
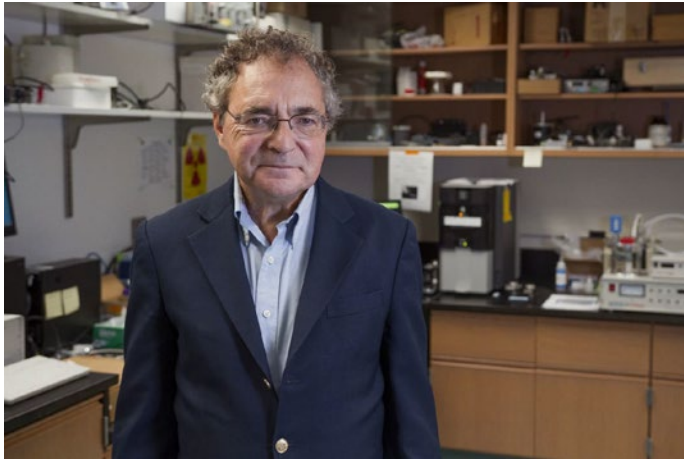


# Microscopic life makes huge impact on Earth's climate

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*Paul Falkowski, a Rutgers professor and researcher, has won the 2018 Tyler Prize for Environmental Achievement. Called the Nobel Prize of environmental science, it comes with a \$200,000 award, which he will share with co-winner James J. McCarthy of Harvard University.*

Rutgers University Professor Paul Falkowski has studied the oceans' microscopic phytoplankton for decades. He has found they provide 45 percent of Earth's oxygen and convert almost as much carbon dioxide to energy as land plants do.

Phytoplankton, which use photosynthesis to convert carbon dioxide to energy and give off oxygen, evolved about two million years before plants. They created the planet's original oxygen and changed the Earth's climate so land-based life could evolve, Falkowski said.

They also sequester carbon dioxide in the deep ocean.

Falkowski will receive the 2018 Tyler Prize for Environmental Achievement Thursday for his work explaining the evolution of our modern climate, in a ceremony at the Willard Intercontinental Hotel in Washington, D.C.

The international award puts Falkowski, who grew up in Harlem in Manhattan and went to City College of New York, at the pinnacle of his field.

"(Phytoplankton) are the beginning of the energy supply for fish and all ocean life. Anything people pull out with a fishing line has at some point gotten nourishment from them," said Falkowski, who lives in Princeton. "They are the grass of the sea."

Falkowski shares the \$200,000 prize with James J. McCarthy of Harvard University. McCarthy's work has helped explain how climate affects the production of plankton and the marine organisms that consume plankton, according to the Tyler organization.

"The good news about phytoplankton — when they die they go into the sediments, and after they are buried for millions of years become the fossil fuels we put into our cars or trucks," said Falkowski.

So we are really filling up with phytoplankton when we go to a gas station, he said.

But in one year we extract fuels it took 1 million years for Earth's processes to create, he said.

"We have technology that can convert phytoplankton into biodiesel," he said, which is carbon-neutral when burned. But when oil is cheap, it can't be price-competitive. And there are limits to how much can be made.

Biodiesel costs about \$100 to \$120 per barrel, he said. Current oil prices are at about \$68 per barrel.

If all cars became electric, phytoplankton could provide enough fuel for the nation's trucks, ships, trains and airplanes, he said.

Japan and India, which have no natural oil, are working on making biofuel at a lower cost. Falkowski predicted that in the next 10 years, biofuels will be available at a price point competitive with drilling for oil.

Phytoplankton are diverse organisms that evolved about 2.5 billion years ago, and gave rise to Earth's original oxygen, Falkowski said.

Plants didn't evolve until about 450 million years ago, Falkowski said.

We know how old the microscopic organisms are, because they have left a fossil record that can be seen with microscopes, Falkowski said.

"There are micropaleontologists who study the fossils of plankton," he said.

Falkowski got his undergraduate and master's degrees at City College, then went the University of British Columbia for his doctorate. He did a brief post doc at the University of Rhode Island, then spent 23 years at Brookhaven National Laboratory on Long Island.

He moved his research group, now numbered at 18, to Rutgers in 1998, he said.

Today he continues to research photosynthesis in the ocean, and is studying how corals make rocks. He has recently gotten funding from NASA, where he is a member of its Astrobiology Institute, to study the evolution of the earliest proteins that made life.

NASA wants to understand Earth's earliest life, to potentially recognize life within the solar system and beyond, he said.

Falkowski said he's "extremely surprised and very, very proud" to have won the Tyler Prize, which was established in 1973 by the late John and Alice Tyler and is administered by the University of Southern California.

"It's been won by very famous people in science over the years," he said. "It's an honor to me and my colleagues who have worked with me over the years. I share it with my colleague at Rutgers."

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