutrients flow into the lake with rainwater, the algae grow. This is called "eutrophication."



I see. But isn't it a good thing for the lake to be nutrient-rich?



Too much algae is bad. When there is too much algae, the oxygen in the water decreases and fish and other animals die. When many animals die, the water becomes dirty. And the lake becomes a different place.

That's terrible! Is there any way to fix it?

What I tried in Lake Mendota was to increase the number of large fish to reduce algae.

Large fish eat algae, right?

No, large fish don't eat algae.

Huh?

No!

Large fish eat small fish.

Small fish eat zooplankton.

Zooplankton eat algae.

When the number of large fish increases... Small fish are eaten and numbers decrease.

When the number of small fish decreases... Zooplankton are not eaten so much and numbers increase.

When the number of zooplankton increases... Algae are eaten and decrease. As a result, the lake becomes clean.

Hmm, that's complicated.

In this way, the creatures of the lake maintain balance by eating and being eaten. It's crucial to preserve this balance to protect natural environments like lakes.

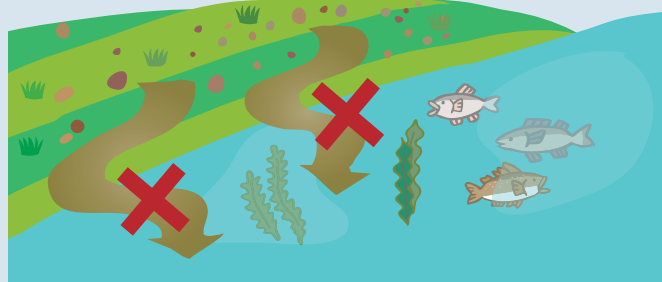
I'm so glad Lake Mendota is clean again.

But it doesn't always work. For example, if nutrients continue to flow into the lake for a long time and accumulate at the bottom of the lake, it becomes very difficult to restore the lake to its original state.

What can we do?



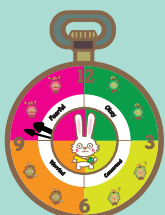
It is difficult to remove nutrients that have accumulated at the bottom, so it is important to think of ways to prevent nutrients from flowing into the lake in the first place.



Another important thing is to let everyone know that human activities can have unexpected impacts on nature, and to learn together. When explaining, you can draw pictures, make stories, or perform plays.



I can do that!
Thank you,
Professor!



Environmental
Doomsday Clock

Prof. Carpenter's Fun School
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