New science standards draw praise, criticism for undoubting take on humans' role in climate change

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South Dakota took part in a 26-state effort to update the way K-12 schools teach science, but the resulting standards face a series of hurdles on the way to implementation.

The Next Generation Science Standards, released this month, emphasize the practice of science and critical thinking in place of rote memorization. But the standards, which map out what students should know and be able to do, already are drawing both praise and criticism for their undoubting take on humans' role in climate change.

One of the core ideas in the standards is that "Human activities, such as the release of greenhouse gases from burning fossil fuels, are major factors in the current rise in Earth's mean surface temperature (global warming)."

That idea is not controversial among the 41 scientists and educators who wrote the standards. But many politicians consider man's impact on global climate change to be unresolved.

Three years ago, the South Dakota Legislature passed a non-binding resolution that urged public schools to take a "balanced approach" when teaching climate change. It asserted the science on the subject is unsettled, open to interpretation and prejudiced by politics.

The Heartland Institute, a conservative think tank that casts doubt on climate science, says the Next Generation standards "convey an anti-human message regarding human activities, population growth and environmental impacts that is not scientifically justified. They certainly convey an environmental activist bias."

Mario Molina, deputy director at Alliance for Climate Education, praised the standards.

"There is no more important lesson that students should be learning right now" than climate change and what humans can do about it, he said. "Students have the right to know what the reality is."

States can decide to adopt standards

It'll be up to each state to decide whether to adopt the Next Generation standards in place of what their schools now follow.

South Dakota last updated its science standards in 2005. When they were scheduled for an update last year, the Department of Education chose to wait because the Next Generation standards were coming out soon.

South Dakota was one of 26 lead states for the new standards, with around 80 educators, business leaders and science professionals from the state participating.

But being a lead state doesn't mean South Dakota will necessarily adopt the standards. Mary Stadick Smith, deputy secretary for the Department of Education, said there is no timeline for the agency's review of the standards.

"We need to review them carefully and we're going to move forward cautiously to make sure these are the right things for our students," she said.

The science standards South Dakota now uses are some of the worst in the country, according to a 2012 review by the Fordham Institute, an Ohio-based education think tank, which gave South Dakota one of its 10 F grades.

Julie Olson, a Mitchell High School biology and environmental science teacher, was one of the 41 people from across the country who wrote the Next Generation standards.

"Being a writer, I think it's important. There's a lot of really good things that would come out of these. I would hope

that South Dakota adopts them," she said.

If the department recommends adoption, it ultimately would be the South Dakota Board of Education's call. Stadick Smith said there first would be public hearings in Sioux Falls, Rapid City, Pierre and Aberdeen. The Legislature passed a bill in 2012 requiring those hearings for any future adoption of Common Core Standards; the Next Generation Science Standards are separate from the Common Core initiative, but she said "internally, we would plan to do that … even though we wouldn't have to."

Standards getting more negative attention

The sponsor of that law, Rep. Jim Bolin, R-Canton, has been suspicious of multi-state standards initiatives, such as the Common Core Standards in math and English language arts, which South Dakota adopted in 2010.

This year, he tried and failed to put such standards adoptions in the hands of the Legislature, rather than the appointed Board of Education.

Bolin hasn't been following the effort to draft new science standards, but he's likely to oppose them.

"Just on principle, I oppose – and I think there's lots of other people too who oppose – any kind of effort to bind South Dakota to any of these national standards, essentially in any subject," he said. "I can't say that I have a detailed knowledge of science standards in our state, but I have every expectation and belief that they are very adequate."

There was virtually no opposition when South Dakota adopted the Common Core Standards in math and English language arts. But the standards are getting more negative attention now — partly because the Obama administration has endorsed them — and the Republican National Committee last week passed a resolution calling them "an inappropriate overreach to standardize and control the education of our children so they will conform to a preconceived 'normal.'"

That might put pressure on South Dakota Republicans to question the new science standards too.

Bolin said he's "very grateful" that state officials have decided to hold multiple hearings if and when they move toward adoption.

Bolin voted for Rep. Don Kopp's 2010 resolution on balance in science instruction, and he expects lawmakers could again take action on that front if the Next Generation standards advance.

"I think it's safe to say … that would be a flashpoint for a lot of people in the Legislature," he said.

Sam Shaw, who works in curriculum for the Department of Education, said the Next Generation process benefitted from the participation of South Dakotans.

He said one of the state's big concerns was that the standards would try to cover too many concepts. The final draft cut out several performance expectations, he said, which will allow students to focus on fewer topics and in great depth.

Shaw said a limitation of South Dakota's science standards is that science content is separate from science practices, so that "students weren't really investigating the content." The Next Generation standards remedy that. As an example, students might analyze earthquake data to calculate the epicenter, tying in the content about tectonic plates and the practice of data analysis.

"Students need to reason through data," he said.

Colleen O'Neil, the Department of Education's curriculum director, said the Next Generation standards focus on depth of knowledge, rather than breadth, which would be a change for the state.

“Science in 2013 is about depth and it’s about the critical thinking skills,” she said.

Shaw said the new standards are well organized and build on previous lessons as students advance through the grades.

Jill Weimer, an associate scientist for Sanford Research, was among the industry representatives who reviewed the Next Generation standards. That’s a departure from the state’s current science standards, which were assembled by educators.

That process, she said, ensures that what students learn in school “really is what I need students to know” if they go on to study and work in science.

Olson, the Mitchell science teacher, said the standards introduce skills that can be applied across all the sciences, as well as English and math. They also include a fair amount of engineering, which has not been the case in South Dakota schools.

“I think a lot of teachers do engineering activities; it’s just we’ve never emphasized that,” she said, so kids leave school without a good understanding of that subject. “I think this is really going to boost the concept of engineering, so hopefully we’ll have more kids who graduate wanting to go into engineering.”