WU-JUNG LEE

Senior Oceanographer, Principal Investigator
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EDUCATION

2013   *Ph.D.*, **MIT-WHOI Joint Program in Oceanography/Applied Ocean Science and Engineering**
Massachusetts Institute of Technology, Cambridge, MA, USA
Woods Hole Oceanographic Institution, Woods Hole, MA, USA
Advisors: Drs. Timothy Stanton, Andone Lavery, Peter Tyack
Thesis: Broadband and statistical characterization of echoes from random scatterers: application to acoustic scattering by marine organisms

2005   *B.S. in Engineering*, **Electrical Engineering**
B.S., **Life Science (with zoology focus) *double major**
National Taiwan University, Taipei, Taiwan

CURRENT AND PAST POSITIONS

2019-   **Senior Oceanographer**, Applied Physics Laboratory, University of Washington
2016-2018   **Research Associate, with Principal Investigator status**, Applied Physics Laboratory, University of Washington
2013-2015   **F.V. Hunt Postdoctoral Fellow**, Department of Psychological and Brain Sciences, Johns Hopkins University (lab relocated from University of Maryland in Spring 2014)
2007-2013   **Graduate student**, Woods Hole Oceanographic Institution
2007   **Research Assistant**, Marine Mammal Research Project, Hawai'i Institute of Marine Biology
2006   **Research Assistant**, Electrophysiology Laboratory, Marine Research Station, Institute of Cellular and Organismic Biology, Academia Sinica, Taiwan
2005   **Intern**, BioSonar Project, Acoustic Research Laboratory, Tropical Marine Science Institute, National University of Singapore
2004-2005   **Research Assistant**, Cetacean Laboratory, Institute of Ecology and Evolutionary Biology, National Taiwan University
2003-2005   **Research Assistant**, Spatial Ecology Laboratory, Institute of Ecology and Evolutionary Biology, National Taiwan University

AFFILIATIONS AND EDITORIAL BOARD

2021-   **Affiliate Assistant Professor**, Department of Electrical and Computer Engineering, University of Washington
2019-   **Affiliate faculty**, University of Washington eScience Institute
2018-   **Faculty**, University of Washington Institute for Neuroengineering (UWIN)
2016-   **Associate Editor**, Journal of the Acoustical Society of America Express Letters (JASA-EL)

PUBLICATIONS

Acoustic Ocean Sensing

Lee WJ, Mayorga E, Setiawan L, Majeed I, Nguyen K, Staneva V. (2021) Echopype: A Python library for interoperable and scalable processing of water column sonar data for biological information. ArXiv:2111.00187. http://arxiv.org/abs/2111.00187

Lee WJ, Staneva V. (2020) Compact representation of temporal processes in echosounder time series via matrix decomposition. *Journal of the Acoustical Society of America*, 148(6): 3429-3442. ****Special issue on Machine Learning in Acoustics.***

Lee WJ, Staneva V. (2019) Tensor decomposition of multi-frequency echosounder time series. *IEEE OCEANS 2019 Seattle*. https://doi.org/10.23919/OCEANS40490.2019.8962566

Lee W-J, Tang D, Stanton TK, Thorsos EI. (2018) Macroscopic observations of diel fish movements around a shallow water artificial reef using a mid-frequency horizontal-looking sonar. *Journal of the Acoustical Society of America*, 144(3), 1424-1434. ***JASA Technical Area Pick of 2018.***

Stanton TK, **Lee W-J**, Baik K. (2018) Echo statistics associated with discrete scatterers: A tutorial on physics-based methods. *Journal of the Acoustical Society of America*, 144(6), 3124-3171. ***Cover of JASA December 2018 issue.***

Lee W-J, Stanton TK. (2016) Statistics of broadband echoes: application to acoustic estimates of numerical density of fish. *IEEE Journal of Oceanic Engineering*, 41(3): 709-723.

Lee W-J, Stanton TK. (2014). Statistics of echoes from mixed assemblages of scatterers with different scattering amplitudes and numerical densities. *IEEE Journal of Oceanic Engineering*, 39(4): 740-754.

Lee W-J, Lavery AC, Stanton TK. (2012). Orientation dependence of broadband acoustic backscattering from live squid. *Journal of the Acoustical Society of America,* 131(6): 4461-4475.

<u>Animal Echolocation</u>

Castellote M, Mooney TA, Andrews R, De Ruiter S, **Lee WJ**, Ferguson M, Wade P. (2021) Beluga whale (*Delphinapterus leucas*) acoustic foraging behavior and applications for long term monitoring. *PLOS ONE*, 16(11), e0260485.

Lee W-J, Falk B, Chiu C, Krishnan A, Arbour JA, Moss CF. (2017) Tongue-driven sonar beam steering by a lingual-echolocating fruit bat. *PLoS Biology*, 15(12): e2003148.

Lee W-J, Moss CF. (2016) Can the elongated hindwing tails of fluttering moths serve as false sonar targets to divert bat attacks? *Journal of the Acoustical Society of America,* 139(5): 2579-2588.

Warnecke M, **Lee W-J**, Krishnan A, Moss CF. (2016) Dynamic echo information guides flight in the big brown bat. *Frontiers in Behavioral Neuroscience,* 10:81.

Danilovich S, Krishnan A, **Lee W-J**, Borrisov I, Eitan O, Kosa G, Moss CF, Yovel Y. (2015) Bats regulate biosonar based on the availability of visual information. *Current Biology*, 25(23): R1124-R1125.

Au WWL, Houser DS, Finneran JJ, **Lee W-J**, Talmadge LA, Moore PW. (2010). The acoustic field on the forehead of echolocating Atlantic bottlenose dolphins (*Tursiops truncatus*). *Journal of the Acoustical Society of America*, 128(3), 1426-1434.

Mooney TA, **Lee W-J**, Hanlon RT. (2010). Long-duration anesthetization of squid (*Doryteuthis pealeii*). *Marine and Freshwater Behaviour and Physiology*, 43(4), 297-303.

MANUSCRIPTS IN PREPARATION

Lee W-J, Ladegaard M, Buck JR, Madsen PT, Beedholm K, Tyack PL. Is broad angular coverage necessary for echolocation-based discrimination involving aspect-dependent targets? *In preparation; draft figures available upon request.*

Lee W-J, Buck JR, Tyack PL. Modeling echolocation as an information-guided active sensing behavior. *In preparation; draft figures available upon request.*

GRANTS AND CONTRACTS

<u>Research</u>   ($ home institution component)

- **NOAA Fisheries, 2021-2023**
  Principal Investigator   ($700,000)
  "Accelerating information extraction from fisheries acoustic data through a cloud-based machine learning workflow."
  Collaborators: Valentina Staneva, Emilio Mayorga, University of Washington

- **Office of Naval Research, Multidisciplinary University Research Initiatives (MURI), 2021-2023**
  Co-Principal Investigator   ($453,784)
  "Specialization of neural processing during active acoustic sensing in marine mammals and humans."
  Collaborators: Barbara C. Shinn-Cunningham, Carnegie Mellon University; Peter L. Tyack, University of St. Andrews; John B. Buck, University of Massachusetts, Dartmouth; Kenneth Shorter, University of Michigan

- **NOAA Office of Ocean Exploration and Research, 2021-2023**
  Principal Investigator   ($340,227)

"Accelerating ocean exploration through cloud-native processing of active ocean sonar data."
Collaborators: Valentina Staneva, Emilio Mayorga, University of Washington

- **NOAA Office of Ocean Exploration and Research, 2020-2022**
  Principal Investigator   ($412,200)
  "Coordinated simultaneous physical-biological sampling by ADCP-equipped ocean gliders"
  Collaborators: Sarah Webster, Aleksandr Aravkin, University of Washington;
          Dezhang Chu, NOAA Northwest Fisheries Science Center

- **National Science Foundation, Division of Ocean Sciences, 2019-2021**
  Principal Investigator   ($281,608)
  "EAGER: Developing a temporally adaptive decomposition framework for analyzing long-term echosounder time series."
  Collaborator: Valentina Staneva, University of Washington

- **Office of Naval Research, Multidisciplinary University Research Initiatives (MURI), 2018-2021**
  Co-Principal Investigator   ($403,000)
  "MURI: Active sensing in echolocating humans and marine mammals."
  Collaborators: Barbara C. Shinn-Cunningham, Carnegie Mellon University; Peter L. Tyack, University of St.
          Andrews; John B. Buck, University of Massachusetts, Dartmouth; Kenneth Shorter, University
          of Michigan

- **NOAA Fisheries, Advanced Sampling Technology Work Group, 2018-2020**
  Co-Principal Investigator   ($84,193)
  "Broadband acoustic species identification and enumeration using trans-dimensional Bayesian inversion."
  Collaborators: Dezhang Chu, Northwest Fisheries Science Center; Stan Dosso, University of Victoria

Education

- **National Science Foundation, Division of Ocean Sciences, 2020-2022**
  Co-Principal Investigator   ($42,487)
  "Collaborative Conference: OceanHackWeek: A Workshop to Explore Data Science in Oceanography"
  Collaborators: Emilio Mayorga, University of Washington;
          Nick Records, Catherine Mitchell, Bigelow Laboratory for Ocean Sciences

- **National Science Foundation, Division of Ocean Sciences, 2019**
  Principal Investigator   ($49,967)
  "Oceanhackweek: A Workshop to Explore Data Science in Oceanography."
  Collaborators: Valentina Staneva, Amanda Tan, University of Washington

- **Consortium of Ocean Leadership, 2018**
  Lead organizer   ($109,265)
  "Oceanhackweek 2018: A hands-on, community-driven workshop on ocean observatory data science."
  Collaborators: Robert Fatland, Amanda Tan, Valentina Staneva, Friedrich Knuth, Landung Satiewan, Aaron
          Marburg, University of Washington

INVITED TALKS

Keynote Lecture (video), the 182nd Meeting of the Acoustical Society of America, Denver, CO. May 23, 2022.
University of Washington Data Science Seminar, University of Washington, October 5, 2021.
Marine Biology Seminar Series, University of Washington, April 26, 2021.
Mathematics Colloquium, Calvin University, October 29, 2020.
School of Aquatic and Fishery Sciences Quantitative Seminar, University of Washington. November 1, 2019.
Department of Electrical and Computer Engineering, Univ of Massachusetts Dartmouth. September 27, 2019.
Wildlife Sciences Seminar, University of Washington, May 7, 2018.
Department of Electrical and Computer Engineering, Dalhousie University. April 6, 2017.
Institute of Cellular and Organismic Biology, Academia Sinica, Taiwan. December 12, 2016.
School of Earth and Ocean Sciences, University of Victoria, BC, Canada. September 13, 2016.
Applied Physics Laboratory, University of Washington, Seattle, WA. September 1, 2015.
Hatfield Marine Station, Oregon State University, Corvallis, OR. July 7, 2015.

Department of Mechanical Engineering, University of New Hampshire, Durham, NH. June 1, 2015.
Spring 2015 Meeting of the Acoustical Society of America, Pittsburgh, PA. May 18, 2015.
Endemic Species Research Institute, Council of Agriculture, Executive Yuan. Nantou, Taiwan. April 20, 2015.
Spring 2014 Meeting of the Acoustical Society of America, Providence, RI. May 5, 2015.
Department of Engineering Science and Ocean Engineering, National Taiwan University. May 1, 2013.
Institute of Oceanography, National Taiwan University, Taipei, Taiwan. January 6, 2010; January 12, 2012.

SELECTED CONFERENCE PRESENTATIONS

Acoustic Ocean Sensing

Lee W-J, Nguyen K, Staneva S. (2020) Echopype: Interoperable and scalable processing of ocean sonar data. *Ocean Sciences Meeting 2020*, San Diego, CA, USA, February 16-21, 2020.

Lee W-J, Chu D, Dosso S. (2019) How much more informative are broadband compared to narrowband echoes for biological interpretation? *The 178th Meeting of the Acoustical Society of America*, San Diego, CA, USA, December 2-6, 2019.

Lee W-J, Staneva V. (2019) Tensor decomposition of multi-frequency echosounder time series. *IEEE OCEANS 2019 Seattle*, Seattle, WA, USA, October 28-31, 2019. DOI: 10.23919/OCEANS40490.2019.8962566.

Lee W-J, Staneva V. (2019) Echopype: Enhancing the interoperability and scalability of ocean sonar data processing for biological information. *SciPy 2019 (Scientific Computing with Python)*. Austin, TX, USA, July 8-14, 2019.

Lee W-J, Staneva V. (2018) Exploring matrix and tensor factorization for discovering latent structures in large echosounder datasets. *The 176th Meeting of the Acoustical Society of America and the 2018 Acoustics Week in Canada*. Victoria, BC, Canada, November 5-9, 2018.

Lee W-J, Staneva V, Herman B, Aravkin A. (2018) Data-driven decomposition of ocean observatory echosounder time series for ecological insights. *The 2018 Ocean Sciences Meeting*, Portland, OR, USA, February 11-16, 2018.

Lee W-J, Tang D, Thorsos EI, Stanton TK. (2016) Mid-frequency clutter and reverberation characteristics of fish in a shallow ocean waveguide. *The 5th Joint Meeting of the Acoustical Society of America and the Acoustical Society of Japan*, Honolulu, HI, USA, November 28-December 2, 2016.

Lee W-J, Stanton TK. (2014). Accounting for the non-Rayleigh echo statistics of individual elongated scatterers in an aggregation. *The 167th Meeting of the Acoustical Society of America*, Providence, RI, USA, May 5-9, 2014.

Lee W-J, Stanton TK, Lavery AC. (2012). Estimating numerical density of scatterers in monotype aggregations using the statistics of broadband echoes: applications to fish echoes. *The 164th Meeting of the Acoustical Society of America*, Kansas City, MO, USA, October 22-26, 2012.

Ross T, **Lee W-J**, Keister JE, Lara-Lopez A, Greene C. (2012). Broadband acoustics on the VENUS observatory in Saanich Inlet. *The 2012 Ocean Sciences Meeting*, Salt Lake City, UT, USA, February 20-24, 2012.

Lavery AC, Geyer WR, Scully ME, Lawson GK, Wiebe PH, **Lee W-J**, Stanton T K, Fincke JR. (2012). Development of high-frequency broadband acoustic scattering techniques for imaging, classification, and quantification of stratified turbulence and zooplankton. *The 2012 Ocean Sciences Meeting*, Salt Lake City, UT, USA, February 20-24, 2012.

Lee W-J, Stanton TK. (2011). Statistics of echoes from mixed assemblages of scatterers with different scattering strengths and numerical densities. *The 162th Meeting of the Acoustical Society of America*, San Diego, CA, USA, October 31-November 4, 2011.

Lee W-J, Stanton TK. (2010). Analysis of mixed assemblages of fish using the statistics of echoes from a single beam broadband echosounder. *The 2nd Pan-American/Iberian Meeting on Acoustics*, Cancun, Mexico, November 15-19, 2010.

Lee W-J, Lavery AC, Stanton TK. (2010). Interpretation of the compressed pulse output for broadband acoustic scattering from inhomogeneous weakly scattering objects. *The 2nd Pan-American/Iberian Meeting on Acoustics*, Cancun, Mexico, November 15-19, 2010.

Lee W-J, Lavery AC, Stanton TK. (2009). Broadband acoustic scattering from squid: implications for toothed-whale foraging. *The 5th Animal Sonar Symposium*, Kyoto, Japan, September 14-18, 2009.

Lee W-J, Stanton TK, Lavery AC. (2009). Broadband acoustic backscattering from live squid: Experiment and analysis. *The 157th Meeting of the Acoustical Society of America*, Portland, OR, USA, May 18-22 2009.

Animal Echolocation and Bioacoustics

Lee W-J, Ladegaard M, Buck JR, Madsen PT, Beedholm K, Tyack PL. Is broad angular coverage necessary for echolocation-based discrimination involving aspect-dependent targets? *The 182nd Meeting of the Acoustical Society of America*, Denver, CO, USA, May 23-27, 2022.

Lee W-J, Buck JR, Tyack, PL, Shinn-Cunningham B. (2019) Active infotaxis as a model for echolocation. *The 178th Meeting of the Acoustical Society of America*, San Diego, CA, USA, December 2-6, 2019.

Lee W-J (2017) I wonder how animals can do it so well: An ongoing detour to build better sonar, enabled by the Hunt fellowship. *The 174th Meeting of the Acoustical Society of America*, New Orleans, LA, USA, December 4-8, 2017.

Lee W-J, Yu H-Y, Au WWL, Smith A, Jen IF, Yang WC, Fan YC, Nachtigall PE, Chou L-S. (2016) Biosonar radiation field on the forehead of a Risso's dolphin during prey capture. *The 5th Joint Meeting of the Acoustical Society of America and the Acoustical Society of Japan*, Honolulu, HI, USA, November 28- December 2, 2016.

Lee W-J, Falk B, Chiu C, Krishnan A, Moss CF. (2016) Asymmetric multi-frequency biosonar beam pattern of tongue-clicking bat, *Rousettus aegyptiacus*. *The 171th Meeting of the Acoustical Society of America*, Salt Lake City, UT, USA, May 23-27, 2016.

Lee W-J, Moss CF. (2015). Detection and tracking of fluttering moths by echolocating bats. *The 169th Meeting of the Acoustical Society of America*, Pittsburgh, PA, USA, May 18-22, 2015.

Krishnan A, **Lee W-J**, Moss CF. (2014). Use of multisensory information by flying bats. Presented at *the 2014 Annual meeting of the Society for Neuroscience*, Washington, D.C., USA, November 15-19, 2014.

Lee W-J, Sändig S, Denzinger A, Schnitzler H-U, Horiuchi TK, Moss CF. (2014). Reconstructing the acoustic scenes encountered by free-flying, foraging bats. *The 167th Meeting of the Acoustical Society of America*. Providence, RI, USA, May 5-9, 2014.

Lee W-J, Sayigh LS, Jensen FJ, Tyack PL. (2011). Tonal whistles or burst pulses? Linking potential sound production mechanisms to the classification of toothed whale sounds. *The 19th Biennial Conference on the Biology of Marine Mammals*, Tampa, FL, USA, November 27-December 2, 2011.

Lee W-J, Yu H-Y, Chou L-S. (2005). Vocalization repertoire of the three strayed rough-toothed dolphins (*Steno bredanensis*) in Danshui River, Taipei, Taiwan. *The 16th Biennial Conference on the Biology of Marine Mammals*, San Diego, CA, USA, December 12-16 2005.

Lee P-F, **Lee W-J**, Chen Y-A, Yeh C-C, Chou L-S. (2005). Distribution of cetaceans in the waters off eastern Taiwan. *The 16th Biennial Conference on the Biology of Marine Mammals*, San Diego, CA, USA, December 12-16 2005.

Lee W-J, Tsai P-Y, Chen Y-H, Chou L-S. (2005). Exploration of the behavior and movement patterns of spinner dolphins in North Ilan waters. *The 8th Animal Behavior and Ecology Conference*, Taiwan.

HONORS AND AWARDS

- SEED Postdoctoral Fellowship, Applied Physics Laboratory, University of Washington (2016-2017)
- Frederick V. Hunt Postdoctoral Fellowship in Acoustics, the Acoustical Society of America (2014-2015)
- Best student papers in Acoustical Oceanography (ASA 157th, 2009; ASA164th, 2012), Underwater Acoustics (ASA 160th, 2010)
- Awards for Outstanding Poster Presentations, the 5th Animal Sonar Symposium, Kyoto, Japan (2009)
- Taiwan Merit Scholarships, jointly supported by Taiwan's Ministry of Education, Council for Economic Planning and Development, and National Science Council in Taiwan (2007-2009)

FIELD EXPERIENCES

- Simultaneous physical-biological sampling by an ADCP-equipped ocean glider. August 27-September 15, 2021. Chief Scientist.
- VISIONS'17; VISIONS'18: Ocean Observatories Initiative (OOI) Cabled Array maintenance cruises. August 20-27, 2017; July 19-August 5, 2018.

- NOAA Northwest Fisheries Science Center 2017 hake acoustic-trawl survey. July 23-August 7, 2017
- Zooplankton patchiness and ecosystem dynamics at the shelf break, led by Dr. Gareth Lawson. September 21-30, 2010 and October 26-November 6, 2010.
- Broadband acoustic studies of fish in Georges Bank and the Gulf of Maine, led by Dr. Timothy Stanton. September 8-18, 2010.
- Behavioral observation and visual survey of marine mammals in the waters off Taiwan. 2003-2006.

MENTORING

- YeonJoon Cheong, Postdoctoral Scholar, Applied Physics Laboratory, UW (July 2022-present)
- Zhongqi Miao, Postdoctoral Scholar, Applied Physics Laboratory, UW (March 2022-present)
- Brandon Reyes, Research Software Engineer, Applied Physics Laboratory, UW (January 2022-present)
- Landung "Don" Setiawan, Research Software Engineer, School of Oceanography, UW (January 2021-present)
- Derya Gumustel, Post-Baccalaureate Researcher, School of Oceanography, UW (June 2021-February 2022)
- Kavin Nguyen, Post-Baccalaureate Researcher, Department of Physics, UW (June 2020-June 2021)
- Mentored 10 undergraduate students from the Departments of Electrical and Computer Engineering, Department of Physics, Department of Biology at UW since 2017.
- Mentored 3 undergraduate students from the Behavioral Biology Program at Johns Hopkins University in 2014-2015

SYNERGISTIC ACTIVITIES

- *Open-source development of community software.* Created the open-source Python software package, Echopype (https://github.com/OSOceanAcoustics/echopype), to enable interoperable and scalable processing of ocean sonar data for biological information. Since its first release in 2019, Echopype has been used widely by scientists in the international ocean and fisheries acoustics communities. The NSF Ocean Observatories Initiative (OOI) Data Center has adopted Echopype to parse and serve echosounder data from the network. The NOAA National Centers for Environmental Information is also using Echopype as the data ingestion backend for interactive visualization on the Cloud. The Echopype GitHub repository has become an open forum for community discussion.

- *Organization of community-building workshops.* Found, lead and co-lead the organization of OceanHackWeek (OHW, https://oceanhackweek.github.io/) from 2018 to present. OHW is an intensive, interactive workshop focused on educating ocean scientists with modern data science skills and building an inclusive and cohesive community. The organization of OHW itself is also a collaborative process, with members of the organizing committee spanning multiple US and international institutions with expertise in all oceanography subdomains. Since 2018, OHW has engaged more than 220 US and international participants, who jointly contributed to 41 collaborative "hack projects" hosted on the OHW GitHub organization (https://github.com/oceanhackweek). Have been co-organizer and lecturer for multiple workshops on bioacoustics and software best practices in collaboration with Taiwan's National Museum of Natural Science.

- *Service to community and community infrastructure.* Have been a Subject Matter Expert for the NSF Ocean Observatories Initiative (OOI) Bio-acoustic sonar since 2018. Advised data collection issues and instrument maintenance decisions. Have been member of the Technical Committees in Acoustical Oceanography (TCAO, since 2014) and Animal Bioacoustics (TCAB, since 2015) of the Acoustical Society of America since 2016.

- *Editorial service.* Have been an Associate Editor for the Journal of the Acoustical Society of America Express Letter (JASA-EL) since 2016. Have been reviewers for JASA, JASA-EL, Proceedings of the National Academy of Science, Limnology and Oceanography: Method, IEEE Journal of Oceanic Engineering, Scientific Reports, Fisheries Research, ICES Journal of Marine Science, Frontiers in Behavioral Neuroscience, Animal Behaviour, PLOS ONE, and Journal of Marine Science and Technology.

- *Service and mentoring to increase diversity and inclusion in science.* Have been member of the APL Diversity, Equity, and Inclusion committee since 2020 and the Acoustics department representative since 2021. Have mentored 8 undergraduate students, 1 post- baccalaureate researcher, 1 postdoctoral researcher, and 2

professional staff (4 women, 3 Asian American, 1 Hispanic American, 1 Pacific Islander American, 2 first-generation to college).

- *Other outreach activities*. Have served broadly in education and outreach programs during college to promote awareness of marine mammals and marine ecosystem health in Taiwan, including serving as a trainer for marine mammal visual observer and stranding response in the Cetacean Lab, Institute of Ecology and Evolutionary Biology, National Taiwan University (2003-2006), a lecturer for marine mammal biology for elementary school outreach program for the Taiwan Cetacean Society (2002-2006), and a wildlife and geology interpreter on whale-watching boats off the east coast of Taiwan (2001-2003).

PRESS

- [Ocean exploration features: Sampling using ADCP-equipped gliders.](#) NOAA Ocean Exploration. August-September, 2021.
- [A bountiful sea of data: Making echosounder data more useful](#). Ocean Observatories Initiative (OOI). April 1, 2021.
- [Echolocation is nature's built-in sonar. Here's how it works](#). National Geographic. February 3, 2021.
- [Big data and fisheries acoustics](#). International Council for the Exploration of the Sea (ICES) September 15, 2020.
- [Wu-Jung Lee's journey into ocean sound from dolphins to bats and back to the sea.](#) Ocean Observatories Initiative. August 8, 2018.
- [Fruit bat's locating clicks echo sophisticated radar.](#) Reuters | Video – Technology, April 22, 2018.
- [Navigating with the tongue, the Egyptian fruit bat way!](#) Research Matters, April 3, 2018.
- [Phased arrays & the Egyptian fruit bat.](#) Lab Animal Magazine, February 2018.
- [Fruit bat's echolocation may work like sophisticated surveillance sonar.](#) UW Today, February 6, 2018.
- [Luna moth's long tail could confuse bat sonar through its twist.](#) UW Today, August 15, 2016.
- [The Squid, the Whale, and the Grad Student – A young scientist deciphers meaning embedded in sonar signals](#). Oceanus Magazine, 2009.