# Professional Preparation and Academic and Professional Appointments

# 2007, Ph.D., Ecology and Evolutionary Biology, Cornell University; Ecological and evolutionary characteristics of flight ­calls of Wood­-warblers (Parulidae)

# 2001, M. S., Zoology, Clemson University; The Density of Nocturnal Bird Migration: a comparison of Doppler radar and acoustic measures

# 1995, B.S., Natural Resources, Cornell University

# 2014-present: Elective Board Member, American Ornithologists’ Union.

# 2012-present: Research Associate, Information Science, Cornell Lab of Ornithology

# 2010-2012: Research Associate, Conservation Science, Cornell Lab of Ornithology

# 2010-2015: Board, New York City Audubon

# 2010-present: Faculty Fellow, Atkinson Center for a Sustainable Future, Cornell University.

# 2009-2014: Board, Fundación de Conservación Jocotoco (Ecuador)

# 2007-2010: Postdoctoral Research Associate, Conservation Science, Cornell Lab of Ornithology

# 2006-2012: Association of Field Ornithologists, Council member

# 2006-2012: Research Associate, Powdermill Avian Research Center

# 2002-2006: Teaching and Research Assistant. Cornell University

# 2001-2002: Audubon Science Fellow, National Audubon Society, New York, NY

# 1999-2001: Research Assistant, Radar Ornithology Laboratory, Clemson University

# 1995-2008: Tour Leader, Victor Emanuel Nature Tours, Inc., Austin, TX

# 1994-1995: Teaching Assistant, Cornell University

**Areas of Expertise (Keywords):** aeroecology, radar ornithology, migration ecology, artificial light, remote sensing, climate change, phenology, animal behavior, bioacoustics, meteorology, machine learning

**Graduate and Postdoctoral Mentors:** Dr. S.A. Gauthreaux, Jr., (MS, 2001); Dr. John W. Fitzpatrick, (Ph.D., 2007); Dr. Kenneth V. Rosenberg, (Postdoctoral; 2010)

# Service and Memberships: American Ornithological, Wilson Ornithological, and Cooper Ornithological Societies, Association of Field Ornithologists, AAAS, AGU, American Society of Naturalists, Ecological Society of America.

*- Committees***:** Assessing Risks and Impacts to Migrating Birds from Wind Energy; Fundación de Conservación Jocotoco; NYC Audubon; Cornell Migrations Taskforce

# *- Collaborative Teams:* PI and co-PI, NSF, Belmont Forum, National Fish and Wildlife Foundation, European Network for the Radar surveillance of Animal Movement, DoD, DoI, NYSERDA and BOEM with Oregon State University, University of Massachusetts Amherst, New York University, Rice University, Swiss Ornithological Institute, Cape May Bird Observatory among others

*- Review*: 256 manuscripts since 2011 including the following peer-reviewed journal -- Ibis (Associate Editor), Ornithological Advances/Applications, Biometeorology, The Wilson Journal of Ornithology, The Journal of Field Ornithology, Ecological Applications, Ecological Modeling, Ecology Letters, Nature Ecology & Evolution, Science Advances, Bioacoustics, Ardea, PloS One, Avian Biology Research

*- Outreach*: Regular presentations and appearances for public; and to media (appendix)

*- Mentoring*: elementary (8), high school (6), undergraduate (10), graduate (5), and postdoctoral (4) research through Eastchester, White Plains, Pelham, and, LaGuardia High Schools, Marymount science mentoring programs, STSS, Cornell, Columbia, Oklahoma, Oxford, Towson, and Fordham Universities

*- Teaching*: Migration Ecology, Columbia (2010, 2011, 2014, 2019), Sound Analysis Workshop, Cornell University (2008-present), MIGRATE 2008 (NSF-DIOS 0541740), Young Birders’ Event (2009-present)

**Selected Refereed Publications (2017-2019):** [**Cornell Research Page**](file:///Users/andrew/Box%20Sync/Farnsworth%20Lab%20Documents%20and%20PDs/SRA/Cornell%20Research%20Page)[**Google Scholar**](https://scholar.google.com/citations?hl=en&user=ipk79FsAAAAJ&view_op=list_works&sortby=pubdate)[**Researchgate**](https://www.researchgate.net/profile/Andrew_Farnsworth)

* Horton, K.G., La Sorte, F.A., Sheldon, D., Lin, T., Winner, K., Bernstein, G., Maji, S., Hochachka, W. M., Farnsworth, A. 2019. Phenology of nocturnal avian migration has shifted at the continental scale. *Nature Climate Change* doi:10.1038/s41558-019-0648-9
* Newcombe, Patrick B., Cecilia Nilsson, Tsung-Yu Lin, Kevin Winner, Garrett Bernstein, Subhransu Maji, Daniel Sheldon, Andrew Farnsworth, and Kyle G. Horton. "Migratory flight on the Pacific Flyway: strategies and tendencies of wind drift compensation." *Biology letters* 15, no. 9 (2019): 20190383.
* Gomes, C., Dietterich, T., Barrett, C., Conrad, J., Dilkina, B., Ermon, S., Fang, F., Farnsworth, A., Fern, A., Fern, X. and Fink, D., 2019. Computational sustainability: Computing for a better world and a sustainable future. *Communications of the ACM*, *62*(9), pp.56-65.
* Lin, T.Y., Winner, K., Bernstein, G., Mittal, A., Dokter, A.M., Horton, K.G., Nilsson, C., Van Doren, B.M., Farnsworth, A., La Sorte, F.A. and Maji, S., 2019. MistNet: Measuring historical bird migration in the us using archived weather radar data and convolutional neural networks. *Methods in Ecology and Evolution*.
* Winger, BM, Weeks, BC, Farnsworth, A, Jones, AW, Hennen, M, Willard, DE. 2019 Nocturnal flight-calling behaviour predicts vulnerability to artificial light in migratory birds. Proc. R. Soc. B 286: 20190364. http://dx.doi.org/10.1098/rspb.2019.0364
* Horton, K. G., Nilsson, C., Van Doren, B. M., La Sorte, F. A., Dokter, A. M. and Farnsworth, A. 2019. Bright lights in the big cities: migratory birds’ exposure to artificial light. Front Ecol Environ. doi:[10.1002/fee.2029](https://doi.org/10.1002/fee.2029)
* Horton, K.G., Van Doren, B.M., La Sorte, F.A., Cohen, E.B., Clipp, H.L., Buler, J.J., Fink, D., Kelly, J.F. and Farnsworth, A., 2019. Holding steady: Little change in intensity or timing of bird migration over the Gulf of Mexico. Global Change Biology. <https://doi.org/10.1111/gcb.14540>. [Altmetrics Score](https://wiley.altmetric.com/details/58275104#score).
* Lostanlen, V., Salamon, J., Cartwright, M., McFee, B., Farnsworth, A., Kelling, S. and Bello, J.P., 2019. Per-Channel Energy Normalization: Why and How. IEEE Signal Processing Letters, 26(1), pp.39-43.
* Nilsson, C., Horton, K.G., Dokter, A.M., Van Doren, B.M. and Farnsworth, A., 2018. Aeroecology of a solar eclipse. Biology letters, 14(11), p.20180485.
* Bauer, S., Shamoun-Baranes, J., Nilsson, C., Farnsworth, A., Kelly, J.F., Reynolds, D.R., Dokter, A.M., Krauel, J.F., Petterson, L.B., Horton, K.G. and Chapman, J.W., 2018. The grand challenges of migration ecology that radar aeroecology can help answer. Ecography, 42, pp.1-15.
* Dokter, A. M., A. Farnsworth, D. Fink, V. Ruiz-Gutierrez, W. M. Hochachka, F. A. La Sorte, O. J. Robinson, K. V. Rosenberg, and S. Kelling. 2018. Seasonal abundance and survival of North America’s migratory avifauna determined by weather radar. Nature Ecology & Evolution 2:1603–1609.
* Horton, K. G., B. M. Van Doren, F. A. La Sorte, D. Fink, D. Sheldon, A. Farnsworth, and J. F. Kelly. 2018. Navigating north: how body mass and winds shape avian flight behaviours across a North American migratory flyway. Ecology letters 21 (7): 1055-1064.
* Van Doren, B.M., Horton, K.G., Dokter, A.M., Klinck, H., Elbin, S.B. and Farnsworth, A., 2017. High intensity urban light installation dramatically alters nocturnal bird migration. Proceedings of the National Academy of Sciences, 114(42), pp.11175-11180. [Altmetrics Score](https://pnas.altmetric.com/details/26927850).

**Additional Refereed publications (2017-2019)**

1. Lostanlen, V., et al. *Birdvox-full-night: A dataset and benchmark for avian flight call detection*. 2018.

2. Lisovski, S., et al., *Inherent limits of light-level geolocation may lead to over-interpretation.* Current Biology, 2018. 28(3): p. R99-R100.

3. Dokter, A.M., et al., *bioRad: biological analysis and visualization of weather radar data.* Ecography, 2018. 0(ja).

4. Sullivan, B.L., et al., *Using open access observational data for conservation action: a case study for birds.* Biological Conservation, 2017. 208: p. 5-14.

5. Salamon, J., et al. *Fusing shallow and deep learning for bioacoustic bird species classification*. in *Acoustics, Speech and Signal Processing (ICASSP), 2017 IEEE International Conference on*. 2017. IEEE.

6. La Sorte, F.A., et al., *Seasonal associations with urban light pollution for nocturnally migrating bird populations.* Global Change Biology, 2017.

7. Cohen, E.B., et al., *How do en route events around the Gulf of Mexico influence migratory landbird populations?* The Condor, 2017. **119**(2): p. 327-343.

**Moderated Symposia and Workshops (2017-2019)**

* Farnsworth, A. 2019. Radar ornithology and a vision for the future of migration research. 11 January 2019, Rice University, Houston, TX.
* Farnsworth, A. 2018. Macro-Aeroecology: Characterizing Animal Ecology and Behavior in the Atmosphere from Local to Continental Scales. SS 13, Ecological Society of America, New Orleans LA, 5-10 August 2018.

**Invited Talks (2017-2019)**

* Farnsworth, A. 2019. Radar ornithology and a vision for the future of migration research. 11 January, Rice University, Houston, TX.
* Farnsworth, A. 2017. Sustainability Town Hall with Gale Brewer, Assemblywoman Deborah Glick. 28 November, New School, NY, NY.
* Farnsworth, A. 2017. Tracking forward: Bird migration in the age of big data and observation. IBOC-II, International Bird Observatory Conference, Cape May, NJ, 26-30 October. Keynote.
* Farnsworth, A. 2017. High intensity lights and their effects on behaviors of nocturnally migrating birds. 3 October, Swiss Ornithological Institute, Sempach, Switzerland.
* Farnsworth, A. 2017. Perspectives on nocturnal bird migration: what we've learned from BirdCast. 6 March, Monday Night Seminar Series, Cornell Lab of Ornithology.

**Popular Press and Performance (2017-2019)**

2019 (see Horton et al. 2019 Altmetrics)

* [Artificial light makes birds fly into buildings at night](https://www.futurity.org/birds-migration-artificial-light-collisions-2028542/), 5 April 2019.
* [Fatal chirps: Nocturnal flight calls increase building collisions among migrating birds](https://news.umich.edu/fatal-chirps-nocturnal-flight-calls-increase-building-collisions-among-migrating-birds/), 2 April 2019
* [Chicago tops list of most dangerous cities for migrating birds](http://news.cornell.edu/stories/2019/04/chicago-tops-list-most-dangerous-cities-migrating-birds), 1 April 2019

2018

* [Kill the lights to help save migrating birds. October 16, 2018.](https://www.houstonchronicle.com/neighborhood/memorial/events/article/Kill-the-lights-to-help-save-migrating-birds-13308825.php)
* [Migraciones de Aves Analizadas por Radar (Migrations of Birds Analyzed by Radar), tiempo.com (Spain), October 10, 2018](https://www.tiempo.com/ram/465381/migraciones-de-aves-analizadas-por-radar/)
* [Kill the Lights, Save the Birds, Montgomery County News (TX), October 10, 2018](http://montgomerycountynews.net/kill-the-lights-save-the-birds-p6338-106.htm)
* [Billions of Birds Fly South Every Fall, Billings Gazette, October 3, 2018](https://billingsgazette.com/lifestyles/recreation/just-for-kids/billions-of-birds-fly-south-every-fall/article_2a9dec9b-80c0-567a-9735-c82b708de645.html)
* [Billions of Birds Fly South Every Fall, *Elko Free Daily Press* (NV), October 3, 2018](https://elkodaily.com/lifestyles/recreation/just-for-kids/billions-of-birds-fly-south-every-fall/article_d4a7d6b8-d72d-581a-a4fd-bb7d387e53b5.html)
* [Billions of Birds Fly South Every Fall , Daily Journal online (MO), October 3, 2018](https://dailyjournalonline.com/lifestyles/recreation/just-for-kids/billions-of-birds-fly-south-every-fall/article_43fb74b7-32a2-5074-b3db-58d81ddc95ca.html)
* [Cities Say “Lights Out” to help Migrating Birds, Mother Nature Network, September 24, 2018](https://www.mnn.com/earth-matters/animals/blogs/cities-across-country-say-lights-out-help-migrating-birds)
* [Birds Flying South. How Many Will Return? EarthSky, September 23, 2018](http://earthsky.org/earth/study-shows-low-return-rate-for-bird-wintering-in-us)
* [Andrew Farnsworth–the Cornell Lab of Ornithology-Night Bird Migration, WPKN Community Radio podcast (CT), September 19, 2018](https://soundcloud.com/wpkn895/andrew-farnsworth_cornell-ornithology_night-bird-migration)
* [How Houston Can Help Migratory Birds, Houston Chronicle, September 18, 2018](https://www.houstonchronicle.com/local/gray-matters/article/houston-light-pollution-buildings-migratory-birds-13238820.php)
* [More Than 4 Billion Birds Stream Overhead During Fall Migration, ScienceDaily, September 17, 2018](https://www.sciencedaily.com/releases/2018/09/180917135942.htm)
* 4.7 Billion Birds Leave U.S. to Winter in the Tropics Each Fall, UPI/Breitbart website, September 17, 2018
* [A Popular New Migration Tool Could Save Birds from Deadly Building Collisions, Audubon online, September 14, 2018](https://www.audubon.org/news/a-popular-new-migration-tool-could-save-birds-deadly-building-collisions)
* [Scientists Can Now Forecast Bird Migrations With Radar and Weather Data, Discover (blog), September 13, 2018](http://blogs.discovermagazine.com/d-brief/2018/09/13/radar-forecasting-bird-migration/#.W5ukDZNKgRw)
* [How Hurricane Florence May Affect Birds, BirdWatching Daily (blog), September 13, 2018](https://www.birdwatchingdaily.com/blog/2018/09/13/how-hurricane-florence-may-affect-birds/)
* The Deadly Lure of City Lights, *New York Time*s, op-ed, September 10, 2018
* [Night Lights, Cornell Alumni Magazine, September/October 2018](http://cornellalumnimagazine.com/night-lights/)
* [This Bird Has Been Singing the Same Song for 1,000 Years, National Geographic online, June 20, 2018](https://news.nationalgeographic.com/2018/06/swamp-sparrow-bird-sings-same-song-animals/?beta=true)
* [While You Sleep, Scientists Will Use a Space Telescope to Spy on Migrating Birds, Popular Science, May 21, 2018](https://www.popsci.com/bird-migration-night-track)
* [Spring's Uncertain Arrival Poses Problems for Migrating Birds, WESA Radio (Pittsburgh NPR), May 20, 2018](http://wesa.fm/post/springs-uncertain-arrival-poses-problems-migrating-birds#stream/0)
* [Bird Migration Explained at Last: It’s All About Energy Efficiency, Washington Post, May 7, 2018](https://www.washingtonpost.com/news/speaking-of-science/wp/2018/05/07/bird-migration-explained-at-last-its-all-about-energy-efficiency/?utm_term=.d8ed32b2ab79)
* Late Spring Imperils Birds, *Living on Earth* radio program, May 4, 2018
* New Radar-Based Maps Provide Clearer View of Present and Future Bird Migrations, *Watertown Daily Times*, April 14, 2018
* [Migration Forecasts Could Help Prevent Wind Turbines and Buildings from Killing Millions of Birds, Communications of the ACM (Association for Computing Machinery) website, April 9, 2018 (Cornell Lab)](https://cacm.acm.org/news/226760-migration-forecasts-could-help-prevent-wind-turbines-and-buildings-from-killing-millions-of-birds/fulltext)

2017 (see Van Doren et al. 2017 Altmetrics)

* [For Birds, the Sky Isn’t Just Empty Airspace. It’s Habitat](https://cornell.us2.list-manage.com/track/click?u=b35ddb671faf4a16c0ce32406&id=17d6ca057e&e=f0b505020c), Environment Guru website, November 13, 2017
* [Urban Lights Are Confusing Birds to Death](https://cornell.us2.list-manage.com/track/click?u=b35ddb671faf4a16c0ce32406&id=f7deb1cb04&e=f0b505020c), City Lab website, October 17, 2017
* [Yearly 9/11 Tribute Shows Light Pollution’s Effects on Birds](https://cornell.us2.list-manage.com/track/click?u=b35ddb671faf4a16c0ce32406&id=a6422321f1&e=f0b505020c), *New York Times*, October 2, 2017
* [Yearly 9/11 Tribute Shows Light Pollution’s Effects on Birds, New York Times, October 2, 2017](https://www.nytimes.com/2017/10/02/science/september-11-tribute-lights-birds.html?emc=edit_tnt_20171002&nlid=32867&tntemail0=y)
* Study at September 11th Tribute Site Confirms Dramatic Impact of Light on Migrating Birds, *BirdWatching*, October 2, 2017
* [Why Are These Florida birds in New Jersey? Asbury Park Press, September 19, 2017](http://www.app.com/story/news/local/land-environment/2017/09/19/why-these-florida-birds-new-jersey/682508001/)
* [At 9/11 Tribute in Light, A Rare Opportunity for Bird Researchers, WNYC Radio, The Takeaway program, September 15, 2017](http://www.wnyc.org/story/911-tribute-light-rare-opportunity-birders/)
* [Harvey Surge and Few Wetlands Puts Migrating Birds in Tough Spot, Bureau of National Affairs/Bloomberg, September 14, 2017](https://www.bna.com/harvey-surge-few-n57982087947/)
* How Do Hurricanes Affect Birds? Mother Nature Network, September 12, 2017
* [“Dark Ecology Project” Will Use Past Weather Radar Data to Trace Bird Migrations, Phys.org, July 27, 2017 (Steve Kelling, eBird)](https://phys.org/news/2017-07-dark-ecology-weather-radar-bird.html)
* How Migratory Birds Respond to Balmier Autumns, *Science Magazine* online, February 22, 2017

**Websites:** birdcast.info is a NSF and private foundation funded project providing real-time bird migration forecasts: when, where they migrate, and how far they migrate. Over a million users have visited the site in over one million sessions, with over 80% of the total user group being new during a viewing session.

**Posters and Professional Presentations (2017-2018)**

* Nilsson, C., Horton, K., Dokter, A., Van Doren, B. M., and Farnsworth, A. 2018. Migratory birds’ exposure to artificial light at night at the continental scale. 5th International Conference on Artificial Light at Night, 12-14 November. Salt Lake City, UT.
* Horton, K.G., et al, Farnsworth, A., Kelling, S. 2018. From individuals to macrosystems understanding how artificial light at night impacts migratory birds. NACCB. Toronto, Ontario, July.
* Horton, K. G., et al., Farnsworth, A. 2018. Shifted phenologies of seasonal avian migration apparent at continental scales. International Ornithological Congress. Vancouver, British Columbia, August 2018.
* Farnsworth, A. 2017. Flight behaviour of nocturnally migrating birds at the Sept 11th tribute in light memorial. Radar Aeroecology: Applications and perspectives, ENRAM, 23-24 February, Rome, Italy.
* Horton, K. G. et al., Farnsworth, A. 2017. The migrant turnstile, quantifying 21 years of migration through the Gulf of Mexico. AOS. East Lansing, Michigan, August.
* Horton KG, La Sorte FA, Van Doren BM, Fink D, Sheldon D, Farnsworth A, Kelly JF. 2017. Avian flight strategies, exploring how migrants cope with wind. ENRAM, 23-24 February, Rome, Italy.

I also presented at numerous birding clubs and functions, including Godwit Days, Western Field Ornithologists’ Conference, Houston Audubon Society, Cayuga Birding Club, Waterman Bird Club, Brookline Bird Club, Greenwich Audubon Society, New York Audubon Society, Spring Island Trust, Linnean Society, South Shore Audubon Society, Queens County Bird Club, and American Museum of Natural History.

**Additional Award and Support**

2018: NYC Audubon, Fall Roost Honoree

2007: Rea Internship in Applied Ecology
2005: Research Assistantship, Cornell Lab of Ornithology/The Nature Conservancy; Tuition/stipend.
2004: Friends of the Alleghany Front; $5,000
2004: Kieckhefer Adirondack Grant; $5,000
2001­-2002: Ford Audubon Science Fellow; $80,000
1999­-2001: Research Assistantship, DoD Legacy, Clemson University Radar Ornithology Laboratory; $150,000
1999­-2001: US Dept. of Interior, MMS (Robert W. Russell, PI), Migration Over the Gulf Project, $10,000