

**NOISE OR TRUTH?**

# Scientists work to see a future with natural variances

*This is the second of two stories looking at how scientists are interpreting strange weather, ocean conditions and animal sightings in 2014, and what it all could mean for salmon, fishermen and the economy.*

By **KATIE WILSON**  
EO Media Group

There's the regular kind of noise: cars backfiring, planes overhead, the bark of guns during deer season, fishing boats creaking at anchor, cargo ships on the Columbia River bellowing in the fog.

Then there is "noise" in a scientific/statistical sense.

This year was one of the best years for salmon fishermen in Oregon and Washington: "There's so many fish rolling in this year," said Ron Roler, Columbia River policy coordinator for the Washington Department of Fish and Wildlife in August. "The sheer numbers are just so huge it almost defies logic."

But it wasn't such a great year for crab. The crab that were out there were "beautiful," said fisheries managers, and fishermen were pulling in good money per pound. They just weren't finding that many.

"It's the cyclical nature of these fisheries," fishery managers explained over and over. And they were right.

Those ups and downs are not unusual. Neither was the mass of warm water moving off the West Coast — the Blob — that brought many strange marine animals to colder waters here. Researchers call these things "noise": abundance one year, scarcity the next, fluctuations in temperatures and weather patterns.

For those attempting to predict the effects of climate change in the future, the challenge is to separate out that normal noise from the rising clamor of climate change.

"The climate is changing, but right now we're still subject to all the vagaries," said Nick Bond, Washington state climatologist. But, he added, "The chemistry of the ocean is changing too. The longer you wait, the more things are going to chain. ... We'd like to know when we're getting into uncharted territories."

**Slippery studies**

It's difficult to tease the two apart: normal "noise" and climate change. In recent years, thousands of researchers have published thousands of studies around the world, but almost every year something changes: a calculation, a new understanding about a species, our own interests and responses.

Meanwhile, management practices are struggling to keep up as studies pile on top of each other, and both new and old data are examined and re-examined.

WDFW has slowly been integrating climate change models and information into how the department manages wildlife areas and identifies species to focus on, said Lynn Helbrecht, climate change coordinator with WDFW.

"We're in the throes of that, if you will," Helbrecht said. "We're looking at different approaches for doing what we do."

For example, the department is considering changes in how it determines culvert specifications for fish passage.

"Our fisheries management system is constantly strapped for time," explained Malin Pinsky, an ecologist and assistant professor at Rutgers University, in a phone interview in December.

To change fisheries management as local species shift in response to climate change, "is hard to do," Pinsky said. "On the other hand, ignoring (the issues) isn't going to make them go away."

Pinsky himself is using 40-plus years of data gathered in surveys conducted by NOAA and Canadian fisheries to estimate fish abundance. Now, Pinsky is looking to this vast treasure trove of data to help predict the future of fish and fisheries in a changing landscape.

He is the lead researcher behind OceanAdapt, an online database launched in collaboration with NOAA that looks at how



TIFFANY BOOTH photo

**Sea turtles like this one have washed ashore near the mouth of the Columbia River this winter, one of many indications that ocean conditions are unusual. Scientists are trying to separate normal variability in the environment — sometimes called "noise" — from potentially serious long-term trends.**

species have shifted over the past decades. They have already found that many local species on both sides of the country are going deeper or farther north than usual.

The website was only just launched in December, but it is a tool Pinsky and his team hope to expand this year so that more people can access the data and understand it in a variety of contexts.

"We're seeing changes and they're very real," Pinsky said. "They're happening rapidly, but it's nothing like we'll see down the road. ... If global warming starts happening even more rapidly, I expect we'll see much more dramatic changes and much less predictable changes."

**Economics of change**

It's inside that "if" about the rate of change where economics crashes into climate change. Inside that "if," communities can emerge or disappear.

When Pinsky looks at how the West Coast states have allocated catch for commercial fisheries, he sees lines drawn around the fish populations, lines that were accurate and relevant for certain locations 20 or 30 years ago.

"For the most part, and to a large extent, those species aren't there anymore," he said.

A future with climate change looks like a future where traditional fishing grounds move elsewhere.

"You might have fishermen crossing state lines, you might have negotiations between states," Pinsky said. "It gets even more complicated when you have populations of fish crossing (national) boundaries ... you have to rapidly come up with how we are going to share the benefits of what used to be a resource controlled by one country."

"Considerations of long-term climate change do not appear prominently in the traditional fisheries science that guides management in North America, Europe, Australia and elsewhere around the world," wrote Pinsky and co-author Nathan J. Mantua of NOAA in a 2014 paper, "Emerging Adaptation Approaches for Climate-Ready Fisheries Management."

"We understand the physical climate relatively well," Pinsky said in a recent interview. "We understand the biology not all that well. We understand the social and economic side even less."

**The costs of change**

In the last dozen years, the costs of climate change have been estimated several times over on a global scale. In 2009, economists tried to bring that down to a personal level, lining numbers up to show what it could mean for the population of Washington.

In "An Overview of Potential Economic Costs to Washington of a Business-as-Usual Approach to Climate Change," the economists concluded that since Washington will likely be looking at reduced snow pack and lower river and stream levels in the coming years as a result of climate change, there could be a

reduction of almost \$150 million in hydropower generation by 2020.

There will likely be increased spending on air conditioning, an increase of about \$28 million by 2020 and \$65 million by 2040, \$164 million by 2080. In the meantime, there would likely be growing job market for green energy innovations.

"Those reports still stand," said Ernie Niemi, who had been a senior economist for ECONorthwest in 2009 and had prepared the report. "Some of the science has changed and the numbers, if anything, are likely larger now."

Take the rate of sea level rise. Since the reports came out in the 2009, the estimated rate of sea level rise since 1990 is "two or three times what was predicted," Niemi said.

Washington Gov. Jay Inslee called for a carbon emissions cap-and-trade plan recently, a plan that is now at play in the Legislature. Under his plan roughly 130 of Washington's biggest polluters would pay to produce specific amounts of carbon emissions — among the greenhouse gases considered the leading cause of global warming. These pollution quotas could be traded or sold to other business.

But the plan has encountered opposition and some say it wouldn't do enough to deal with climate change in myriad smaller ways.

Still, Tim Hill at the Office of the Columbia River, which oversees water issues on the eastern side of Washington, says he is seeing a lot of cooperation among people and agencies.

"We're seeing a lot of movement now, more movement than we've seen in decades, because people are working together now where they would have fought," he said. It's a banding together that he attributes to the threat of climate change.

Still, as Niemi wrote in the 2009 report for Washington, when people attempt to think about ways to reduce greenhouse gas emissions, "many have concluded that such actions should not be undertaken because their costs are too great."

He added, "They reach this conclusion, however, without

first seeing what the costs would be of not taking these actions and allowing climate change to continue unabated."

**Mapping the borders**

It's a question, in many ways, of risk.

"Economists for hundreds of years have wrestled with the concept of risk," Niemi said, and, often, they have nested that question of risk within markets. They determined that markets can handle risk. That's just what markets do.

"They thought they had conquered risk."

That changed after the market crash in 2007. They realized (perhaps not for the first time) that, Niemi said, "the techniques that work in the market generally don't work when you're talking about something that threatens civilization."

Climate change is certainly one such scenario, he said.

General Motors, for example, could disappear and right now it doesn't matter because, in theory, something else could fill that gap. But, Niemi said, "if civilization dies ... how do we think about that and make decisions in the context of that risk?"

With each study and each new piece of information, scientists like Pinsky, economists like Niemi, researchers and policy makers may not be able to answer the question, but they are beginning to map the borders.

"I think at the moment I mostly have a sense of hope," Pinsky said. "We have the basic building blocks to do what we need to do. It's just a matter of using them and the time is now. We don't have a lot of time, but I'm starting to see interest out there."

And Bond, thinking about the blob, said, "Climate change is the big elephant in the room." And he doesn't mean "the elephant we're ignoring." He means that it's literally an elephant in the living room. What on earth do you do with an elephant?

"Maybe looking at some smaller animal" — the Blob, the shifting species seen through data on OceanAdapt, the noise — "we can find out more about this elephant."

## SPORTS SCOREBOARD

PREP SCHEDULE	SWIMMING
<p><b>TUESDAY</b></p> <p><b>Girls Basketball</b> — Seaside at Astoria, 5:30 p.m.</p> <p><b>Boys Basketball</b> — Seaside at Astoria, 7:15 p.m.</p>	<p><b>HIGH SCHOOLS District 1/4A Meet at Astoria Aquatic Center</b></p> <p><b>Girls Team:</b> Valley Catholic 252, Tillamook 229, Newport 216, Scappoose 134, Astoria 130, Seaside 111, Taft 86, Rainier 55, Banks 11.</p> <p><b>200 Medley Relay:</b> 1, Valley Catholic, 2:02.59. 2, Astoria, 2:10.06. 3, Tillamook, 2:14.18.</p> <p><b>200 Freestyle:</b> 1, Sarah Krueger, VC, 1:57.29. 2, Clara Cannon, VC, 2:06.07. 3, Allison Bachart, New, 2:08.46.</p> <p><b>200 Individual Medley:</b> 1, Kathleen Shew, VC, 2:31.0. 2, Shannon Blackburn, New, 2:32.99. 3, Gabie Kreuger, Scp, 2:36.74.</p> <p><b>50 Freestyle:</b> 1, Hailey Moraes, VC, 25.89. 2, Clarisse Coventry, Sea, 26.63. 3, Alexa Ryer, New, 27.86.</p> <p><b>100 Butterfly:</b> 1, Sarah Krueger, VC, 1:00.55. 2, Alyssa Harkins, Sea, 1:07.15. 3, Ashley Schacher, Ast, 1:10.84.</p> <p><b>100 Freestyle:</b> 1, Kara Putman, Til, 56.91. 2, Hailey Moraes, VC, 58.77. 3, Allison Bachart, New, 58.92.</p> <p><b>500 Freestyle:</b> 1, Kathleen Shew, VC, 5:49.21. 2, Elena Elingson-Cosenza, New, 5:49.75. 3, Sabrina Polman, Til, 6:35.78.</p> <p><b>200 Freestyle Relay:</b> 1, Valley Catholic, 1:48.27. 2, Tillamook, 1:49.77. 3, Newport, 1:52.58.</p> <p><b>100 Backstroke:</b> 1, Megan Sparks, Ast, 1:07.44. 2, Emily Reibach, Til, 1:07.59. 3, Lizeth Cortes, Taft, 1:10.43.</p> <p><b>100 Breaststroke:</b> 1, Kara Putman, Til, 1:11.76. 2, Stefany Alvarez, Scp, 1:19.27. 3, Shelby Kunert, Til, 1:19.39.</p> <p><b>400 Freestyle Relay:</b> 1, Tillamook, 4:06.80. 2, Newport, 4:10.94. 3, Valley Catholic, 4:13.57.</p> <p><b>Boys Team:</b> Newport 304, Seaside 218, Valley Catholic 156, Rainier 128, Tillamook 124, Astoria 97, Taft 93, Scappoose 92, Banks 11.</p> <p><b>200 Medley Relay:</b> 1, Seaside, 1:48.43. 2, Valley Catholic, 1:51.75. 3, Newport, 1:54.27.</p> <p><b>200 Freestyle:</b> 1, David Spurgeon, VC, 1:54.01. 2, Brad Rzewnicki, Sea, 2:00.36. 3, Chandler Arnsdorf, New, 2:04.68.</p> <p><b>200 Individual Medley:</b> 1, Ben Settle, VC, 2:04.19. 2, Raul Carrasco, New, 2:05.25. 3, Arath Hernandez, New, 2:23.44.</p> <p><b>50 Freestyle:</b> 1, Ryland Pampush, Til, 53.21. 2, Sam Beaudoin, Sea, 24.15. 3, Dylan Townsend, Sea, 24.36.</p> <p><b>100 Butterfly:</b> 1, David Spurgeon, VC, 56.92. 2, Austin Thompson, New, 57.93. 3, Justin Delfin, Taft, 1:01.21.</p> <p><b>100 Freestyle:</b> 1, Ryland Pampush, Til, 53.21. 2, Leland Wood, New, 54.15. 3, Sam Beaudoin, Sea, 54.98.</p> <p><b>500 Freestyle:</b> 1, Bryce Nurdin, Ast, 5:36.58. 2, Chance Settle, New, 5:41.87. 3, Ronan Krutzykowsky, New, 5:53.27.</p> <p><b>200 Freestyle Relay:</b> 1, Newport, 1:36.99. 2, Seaside, 1:37.90. 3, Tillamook, 1:40.85.</p> <p><b>100 Backstroke:</b> 1, Ben Settle, VC, 55.22. 2, Raul Carrasco, New, 57.37. 3, Nik Grittith, Rai, 1:01.87.</p> <p><b>100 Breaststroke:</b> 1, Austin Thompson, New, 1:06.19. 2, Chandler Arnsdorf, New, 1:07.22. 3, Brad Rzewnicki, Sea, 1:11.45.</p> <p><b>400 Freestyle Relay:</b> 1, Newport, 3:35.57. 2, Seaside, 3:42.41. 3, Valley Catholic, 3:44.28.</p>
<p><b>BASKETBALL</b></p> <p><b>HIGH SCHOOLS</b></p> <p><b>Boys</b></p> <p><b>Scappoose 54, Astoria 41</b></p> <p><b>SCP (54):</b> Jacob Wendelschafer 14, McNabb 13, C.Johnson 10, Marcantonio 8, Ford 6, Lohman 3.</p> <p><b>AST (41):</b> Fridtjof Fremstad 10, Strange 9, Palek 8, Jarrett 8, Fruith 6, Scroup, Johnson, Keating, Olson, Williams, C.Englund, Loughran, Arnsdorf.</p> <p><b>Scappoose 1411 920—54</b></p> <p><b>Astoria 1011 128—41</b></p> <p><b>Seaside 48, Valley Catholic 33</b></p> <p><b>VC (33):</b> Kazuma Lane 13, Krishnakumar 6, Haggerty 4, Oswald 3, Parthasarathy 3, Jones 2, Menkens 2.</p> <p><b>SEA (48):</b> Jackson Januik 18, Eagon 11, Marston 8, Smith 4, Babb 3, Thompson 2, Lewis 2.</p> <p><b>Valley Catholic 9 7 710—33</b></p> <p><b>Seaside 11 9 1612—48</b></p> <p><b>Knappa 88, Neah-Kah-Nie 38</b></p> <p><b>KNA (88):</b> Tyson Burnard 23, Takalo 22, Weirup 18, Severson 8, J.Miller 6, Goodman 5, Dragoo 3, Parks 2, Rubus 1.</p> <p><b>NKN (38):</b> Garit Champ 16, May 12, Holm 6, Croman 3, Hasenoehrl 1.</p> <p><b>Knappa 2827 249—88</b></p> <p><b>Neah-Kah-Nie 1210 133—38</b></p> <p><b>Falls City 44, Jewell 29</b></p> <p><b>FC (44):</b> Tristan Yeager 15, T.Simmons 11, R.Kempfer 8, N.Kempfer 2, Labrado 2, Larain 2.</p> <p><b>JWL (29):</b> Victor Berg 9, Stahly 8, Ritchie 4, Meehan 4, Murray 2, Silva 2.</p> <p><b>Falls City 9 11 1410—44</b></p> <p><b>Jewell 4 9 412—29</b></p> <p><b>Girls</b></p> <p><b>Scappoose 46, Astoria 41</b></p> <p><b>SCP (46):</b> Alyssa Spang 16, Tinning 13, B.Sykes 6, Kopra 5, Brodala 4, Bailey 2.</p> <p><b>AST (41):</b> Chloee Hunt 14, DeMander 8, DiBartolomeo 6, Wallace 6, Mitchell 5, Abrahams 2, Dalton.</p> <p><b>Scappoose 1210 915—46</b></p> <p><b>Astoria 13 6 1210—41</b></p> <p><b>Valley Catholic 69, Seaside 56</b></p> <p><b>SEA (56):</b> Maddi Utti 16, Dundas 11, Westerholm 11, Villegas 8, Pldeue 6, Bussert 2, West 2.</p> <p><b>V.Catholic 1418 1324—69</b></p> <p><b>Seaside 1618 1111—56</b></p> <p><b>Neah-Kah-Nie 43, Knappa 41</b></p> <p><b>KNA (41):</b> Chloe Little 13, Cameron 8, Wright 8, Rogers 5, Aho 4, Jones 3, Vanderburg, Vandergriff, Landwehr.</p> <p><b>NKN (43):</b> Brittany Scull 13, Holm 10, Romig 9, Swanson 4, Clifford 2, Kelly 2, Lambert 1.</p> <p><b>Knappa 2 9 13 773—41</b></p> <p><b>NKN 7 8 8 875—43</b></p> <p><b>Falls City 28, Jewell 27</b></p> <p><b>FC (28):</b> Vanney 18, Coker 4, Kidd 3, Pdear 2, Ziolo 1.</p> <p><b>JWL (27):</b> Alyscia Littlepage 8, Rachel Stahly 8, Morales 5, Thurston 3, Guillen 2, H.Littlepage 1, Haddock.</p> <p><b>Adna 55, Ilwaco 43</b></p> <p><b>ADNA (55):</b> Rolfe 22, Dotson 12, Elliott 10, Gaffney 6, Gilbertson 3, Callahan 2.</p> <p><b>ILW (43):</b> Makenzie Kaech 23, Coffin 13, Lindstrom 3, Ellsworth 2, McMillan 2, Tapio, Jacobson.</p> <p><b>Adna 1214 1316—55</b></p> <p><b>Ilwaco 8 9 1016—43</b></p> <p><b>Lake Quinalt 47, Naselle 42</b></p> <p><b>LQ (47):</b> Romey Begay 21, S.Thomas 10, E.Silva 7, B.Thomas 6, Blackburn 3.</p> <p><b>NAS (42):</b> Ellie Chapman 20, Leeland 8, T.Eaton 6, Ford 6, Jacot 2, A.Eaton, Footh, Ridgeway.</p> <p><b>Lake Quinalt 15 5 1513—47</b></p> <p><b>Naselle 9 17 97—42</b></p>	<p><b>WRESTLING</b></p> <p><b>HIGH SCHOOLS District 1/4A at Tillamook</b></p> <p><b>Team:</b> Crook County 507.5, Scappoose 235.5, Tillamook 205, Banks 183.5, Gladstone 108.5, Estacada 88, Madras 78, Molalla 59.5, Corbett 57, Astoria 32, Seaside 5.</p>

**WANTED**

**Alder and Maple Saw Logs & Standing Timber**

**Northwest Hardwoods • Longview, WA**

Contact: Steve Axtell • 360-430-0885 or John Anderson • 360-269-2500

*With this sweetheart of a deal, now might be the time to move to Suzanne Elise Assisted Living*

**FEBRUARY SPECIAL**

ONLY **\$14** FOR THE MONTH (plus services)

**\$3000** IN SAVINGS

Call Suzanne for details and a tour **503-738-0307**

**101 FOREST DRIVE SEASIDE**

WWW.SUZANNE-ELISE.COM

Visit us online at [www.DailyAstorian.com](http://www.DailyAstorian.com)

Facebook, Twitter, Pinterest, Instagram, YouTube icons

The Clatsop County Fairgrounds Presents

★ Vehicle Parking is \$3 ★ Kids 5 & Under FREE ★

**ADULT \$15**

**CHILD \$10**

**DOORS** open at 6 p.m.

**SHOW** starts at 6 p.m.

**VS**

**TOUR**

**Saturday February 21st**

**Clatsop County Fairgrounds**

• Fun's • Clatsop Distributing • Astoria Riverwalk Inn • Peterson Tail/Longview

**Saturday February 21st**

**Clatsop County Fairgrounds**

★ Buy your tickets online - [www.tickettomato.com](http://www.tickettomato.com) or at Fullano's Astoria ★