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Gov. Kate Brown's office says she will propose legislation to maximize state investment returns...

Brown plans bill to maximize state investment returns

SALEM — Oregon Gov. Kate Brown plans to advance a bill in the upcoming legislative session aimed at maximizing returns on the state's investments...
Tuesday, said that he would support the Governor's Office in its efforts and emphasized communication with the public and the Oregon Legislature about the state's investing.

Scientists go all out with first aquatic species map for U.S. West

By KEITH RIDLER
Associated Press

BOISE, Idaho — It sounds like a big fish story: a plan to create a biodiversity map identifying thousands of aquatic species in every river and stream in the western U.S.

But scientists say they're steadily reeling in that whopper and by next summer will have the first Aquatic Environmental DNA Atlas available for the public.

Boise-based U.S. Forest Service fisheries biologist Dan Isaak is leading the project and says such a map could help with land management decisions and deciding where to spend limited money and resources.

"It's kind of the Holy Grail for biologists to know what a true biodiversity map looks like," he said. "To have that formatted digitally so you can do lots of science with it will be transformative in terms of the quality of information we'll have to conserve species."

Isaak said annual surveys could provide snapshots so scientists can see how biodiversity and ecosystems change over time. Because of the project's immense scale, he said, sample collecting likely will require help from many entities, including citizen scientists.

The map eventually will include everything from insects to salmon to river otters. It's possible because of a new technology that can identify stream inhabitants by analyzing water samples containing DNA. The technology also can be used to identify invasive species.

That technology is evolving, said Michael Schwartz, the Forest Service's director of the National Genomics Center for Wildlife and Fish Conservation in Missoula, Montana. Currently, he said, scientists can detect only one species at a time in a stream sample. He said the goal is to identify multiple species in a single test from one sample. A rough estimate for when that might be possible is about a year, he said.

The trove of information has the potential to be so vast that questions not presently imagined might arise.

"Any time science undertakes large projects like this, the payouts can be in directions you don't expect," Schwartz said.

Ultimately, he said, the publicly available information could be used by someone with an iPad or other device



Kellie Carim/U.S. Forest Service via AP

This 2014 photo provided by the U.S. Forest Service shows Michael K. Schwartz in the process of filtering 5 liters of water to concentrate DNA on a filter to be analyzed at the National Genomics Center for Wildlife and Fish Conservation, on Rattlesnake Creek near Missoula, Mont. Scientists are aiming to create a biodiversity map that identifies thousands of aquatic species in every river and stream in the western United States. They say that by next summer, the first Aquatic Environmental DNA Atlas will be available to the public.

"It's kind of the Holy Grail for biologists to know what a true biodiversity map looks like."

- Dan Isaak, U.S. Forest Service fisheries biologist

who could go to a section of river and see what species it contains.

The Aquatic Environmental DNA Atlas for the western U.S. has its genesis in a smaller-scale project called the Bull Trout Environmental DNA Atlas involving five states — Idaho, Montana, Nevada, Oregon and Washington — where the federally protected fish is found. That effort, Isaak said, has discovered bull trout in areas where they were thought not to exist.

Isaak also has been working on something called the Cold Water Climate Shield to identify streams that could serve as a refuge for cold water species, such as bull trout, if global warming continues. That map uses

millions of temperature recordings going back decades and has expanded to include most of the western U.S. Stream temperatures in lower elevations have risen several degrees over the past 30 years, Isaak said. The DNA Atlas has been confirming the kind of species present as predicted by the Cold Water Climate Shield, Schwartz said.

What scientists ultimately hope to do is combine all the information from stream temperatures, DNA Atlas sampling, topography and weather patterns to get more insights into species distribution patterns and even how entire ecosystems function.

"The data sets can be bigger because computers are bigger," Isaak said.

Even for Isaak, who is called a visionary by his colleagues, the leaps in technology that make his ideas possible can be mind-boggling.

"It's just been an ongoing revelation," he said, recalling 15 years ago using pencil and paper to make streamside observations. "It still seems like magic to me that you can take a water sample and you have instruments powerful enough to discern what species are present."

Corrections

The East Oregonian works hard to be accurate and sincerely regrets any errors. If you notice a mistake in the paper, please call 541-966-0818.

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AccuWeather.com Forecast
Today: Cloudy with a bit of rain
Saturday: Cloudy with a shower or two
Sunday: Partial sunshine
Monday: Mostly cloudy with a shower
Tuesday: Times of sun and clouds
Pendleton Temperature Forecast: 52° 41° 48° 36° 45° 37° 46° 33° 46° 36°
Hermiston Temperature Forecast: 54° 40° 51° 37° 49° 40° 52° 33° 51° 37°

ALMANAC

PENDLETON

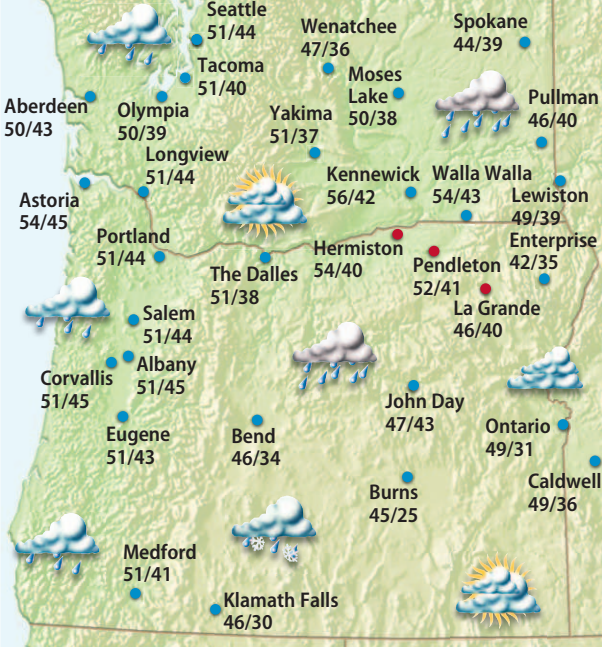
through 3 p.m. yesterday
TEMPERATURE HIGH 50° LOW 38°
Normal 45° 31°
Records 71° (1960) -11° (1985)
PRECIPITATION 24 hours ending 3 p.m. Trace
Month to date 0.78"
Normal month to date 1.14"
Year to date 11.17"
Last year to date 7.81"
Normal year to date 11.17"

HERMISTON

through 3 p.m. yesterday
TEMPERATURE HIGH 56° LOW 40°
Normal 46° 31°
Records 70° (1959) -11° (1985)
PRECIPITATION 24 hours ending 3 p.m. Trace
Month to date 0.52"
Normal month to date 0.93"
Year to date 7.85"
Last year to date 5.39"
Normal year to date 8.24"

SUN AND MOON

Sunrise today 7:08 a.m.
Sunset tonight 4:16 p.m.
Moonrise today 3:13 a.m.
Moonset today 2:46 p.m.
Nov 29 Dec 7 Dec 13 Dec 20

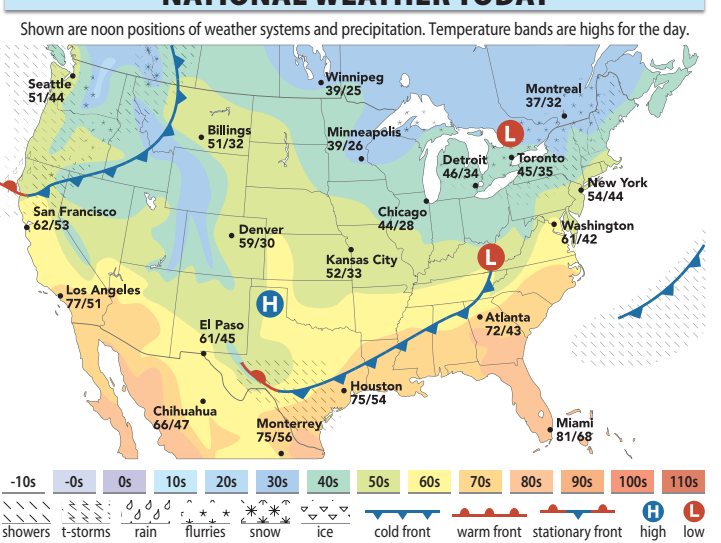


Regional Forecast
Coastal Oregon: Rain today. Cloudy tonight; periods of rain, some heavy, but a shower across the north.
Eastern and Central Oregon: Cloudy today. Rain across the north and in central parts; showers of rain and snow near the Cascades.
Western Washington: Mostly cloudy today and tonight with a stray shower.
Eastern Washington: Cloudy today. A bit of snow in the mountains; a little rain across the south and near the Idaho border.
Cascades: Snow today, accumulating 1-2 inches, but a rain or snow shower in the south.
Northern California: Cloudy today; rain, heavy at times, except dry in the interior mountains.

REGIONAL CITIES

Table with 4 columns: City, Today (Hi Lo W), Sat. (Hi Lo W). Includes cities like Astoria, Baker City, Bend, Brookings, Burns, Enterprise, Eugene, etc.

NATIONAL WEATHER TODAY



Shown are noon positions of weather systems and precipitation. Temperature bands are highs for the day.
Yesterday's National Extremes: (for the 48 contiguous states)
High 88° in Edinburg, Texas Low -3° in Bodie State Park, Calif.

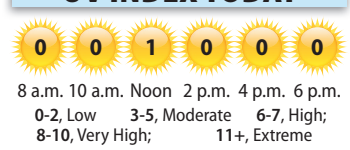
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WINDS

Table with 3 columns: City, Today (in mph), Saturday (in mph). Includes Boardman, Pendleton.

UV INDEX TODAY



8 a.m. 10 a.m. Noon 2 p.m. 4 p.m. 6 p.m.
0-2, Low 3-5, Moderate 6-7, High; 8-10, Very High; 11+, Extreme
The higher the AccuWeather.com UV Index™ number, the greater the need for eye and skin protection.

NATIONAL CITIES

Table with 4 columns: City, Today (Hi Lo W), Sat. (Hi Lo W). Includes Albuquerque, Atlanta, Atlanta City, Baltimore, Billings, Birmingham, Boise, Boston, Charleston, SC, etc.