



Rob Hayden/USGS

WERC Study Published in *Nature*: Large Old Trees Grow Fastest, Storing More Carbon

Nate Stephenson, Adrian Das, and Phil van Mantgem joined an international team of scholars in an analysis of 673,046 trees belonging to 403 tree species from tropical, subtropical and temperate regions across six continents, and confirmed that trees do not slow in their growth rate as they get older and larger — instead, their growth keeps accelerating. The study was initiated by Stephenson and Das through the **USGS Western Mountain Initiative** and the **USGS John Wesley Powell Center**.

<http://www.usgs.gov/newsroom/article.asp?ID=3781>
<http://www.werc.usgs.gov/outreach.aspx?RecordID=199>
<http://www.nature.com/news/tree-growth-never-slows-1.14536>
<http://www.theguardian.com/environment/2014/jan/15/trees-grow-more-older-carbon>
<http://www.npr.org/2014/01/16/262479807/old-trees-grow-faster-with-every-year>
<http://dotearth.blogs.nytimes.com/2014/01/15/if-old-humans-grew-like-old-trees-stand-back/>
<http://www.smithsonianmag.com/science-nature/save-big-trees-180949344/>
<http://io9.com/trees-become-more-powerful-and-productive-as-they-age-1502111873>
<http://science.time.com/2014/01/15/study-shows-older-trees-absorb-more-carbon/>
<http://www.agenciasinc.es/Noticias/Los-arboles-viejos-y-grandes-crecen-mas-rapido-y-almacenan-mas-carbono>

NEW JOURNAL ARTICLES

Veblen, KE, DA Pyke, CL Aldridge, ML Casazza, TJ Assal, MA Farinha. 2014. **Monitoring of livestock grazing effects on Bureau of Land Management land.** *Rangeland Ecology & Management* 67:68-77. doi: 10.2111/REM-D-12-00178.1 <http://www.werc.usgs.gov/ProductDetails.aspx?ID=4996>

Troy, RJ, PS Coates, JW Connelly, G Gillette, DJ Delehanty. 2013. **Survival of mountain quail translocated from two distinct source populations.** *The Journal of Wildlife Management* 77(5): 1031-1037. doi: 10.1002/jwmg.549 <http://www.werc.usgs.gov/ProductDetails.aspx?ID=4984>

EVENTS

Dec. 16, 2013 (San Diego, CA)

Amy Vandergast and colleagues organized a **genetics workshop** for the San Diego Management and Monitoring Program, sharing genetic approaches for habitat corridor planning for USFWS, BLM, U.S. Forest Service, The Nature Conservancy, Caltrans and other partners.

<http://www.werc.usgs.gov/Event.aspx?ID=172>

Jan. 27-31, 2014 (Reno, NV)

WERC scientists delivered posters and presentations at **The Wildlife Society's Western Section Annual Meeting**, on topics from habitat connectivity planning to Mohave ground squirrel conservation to desert tortoise translocation.

<http://www.werc.usgs.gov/Event.aspx?ID=171>

Feb. 10-11, 2014 (Sacramento, CA)

All 24 Principle Investigators of WERC gathered at Sacramento headquarters for the **2014 WERC PI Meeting**. Discussions included recent observations on ecological impacts of the current California drought.

Feb. 21-23, 2014 (Ontario, CA)

The **Desert Tortoise Council Annual Symposium** featured research from Kristin Berry, Todd Esque, Ken Nussear, Lisa Lyren, and honored Phil Medica's career.

<http://www.werc.usgs.gov/Event.aspx?ID=173>

IN THE NEWS

Power Line Nests Put US Ravens in Pole Position for Prey (BBC News)

Reporter Matt McGrath reports on the Pete Coates study demonstrating the affinity of common ravens to power transmission structures in the sagebrush ecosystem, a finding with implications for renewable energy and landscape planning.

<http://www.bbc.com/news/science-environment-25656289>

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WERC Center Director Steven Schwarzbach Retires

Steven Schwarzbach, Center Director of the USGS Western Ecological Research Center, has retired from federal service. Best known as an ecologist and an administrator, Schwarzbach's roots were in education, teaching elementary and middle school in the 1980's. His deep passion was science, however, having worked early stints with the U.S. Forest Service and National Park Service. He returned to ecology, receiving his PhD from UC Davis in 1989. Schwarzbach would join the U.S. Fish and Wildlife Service, leading its Environmental Contaminants Program in Sacramento. In 2002, Schwarzbach moved to USGS as a WERC Research Manager, then as Center Director in 2005. With retirement, Schwarzbach will return to science once more, publishing as a USGS Researcher Emeritus and traveling as a skier and outdoorsman. **Keith Miles** will serve as Acting Center Director in the interim. <http://www.werc.usgs.gov/outreach.aspx?RecordID=204>



Honoring California North Coast Geomorphologist Mary Ann Madej

An expert on ecological and geomorphological processes of North Coast rivers, Research Geologist **Mary Ann Madej** retired from the USGS Western Ecological Research Center in 2013, concluding a federal service career spanning 35 years. Madej was among the pioneering fluvial geomorphologist in studying the role of carbon transport in watersheds. Read more: <http://www.werc.usgs.gov/outreach.aspx?RecordID=200>



Longtime UC Davis, USFWS, USGS Ecologist Tom Suchanek Retires

Tom Suchanek has retired from USGS after a productive career as an ecologist, professor, and administrator. Suchanek has left his mark on research in the Washington outer coast, U.S. Virgin Islands, Palmyra Atoll, and Northern California. Suchanek is completing a detail with the USGS Southwest Climate Science Center and will transition to Researcher Emeritus status. <http://www.werc.usgs.gov/outreach.aspx?RecordID=203>



Growing Science in Ag Wetlands: Mercury Science in the Yolo Bypass

In January, eight papers coauthored by USGS were highlighted in a special section of *Science of the Total Environment*. In cooperation with the California State Water Resources Control Board and the California Department of Fish and Wildlife, **Josh Ackerman** and other USGS scientists reported on a 2007 study of rice wetlands in the Yolo Bypass, Calif., comparing methylmercury trends in rice fields versus adjacent non-agricultural wetlands. Ackerman joined project leaders from USGS California Water Science Center and USGS National Research Program to host a briefing session on January 27th to discuss the findings with local stakeholders.

http://www.usgs.gov/blogs/features/usgs_top_story/growing-science-in-agricultural-wetlands/

NEW JOURNAL ARTICLES (CONT'D)

Stephenson, NL, AJ Das, R Condit, SE Russo, PJ Baker, NG Beckman, DA Coomes, ER Lines, WK Morris, N Rüger, E Álvarez, C Blundo, S Bunyavejchewin, G Chuyong, SJ Davies, Á Duque, CN Ewango, O Flores, JF Franklin, HR Grau, Z Hao, ME Harmon, SP Hubbell, D Kenfack, Y Lin, JR Makana, A Malizia, LR Malizia, RJ Pabst, N Pongpattananurak, SH Su, IF Sun, S Tan, D Thomas, **PJ van Mantgem**, X Wang, SK Wiser, MA Zavala. 2014. **Rate of tree carbon accumulation increases continuously with tree size.** *Nature*. doi: 10.1038/nature12914

<http://www.werc.usgs.gov/ProductDetails.aspx?ID=4980>

Lockyear, ZB, DJ Delehanty, **PS Coates**, **ML Casazza**, S Espinosa. 2013. **Greater sage-grouse nest predators in the Virginia Mountains of Northwestern Nevada.** *Journal of Fish and Wildlife Management* 4(2): 242-255. doi: 10.3996/122012-JFWM-110R1

<http://www.werc.usgs.gov/ProductDetails.aspx?ID=4983>

Howe, KB, **PS Coates**, DJ Delehanty. 2014. **Selection of anthropogenic features and vegetation characteristics by nesting common ravens in the sagebrush ecosystem.** *The Condor* 116(1): 35-49. doi: 10.1650/CONDOR-13-115-R2.1

<http://www.werc.usgs.gov/ProductDetails.aspx?ID=4994>

Gillette, GL, **PS Coates**, S Petersen, JP Romero. 2013. **Can reliable sage-grouse lek counts be obtained using aerial infrared technology?** *Journal of Fish and Wildlife Management* 4(2): 386-394. doi: 10.3996/032013-JFWM-025

<http://www.werc.usgs.gov/ProductDetails.aspx?ID=4982>

Fleskes, JP, DA Skalos, MA Farinha. 2013. **Changes in types and area of postharvest flooded fields available to waterbirds in Tulare Basin, California.** *Journal of Fish and Wildlife Management* 4(2):351-361; e1944-687X. doi: 10.3996/022013-JFWM-012

<http://www.werc.usgs.gov/ProductDetails.aspx?ID=4979>

Ervin, EL, KR Beaman, **RN Fisher**. 2013. **Correction of locality records for the endangered arroyo toad (*Anaxyrus californicus*) from the desert region of southern California.** *Bulletin of the Southern California Academy of Sciences* 112(3): 197-205

<http://www.werc.usgs.gov/ProductDetails.aspx?ID=4995>

IN THE NEWS (CONT'D)

There Goes the Neighborhood: Opportunistic Ravens Learn to Use Western Power Lines to Their Benefit (*Idaho State Journal*)

Reporter David Ashby covered the **Pete Coates** study, which found that territorial nesting ravens select power poles and disturbed habitat types for their nest sites.

http://www.idahostatejournal.com/members/there-goes-the-neighborhood-opportunistic-ravens-learn-to-use-western/article_8f7dcd90-8fcf-11e3-9cf6-001a4bcf887a.html

El Patético Destino de la Hormiga Zombi y Otras Historias de Neuroparásitos (Agencias SINC)

Reporter Marta Palomo interviews **Kevin Lafferty** about the mind-altering life histories of brain parasites.

<http://www.agenciasinc.es/Reportajes/El-patetico-destino-de-la-hormiga-zombi-y-otras-historias-de-neuroparasitas>

City Sea Otters Live Better Than Their Country Cousins (*Scientific American*)

Reporter Nsikan Akpan interviews **Tim Tinker** and **Keith Miles** about findings presented to USFWS by USGS and CDFW comparing sea otter health between Big Sur and Monterey Bay waters.

<http://www.scientificamerican.com/article/city-sea-otters-live-better-than-their-country-cousins-slide-show/>

NEW JOURNAL ARTICLES (CONT'D)

Berry, KH, JL Yee, AA Coble, WM Perry, TA Shields. 2013. **Multiple factors affect a population of Agassiz's desert tortoise (*Gopherus agassizii*) in the northwestern Mojave Desert.** *Herpetological Monographs* 27: 87-109.

doi: 10.1655/HERPMONOGRAPHS-D-13-00002

<http://www.werc.usgs.gov/ProductDetails.aspx?ID=4993>

COOPERATOR REPORTS

Vest, JL, WD Smith, D Casey, JP Fleskes, MJ Petrie. 2013. **Farm bill conservation programs can help meet the needs of spring-migrating waterfowl in Southern Oregon-Northeastern California.** CEAP Conservation Insight: Conservation Effects Assessment Project (USDS-NRCS) December 2013.

<http://www.werc.usgs.gov/ProductDetails.aspx?ID=4981>

Esque, TC, KE Nussear, RD Inman, MD Matocq, PJ Weisberg, TE Dilts, P Leitner. (U.S. Geological Survey). 2013. **Habitat Modeling, Landscape Genetics, and Habitat Connectivity for the Mohave Ground Squirrel to Guide Renewable Energy Development.** California Energy Commission. Publication number: CEC-500-2014-003.

<http://www.werc.usgs.gov/ProductDetails.aspx?ID=4991>

WERC PUBLICATION BRIEFS

Predators, denuded patches affect desert tortoise density in the Northwest Mojave Desert: WERC researchers conducted a survey of an isolated population of Agassiz's desert tortoise (*Gopherus agassizii*) living in the southeastern portion of China Lake Naval Air Weapons Station. These animals offered an opportunity to evaluate a tortoise population at a site inaccessible to the public, and to analyze how human and natural variables affect local population trends. The survey results are published in the journal *Herpetological Monographs*, and summarized in this briefing:

<http://www.werc.usgs.gov/ProductDetails.aspx?ID=4992>

Greater sage-grouse space-use models inform surface use designations: Management agencies can assign surface use (SU) designations to reduce negative impacts of planned industrial development, implementing buffer zones of no-activity around greater sage-grouse (*Centrocercus urophasianus*) breeding areas. The rationale for the size of buffers is often challenged, so to clarify this issue, WERC researchers studied space use of greater sage-grouse across seasons to identify the theoretical optimal size of a buffer zone. Their findings are published in *The Journal of Wildlife Management*:

<http://www.werc.usgs.gov/ProductDetails.aspx?ID=4975>

Citizen Scientists Crawl for Climate Change Clues for Survival of Joshua Trees

Reporter Henry Brea reports on research co-led by **Todd Esque** assessing the future range of Joshua trees. With Chris Smith of Willamette University, Esque is studying how two varieties of Joshua trees and their yucca moth pollinator will compete, persist, and disperse northward under future climate change. Esque and Smith will also lead a citizen science course in Tikaboo Valley in March, collecting data and educating volunteers on Joshua tree ecology.

<http://www.reviewjournal.com/news/iconic-mojave-joshua-trees-race-against-extinction>



Las Vegas Review-Journal

U.S. Department of the Interior
U.S. Geological Survey

IN THE NEWS (CONT'D)

CENTRAL VALLEY

WANING WATER FOR WATERBIRDS

BY ROBIN MEADOWS

With less water to go around as California's climate changes, will there still be enough for the 10.12 million waterbirds that winter in the Central Valley each year? With Cal I.C.C. support, Joe Fleskes of the U.S. Geological Survey (USGS) led a team that is helping conservationists make long-term plans for waterbirds that — essentially for the first time — account for climate change.

The Central Valley is one of the biggest draws for waterbirds in North America, attracting 25 waterfowl species, 33 shorebird species, and more than 20 other waterbird species. But only 5% of the state's original wetlands remain. "Water in the Central Valley is nearly much a



Pintails and white-fronted geese in a Central Valley rice paddy. Photo by Joe Fleskes.

Joint Wetland Coordinator agrees. "We are a century into change because of wind and 10 years." "As we realize we have to plan for the long restoration for naught." "The future is now model to in change prep their conservation plan for a don't know

Waning Water for Waterbirds (*Estuary News*)

Reporter Robin Meadows profiles research by **Joe Fleskes** forecasting water supply impacts to waterfowl populations and rice agriculture under climate change. The story also mentions the proposal to create a decision model of the five "F-words" of drought and water in the Central Valley: Farms, Faucets, Fuels, Fish and Fowl.

<http://www.sfestuary.org/wp-content/uploads/2014/03/CALCC-Mar2014-v7x-web.pdf>

FROM THE FIELD

WERC Sub-Station Established at Santa Ana Zoo in Orange County

Adam Backlin, **Liz Gallegos** and the WERC Irvine Sub-Station have relocated to the Santa Ana Zoo. The new address for this branch of the San Diego Field Station is **1801 East Chestnut Avenue, Santa Ana, CA 92701**. The group will continue to focus on Southern California herpetology, as well as future zoo collaborations.



William Chan/USGS

'Nerds for Nature' Test Out Tech Toys at SFBE Field Station in Vallejo

WERC hosted thirty-some passionate biogeeks and hackers on Dec. 8th for a **NatureNerdFest**. Members of the Bay Area group Nerds for Nature gathered on Mare Island to test and share development ideas for research instruments and drones.

<http://www.werc.usgs.gov/outreach.aspx?RecordID=201>