

CV for Anders Nielsen (2016)

DEGREES

- PhD (Statistics), Royal Vet. and Agricultural University, Denmark (2004).
- MSc (Statistics), University of Copenhagen, Denmark 2000.

POSITIONS

- Senior Scientist, DTU-Aqua, Technical University of Denmark (2012-)
- Scientist, DTU-Aqua, Technical University of Denmark (2008-2011)
- Postdoc, University of Hawaii at Manoa, USA (2005-2008).
- Project researcher, DTU-Aqua (2004).
- PhD student, Royal Veterinary and Agricultural University, Denmark (2001-2004).
- Research assistant, DTU-Aqua (2000-2001).
- Programming assistant, Professor Michael Sørensen, Aarhus School of Business, Denmark (1999).
- Statistical consultant, Danish Institute for Fisheries Research (now DTU-Aqua) (1998-2000).
- Teaching assistant, Project Supervisor and Course Writer, Royal Vet. and Agricultural University, Denmark (1996-2004).

RESEARCH AREA

- Fish stock assessment models: Develop the statistically rigorous assessment models used to assess many important ICES stocks.
- Statistical software: Core developer of AD Model Builder. Coauthor on paper introducing TMB, which shows promise to replace AD Model Builder as the platform in which to develop stock assessment models and other advanced marine models.
- Geolocation: Developed the first statistical models and software packages to geolocate archival tagged marine creatures

AWARDS

- Charles Boyden Prize **2013 Best paper published in Optimization Methods and Software**
- The Ecological Society of America's **2010 Sustainability Science Award**.

LONG TERM STAYS ABROAD

- 2002 autumn: Visited Dr. John R. Sibert at University of Hawai'i
- 2005–2008: Post doc at University of Hawai'i

RECENT TEACHING EXPERIENCE

- Stockassessment in TMB, Mont-Joli, Canada, 27 Sep 2016.
- Model Development in Fish Stock Assessment (ADMB, TMB, and SAM), ICES HQ, 2-6 Nov 2015.
- Fish stock assessment and TMB course in Perth, Australian. 18-22 May 2015.
- Fish stock assessment and TMB course in Tromsø, Norway. 25-25 Marts 2015.
- AD Model Builder and TMB course in Sete, France. 29-30 June 2014
- AD Model Builder and Stock Assessment Course at ICES HQ in Copenhagen. 18-22 February 2013.
- AD Model Builder Workshop at International Statistical Ecology Conference, Finse, Norway, 30 Jun - 1 Jul 2012.
- Stock assessment course (5-day), Namibia, December, 2011.
- Advanced data analysis and statistical modelling (full semester) at DTU-informatics. Spring 2011
- R course for biologists (5-day) at DTU-Aqua, Copenhagen, Spring 2011.
- AD Model Builder and Stock Assessment Course at ICES HQ in Copenhagen. 21-25 February 2011.
- AD Model Builder and Stock Assessment Course at Fisheries and Oceans Canada, St. John's, Newfoundland. 29 November - 3 December, 2010.
- AD Model Builder Workshop at International Statistical Ecology Conference 2010, Canterbury, UK, 5 July 2010.
- AD Model Builder Workshop at DTU-Aqua, Copenhagen, 17-18 August, 2009.
- AD Model Builder Workshop at AZTI Tecnalia, San Sebastian, 6-7 July, 2009.
- AD Model Builder Workshop at NCEAS, Santa Barbara, 9-10 March 2009.

SOFTWARE

- Nielsen, A. and Berg, C. 2009. Stockassessment.org: A state-space assessment model with a web-based user interface. The key feature is that the fish stock assessment model and the data going into the model can be customized online, which allows working groups to actually work together on providing the best assessment.
- Nielsen, A. and Sibert, J. R. and Lam, C. H. 2007. Trackit: R-package to efficiently estimate the most probable track from raw light measurements and possibly SST. Available at: <http://www.trackit.nielsensweb.org/>
- Nielsen, A., Sibert, J. R. and Lam, C. H. 2005. UKFSST/KFSST: R-package to efficiently estimate the most probable track from light-based longitude, latitude and SST. Available at: <http://www.nielsensweb.org/ukfsst/>
- Sibert, J. R. and Nielsen, A. 2003. KFtrack (Kalman Filter tracking): An add-on package for the statistical environment R to efficiently estimate movement parameters and predict most probable track from raw geo-locations of archival tagged individuals. Available at: <https://www.soest.hawaii.edu/tag-data/tracking/kftrack/>

MEMBERSHIP

- Member of the Danish Society for Theoretical Statistics.
- Founding member and board member of The AD Model Builder foundation (<http://www.admb-project.org>).

PARTICIPATION IN ICES WORKING GROUPS

- Workshop on Reviews of Recent Advances in Stock Assessment Models Worldwide (WKADSAM)
- Working Group on Methods of Fish Stock Assessments (WGMG)
- Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK)
- Baltic Fisheries Assessment Working Group (WGBFAS)
- Ad Hoc Group on Cod Recovery Management Plan
- Ad hoc group on Sandeel
- Benchmark Workshop on Roundfish

SERVICE AS INTERNATIONAL ASSESSMENT EXPERT

- Independent review report for the 2015 Northern Cod Framework Meeting
- Independent review report for the 2014 benchmark stock assessment of Atlantic Menhaden
- Independent review report for the 2014 assessment of Gulf of Mexico Gag and Greater Amberjack
- Independent review report for the 2013 Stock Assessment of Gulf of Mexico Red Snapper
- Independent review report for the 2012 Stock Assessment of Yellowtail Snapper in the South Atlantic and Gulf of Mexico.

INVITED TALKS

- 2015 Center for the Advancement of Population Assessment Methodology (Keynote): Temporal variation.
- 2014 American Fisheries Society: Estimation of time-varying selectivity in fish stock assessments using state-space models.
- 2012 International Statistical Ecology Conference: State-space fish stock assessment model as simple alternative to (semi-) deterministic approaches and full parametric stochastic models.

RESEARCH LEADER AND SUPERVISOR

- Ph.d. main supervisor of Christoffer Albertsen. Co-supervisor of Casper Berg, John Katena, and Alex Kokkalis
- Research coordinator of the statistics group at AQUA
- Founder and board member of the ADMB foundation

PUBLICATION COUNT

- Peer reviewed 36
- Other >15

PEER REVIEWED PUBLICATIONS

Albertsen, C.M, Nielsen, A., Thygesen, U.H. 2016. Choosing the observational likelihood in state-space stock assessment models. To appear in Canadian Journal of Fisheries and Aquatic Sciences.

Berg, C.W., Nielsen, A. 2016. Accounting for correlated observations in an age-based state-space stock assessment model ICES Journal of Marine Science: Journal du Conseil.

Kristensen, K., Nielsen, A., Berg, C.W., Skaug, H.J., and Bell, B. 2016. TMB: Automatic Differentiation and Laplace Approximation Journal of Statistical Software 70 (5), 1-21.

Bonanomi, S., Pellissier, L., Therkildsen, N.O., Hedeholm, R.B., Retzel, A., Meldrup, D., Olsen, S.M., Nielsen, A., Pampoulie, C., Hemmer-Hansen, J., Wisz, M.S., Grønkjær, P., Nielsen E.E. 2015 Archived DNA reveals fisheries and climate induced collapse of a major fishery. Scientific Reports. <http://dx.doi.org/10.1038/srep15395>

Albertsen, C.M., Whoriskey, K., Yurkowski, D., Nielsen, A., Flemming, J.M. 2015. Fast fitting of non-Gaussian state-space models to animal movement data via Template Model Builder. Ecology **96**(10):2598-2604

Kokkalis, A., Thygesen, U.H., Nielsen, A., Andersen, K.H. 2015. Limits to the reliability of size-based fishing status estimation for data-poor stocks. Fisheries Research **171**: 4-11.

Albertsen, C.M., Støttrup, J.G., Nielsen, A., Christoffersen, M.O. 2014. Depth preference in released juvenile turbot *Psetta maxima*. Journal of Experimental Marine Biology and Ecology **461**: 179-184.

Nielsen, A., Berg, C.W. 2014. Estimation of time-varying selectivity in stock assessments using state-space models. Fisheries Research **158**: 96-101.

Røjbek, M.C., Støttrup, J.G., Jacobsen, C., Tomkiewicz, J., Nielsen, A., Trippel, E.A. 2014. Effects of dietary fatty acids on the production and quality of eggs and larvae of Atlantic cod (*Gadus morhua* L.) Aquaculture Nutrition.

Berg, C.W., Nielsen, A., Kristensen, K. 2014. Evaluation of alternative age-based methods for estimating relative abundance from survey data in relation to assessment models. Fisheries Research **151**: 91-99

Deroba, J.J., Butterworth, D.S., Methot, R.D., De Oliveira, J.J.A, Fernandez, C., ..., Nielsen, A. 2014. Simulation testing the robustness of stock assessment models to error: some results from the ICES strategic initiative on stock assessment methods. ICES Journal of Marine Science: Journal du Conseil.

Bolker, B.M., Gardner, B., Maunder, M., Willestofte, C.B., Brooks, M., Comita, L., Crone, E., Cubaynes, S., Davies, T., Valpine, P. de, Ford, J., Gimenez, O., Kéry, M., Kim, E.J., Lennert-Cody, C., Magnusson, A., Martell, S., Nash, J., Nielsen, A., Regetz, J., Skaug, H., and Zipkin, E. 2013. Strategies for fitting nonlinear ecological models in R, AD Model Builder, and BUGS. Methods in Ecology and Evolution (ISSN: 2041-210X) (DOI: <http://dx.doi.org/10.1111/2041-210X.12044>), vol: 4, issue: 6, pages: 501-512.

Gårdmark, A., Östman, Ö., Nielsen, A., Lundström, K., Karlsson, O., Pönni, J., and Aho, T. 2012. Does predation by grey seals (*Halichoerus grypus*) affect Bothnian Sea herring stock estimates? I C E S Journal of Marine Science. **69**(8): 1448-1456.

- Eigaard, O.E., Thomsen, B., Hovgaard, H., Nielsen, A., and Rijnsdorp, A.D. 2011. Fishing power increases from technological development in the Faroe Islands long-line fishery. *Can. J. Fish. Aquat. Sci.* **68**(11): 1970-1982.
- Fournier, D.A., Skaug, H.J., Ancheta, J., Ianelli, J., Magnusson, A., Maunder, M.N., Nielsen, A., and Sibert, J. 2011. AD Model Builder: using automatic differentiation for statistical inference of highly parameterized complex nonlinear models. *Optimization Methods and Software*: 1-17.
- Pedersen, M.W., Berg, C.W., Thygesen, U.H., Nielsen, A., and Madsen, H. 2011. Estimation methods for nonlinear state-space models in ecology. *Ecological Modelling* **222**(8): 1394-1400.
- Musyl, M.K., Brill, R.W., Curran, D.S., Fragoso, N.M., McNaughton, L.M., Nielsen, A., Kikkawa, B.S., Moyes, C.D. 2011. Postrelease survival, vertical and horizontal movements, and thermal habitats of five species of pelagic sharks in the central Pacific Ocean. *Fishery Bulletin* **109**(4): 341-368.
- Gårdmark, A., Nielsen, A., Floeter, J., and Möllmann, C. 2011. Depleted marine fish stocks and ecosystem-based management: on the road to recovery we need to be precautionary. *ICES Journal of Marine Science* **68**: 212-220.
- Lam, C.H., Nielsen, A., and Sibert, J.R. 2010. Incorporating sea-surface temperature to the light-based geolocation model, TrackIt. *Mar. Ecol. Prog. Ser.* **419**: 71-84.
- Lindegren M., Möllmann C., Nielsen A., Brander K, MacKenzie B, Stenseth N. C. 2010. Ecological Forecasting under Climate Change - the case of Baltic cod. *Proceedings of the Royal Society B-Biological Sciences* **277**(1691): 2121-2130.
- Swimmer, Y., McNaughton, L., Foley, D., Moxey, L., and Nielsen, A. 2010. Movements of olive ridley sea turtles *Lepidochelys olivacea* and associated oceanographic features as determined by improved light-based geolocation. *Endang Species Res* **10**(1-3): 245-254.
- Lindegren, M., Möllmann, C., Nielsen, A., Stenseth, N. C. 2009. Preventing the collapse of the Baltic cod stock through an ecosystem-based management approach. *National Academy of Sciences. Proceedings* **106**(34): 14722-14727.
- Nielsen, A., Sibert, J., Kohin, S., and Musyl, M. 2009. State space model for light based tracking of marine animals: validation on swimming and diving creatures. *Reviews: Methods and Technologies in Fish Biology and Fisheries* 295-309.
- Sibert, J., Nielsen, A., Musyl, M., Leroy, B., and Evans, K. 2009. Removing bias in latitude estimated from solar irradiance time series. *Reviews: Methods and Technologies in Fish Biology and Fisheries* 311-322.
- Thygesen, U. H. and Nielsen, A. 2009. Lessons from a prototype geolocation problem. *Reviews: Methods and Technologies in Fish Biology and Fisheries* 257-276.
- Galuardi, B., Nielsen, A., and Lutcavage, M. 2008. Optimizing smoothed sea surface temperature for improving archival tag geolocation. *Mar. Ecol. Prog. Ser.* **365**: 35-44.
- Lam, C. H., Nielsen, A., and Sibert., J. R. 2008. Improving light and temperature based geolocation by unscented Kalman filtering. *Fisheries Research* **91**(1): 15-25.
- Nielsen, A. and Sibert., J. R. 2007. State-space model for light-based tracking of marine animals *Can. J. Fish. Aquat. Sci.* **64**(8): 1055-1068.
- Andersen, K. H., Nielsen, A., Thygesen, U. H., Hinrichsen, H. H., and Neuenfeldt., S. 2007. Using the particle filter to geolocate Atlantic cod (*Gadus morhua*) in the Baltic Sea, with special emphasis on determining uncertainty. *Can. J. Fish. Aquat. Sci.* **64**(4): 618-627.

- Neuenfeldt, S., Hinrichsen, H. H., Nielsen, A., and Andersen, K. H. 2007. Reconstructing migrations of individual cod (*Gadus morhua* L.) in the Baltic Sea by using electronic data storage tags. *Fisheries Oceanography* **16**(6), 526-535.
- Sibert, J. R., Lutcavage, M. E., Nielsen, A., Brill, R. W., and Wilson, S. G. 2006. Inter-annual variation in large-scale movement of Atlantic bluefin tuna (*Thunnus thynnus*) determined from pop-up satellite archival tags. *Can. J. Fish. Aquat. Sci.* **63**(10): 2154-2166.
- Nielsen, A., Bigelow, K. A., Musyl, M. K., and Sibert, J. R. 2006. Improving light-based geolocation by including sea surface temperature. *Fisheries Oceanography*, **15**(4): 314-325.
- Lewy, P., Nielsen, A. and Gislason, H. 2004. Stock dynamics of sandeel in the North Sea and sub-regions including uncertainties. *Fisheries Research* **68**: 237-248.
- Lewy, P. and Nielsen, A. 2003. Modeling stochastic fish stock dynamics using Markov Chain Monte Carlo. *ICES Journal of Marine Science* **60**: 743-752.
- Sparrevohn, C. R., Nielsen, A. and Støttrup J. G. 2002. Diffusion of fish from a single release point. *Can. J. Fish. Aquat. Sci.* **59**(5): 844-853
- Nielsen, A. and Lewy, P. 2002. Comparison of the frequentist properties of Bayes and the maximum likelihood estimators in an age-structured fish stock assessment model. *Can. J. Fish. Aquat. Sci.* **59**(1): 136-143.