

Caroline Durif

Citizenship: French, born 2/7/73 in Paris, France. Permanent residency in Norway

Languages: French (fluent), English (fluent), Norwegian (norskprøve 3, spoken/ written), German (academic level)

Education:

- B.A. : Population and Ecosystem Biology - Université Pierre et Marie Curie, Paris, France (1996)
- M.S. : Oceanography - Université Pierre et Marie Curie, Paris, France (1998)
- Ph.D : Aquatic Ecology - Université Paul Sabatier, Toulouse/IRSTEA Bordeaux, France (2003)

Professional experience:

- 2012-present: **Senior research scientist (forsker 1109) at Institute of Marine Research-Austevoll**, Norway
- 2008-2011: **Postdoctoral scientist at IMR-Austevoll**, Norway:
- 2004-2008: **Postdoctoral scientist at CEES-University of Oslo/IMR-Austevoll**, Norway:
- 2002-2004: **Postdoctoral scientist at IRSTEA**, Bordeaux, France:
- 1998-2003: **Doctorate at IRSTEA** (National Research Institute in Science and Technologies for the Environment and Agriculture) formerly **Cemagref**, Bordeaux, France.
- 1997-1998: **Laboratory assistant, Wimereux Marine Station**, France
- 1996-1998: **Laboratory assistant** at the AMEX (Adaptation to extreme environments), **CNRS**, (National Center for Scientific Research, Paris, France).
- 1995: **Laboratory assistant** at the Ontogeny and Fish Recruitment Laboratory, **Wimereux Marine Station**, France

Research projects

- Eel stock monitoring: IMR funded. Project leader Caroline Durif. 2011-present
- Lumpfish stock monitoring: IMR funded. Project leader Caroline Durif. 2012-present
- Wrasse monitoring: FHF funded. Principal Investigators Anne Berit Skiftesvik, Caroline Durif. 2010-present
- Fine-scale interactions in the plankton – empirical observations to parameterize trophodynamic models: IMR funded. Principal Investigators: Howard Browman, Anne Berit Skiftesvik, David Fields & Caroline Durif. 2011-present
- Cascading effects of climate change and UV enviro-toxins on the nutritional quality of the food base in marine ecosystems. NFR funded project # 178731. Principal Investigators: Howard Browman, Caroline Durif, Anne Berit Skiftesvik, Michael Arts, Ruben Sommaruga. 2007-2012
- Magnetoreception and magnetic compass orientation in the long distance migration of the European eel. NFR funded project #153843/432. Principal Investigators: Howard Browman, Anne Berit Skiftesvik, Asbjørn Vøllestad & Caroline Durif. 2004-2007
- Estimation of the reproduction capacity of European eel. (EelRep). European Research project (FP5): Q5RS-2001-01836. Principal Investigators: Guido van den Thillart, Sylvie Dufour, Pierre Elie, Caroline Durif. 2001-2004
- Impact of hydropower stations on downstream migrating eels (IRSTEA and Electricité de France). Principal Investigators: Pierre Elie, Francois Travade, Caroline Durif. 1998-2003

Advisory work

ICES:

- Norwegian delegate for lumpfish (first workshop in March 2012)
- Norwegian delegate for the ICES WGE (working group on eel) since 2006
- Norwegian delegate for the WKBaltEel (working group on Baltic eel)
- ADGeel: Advice Drafting Group on Eel (2008)

National (Norway):

- Wrasse coastal monitoring
- Eel management working group (led by DN: Direktoratet for Naturforvaltning)
- Eel management working group (led by: Fiskeridirektoratet)
- Inclusion of eel on the Norwegian red list of species

National (France):

- GRISAM (eel scientific advisory group): between 1999 and 2004

Editorial and peer-review activity of scientific journal

Academic editor: ICES Journal of Marine Science, since 2013

Academic editor: PLoS One, since 2014

Academic editor: Aquatic Biology, in 2007

Teaching experience:

- 1999-2000: **Lecturer in biostatistics** (undergraduate level) at UIT (University Institute of Technology) La Rochelle, France
- 1999: **Teaching assistant in marine ecology** (zooplankton and ichthyofauna) at the Marine Station of Arcachon, Bordeaux University, France.

List of publications

Peer reviewed publications

- Maneja, R.H., A.Y. Frommel, H.I. Browman, A.J. Geffen, A. Folkvord, U. Piatkowski, C.M.F. Durif, R. Bjelland, A.B. Skiftesvik & C. Clemmesen. 2014. The swimming kinematics and foraging behavior of larval Atlantic herring, *Clupea harengus* L., are resilient to elevated pCO₂. Journal of Experimental Marine Biology and Ecology (in press).
- Fields, D.M., J.A. Runge, C. Thompson, S.D. Shema, R.M. Bjelland, C.M.F. Durif, A.B. Skiftesvik & H.I. Browman. 2014. Infection of the planktonic copepod *Calanus finmarchicus* by the parasitic dinoflagellate, *Blastodinium* spp.: effects on grazing, respiration, fecundity, and fecal pellet production. Journal of Plankton Research (in press).
- Skiftesvik, A.B., Durif, C.M.F. Bjelland R.M. & H.I. Browman. Distribution and habitat preferences of five species of wrasse (family Labridae) in a Norwegian fjord. ICES Journal of Marine Science (in press).
- Eriksen, E., Durif, C.M.F. and Prozorkevich, D. 2014. Lumpfish (*Cyclopterus lumpus*) in the Barents Sea: development of biomass and abundance indices, and spatial distribution. ICES J. Mar. Sci; doi: 10.1093/icesjms/fsu059
- Pampoulie, C., Skirnisdottir, S., Olafsdottir, G., Helyar, S., Thorsteinsson, V., Jonsson, S., Frechet, A., Durif, C.M.F., Sherman, S., Lampart-Kaluzniacka, M., Hedelholm, R., Danielsdottir, A.K., Kasper, J.M., 2014. Concordant pattern of neutral and putatively selected microsatellite loci in lumpfish *Cyclopterus lumpus* across the North Atlantic. ICES J. Mar. Sci.; doi:10.1093/icesjms/fsu071
- Melià, P., Crivelli, A.J., Durif, C., Poole, R. & Bevacqua, D. 2014 A simplified method to estimate body growth parameters of the European eel *Anguilla anguilla*. J. Fish Biol. 85, 978984. (doi:10.1111/jfb.12486).
- Skiftesvik, A.B., Blom, G., Agnalt, A.L., Durif, C.M.F., Browman, H.I., Bjelland, R.M., Harkestad, L.S., Farestveit, E., Paulsen, O.I., Fauske, M., Havelin, T., Johnsen, K., Mortensen, S., 2014. Wrasse (Labridae) as cleaner fish in salmonid aquaculture - The Hardangerfjord as a case study. Marine Biology Research 10, 289-300.
- Maneja, R.H., Frommel, A.Y., Browman, H., Clemmesen, C., Geffen, A.J., Folkvord, A., Piatkowski, U., Durif, C.M.F., Bjelland, R.M., Skiftesvik, A.B., 2013. The swimming kinematics and foraging behavior of larval Atlantic cod, *Gadus morhua* L., are resilient to elevated pCO₂. Mar. Biol.
- Durif, C.M.F., Browman, H.I., Phillips, J.B., Skiftesvik, A.B., Vollestad, L.A., Stockhausen, H.H., 2013. Magnetic Compass Orientation in the European Eel. PLoS One 8.

- Fukunishi, Y., Browman, H.I., Durif, C.M.F., Bjelland, R.M., Shema, S.D., Fields, D.M., Skiftesvik, A.B., 2013. Sub-lethal exposure to ultraviolet radiation reduces prey consumption by Atlantic cod larvae (*Gadus morhua*). *Mar. Biol.* 160, 2591-2596.
- Skiftesvik, A.B., Bjelland, R.M., Durif, C.M.F., Johansen, I.S., Browman, H.I., 2013. Delousing of Atlantic salmon (*Salmo salar*) by cultured vs. wild ballan wrasse (*Labrus bergylta*). *Aquaculture* 402, 113-118.
- Fukunishi, Y., Browman, H.I., Durif, C.M.F., Bjelland, R.M., Skiftesvik, A.B., 2012. The effect of UV radiation on the susceptibility of Atlantic cod larvae to predation. *PLoS One* 7, e35554.
- Durif, C.M.F., Gjøsaeter, J., Vøllestad, L.A., 2011. Influence of oceanic factors on *Anguilla anguilla* (L.) over the twentieth century in coastal habitats of the Skagerrak, southern Norway. *Proc. R. Soc. B* 278, 464-473.
- Fields, D.M., Durif, C.M.F., Bjelland, R.M., Shema, S.D., Skiftesvik, A.B., Browman, H.I., 2011. Grazing rates of *Calanus finmarchicus* on *Thalassiosira weissflogii* cultured under different levels of ultraviolet radiation. *PLoS One* 6, e26333.
- Durif, C.M.F., van Ginneken, V., Dufour, S., Müller, T., Elie, P., 2009. Seasonal evolution and individual differences in silvering eels from different locations, in: Van den Thillart, G., Dufour, S., Rankin, J.C. (Eds.), *Spawning migration of the European eel: Reproduction index, a useful tool for conservation management*, Springer Netherlands, pp. 13-38.
- Durif, C.M.F., Elie, P., 2008. Predicting downstream migration of silver eels in a large river catchment based on commercial fishery data. *Fisheries Manag. Ecol.* 15, 127-137.
- Durif, C.M.F., Travade, F., Rives, J., Elie, P., Gosset, C., 2008. Relationship between locomotor activity, environmental factors, and timing of the spawning migration in the European eel, *Anguilla anguilla*. *Aquatic Living Resources* 21, 163-170.
- van Ginneken, V., Durif, C., Balm, S.P., Boot, R., Versteegen, M.W.A., Antonissen, E., van den Thillart, G., 2007. Silvering of European eel (*Anguilla anguilla* L.): seasonal changes of morphological and metabolic parameters. *Animal Biology* 57, 63-77.
- van Ginneken, V., Durif, C., Dufour, S., Sbaihi, M., Boot, R., Noorlander, K., Doornbos, J., Murk, A.J., van den Thillart, G., 2007. Endocrine profiles during silvering of the European eel (*Anguilla anguilla*) living in saltwater. *Animal Biology* 57, 453-465.
- Durif, C.M.F., Dufour, S., Elie, P., 2006. Impact of silvering stage, age, body size and condition on the reproductive potential of the European eel. *Mar. Ecol. Prog. Ser.* 327, 171-181.
- Durif, C., Dufour, S., Elie, P., 2005. The silvering process of *Anguilla anguilla*: a new classification from the yellow resident to the silver migrating stage. *J. Fish Biol.* 66, 1025-1043.
- Gosset, C., Travade, F., Durif, C., Rives, J., Elie, P., 2005. Tests of two types of bypass for downstream migration of eels at a small hydroelectric power plant. *River Res. Appl.* 21, 1095-1105.
- Durif, C., Elie, P., Dufour, S., Marchelidon, J., Vidal, B., 2000. Analysis of morphological and physiological parameters during the silvering process of the European eel (*Anguilla anguilla*) in the lake of Grand-Lieu (France). *Cybiurn* 24, 63-74.

Book chapters and conference proceedings

- Durif, C.M.F., 2012. Book review of "Eels: an Exploration, from New Zealand to the Sargasso, of the World's most amazing and mysterious fish" by James Prozek. *The Quarterly Review of Biology* 87, 169.
- Brujns, M.C.M., Durif, C.M.F., 2009. Silver eel migration and behaviour, in: Van den Thillart, G., Dufour, S., Rankin, J.C. (Eds.), *Spawning migration of the European eel: Reproduction index, a useful tool for conservation management*, Fish & Fisheries Series 30, Springer, pp. 65-95.
- Durif, C., Guibert, A., Elie, P., 2009. Morphological discrimination of the silvering stages of the European eel, in: Casselman, J.M., Cairns, D.K. (Eds.), *Eels at the edge: science, status, and conservation concerns*, American Fisheries Society Symposium 58, Bethesda, Maryland, pp. 103-111.
- Durif, C.M.F., van Ginneken, V., Dufour, S., Müller, T., Elie, P., 2009. Seasonal evolution and individual differences in silvering eels from different locations, in: Van den Thillart, G., Dufour, S., Rankin, J.C. (Eds.), *Spawning migration of the European eel: Reproduction index, a useful tool for conservation management*, Springer Netherlands, pp. 13-38.
- Durif, C., Gosset, C., Rives, J., Travade, F., Elie, P., 2003. Behavioral study of downstream migrating eels by radio-telemetry at a small hydroelectric power plant, in: Dixon, D.A. (Ed.), *Biology, Management, and Protection of Catadromous Eels*, American Fisheries Society Symposium 33, Bethesda, Maryland, pp. 343-356.

Theses

- Durif C.M.F. (2003) The downstream migration of the European eel *Anguilla anguilla*: Characterization of migrating silver eels, migration phenomenon, and obstacle avoidance, PhD thesis, University Paul Sabatier, Toulouse, France, pp. 348. Advisors: Dr. P. Elie and Dr. S. Dufour – **won the 2003 Award for best doctorate thesis (by the French Ichthyology Society)**
- Durif C. (1998) Spatial structure of planktonic ecosystems and dynamics in an epicontinental and tidally influenced sea (Eastern English Channel). MS thesis. 36 p + annexes. Advisors: Prof. B. Sautour and Dr. C. Lukzak
- Durif C. (1997): Preliminary results of a colonization experiment on hydrothermal chimneys in the Pacific East (in French). Maîtrise thesis (BS equivalent). 30 p. Advisor: Prof. F. Gaill
- Durif C. (1997): Comparison of two probability distributions: normal and gamma, 'Methods and Instrumentation in Oceanography'. 20 p. Advisor: Prof. F. Ibanez

Papers presented at international conferences

- Durif, C.M.F., Stockhausen, H.H., Browman, H.I., Skiftesvik A.B., Phillips, J., Vøllestad L.A.** 2014. Orientation and navigation of the European eel using the Earth's magnetic field and its possible implications for management. 144th American Fisheries Society meeting, Quebec, Canada.
- Browman, H.I., Maneja R.H., **Durif C.M.F.**, Bjelland R.M., Skiftesvik A.B., Fields D.M., Shema S. & Runge J.A. 2012. *Effects of ocean acidification on boreal and sub-Arctic fish larvae and zooplankton*. Interdisciplinary symposium on ocean acidification and climate change. 11-14 December 2012 The Swire Institute of Marine Science, Hong Kong

- Durif, C. M. F., Browman, H. I., Fields, D., Shema, S., Fuschino, J., Bjelland, R. M., A.B., S., Arts, M. and Sommaruga, R. 2012.** *Cascading effects of UV radiation on the nutritional quality of the food base in marine ecosystems.* 36th Larval Fish Conference. Os, Norway.
- Durif, C.M.F., O'Leary, C., Bevacqua, D., de Eyto, E., Poole, R., Walker, A., Aprahamian, A., 2012.** *A comparison of available tools and indices for determining migratory status of European eel,* 6th World Fisheries Conference, Edinburgh, UK.
- Dietert, T., Kruschel, C., Schultz, S., **Durif, C., 2011.** *Simultaneous monitoring of the European eel (Anguilla anguilla) and its benthic environment by DGPS/video supported visual census in the Croatian Adriatic,* 46th European Marine Biology Symposium, Rovinj, Croatia.
- Durif, C., Elie, P., 2010.** *Predicting downstream migration of silver eels in a large river catchment based on commercial fishery data,* 9th International Congress on the Biology of Fish, Barcelona, Spain.
- Travade, F., Gosset, C., Larinier, M., Subra, S., **Durif, C., Rives, J. and Elie, P. 2006.** Evaluation of surface and bottom bypasses to protect eel migrating downstream at small hydroelectric facilities in France. In Symposium on hydropower, Flood control and water abstraction : implications for fish and fisheries, . Mondsee, Austria.
- Dufour, S., Elie, P., Fouchereau-Peron, M., **Durif, C., 2005.** *Suppressing maturation as a requirement for eel long distance migration: neuroendocrine mechanisms and implication for induced maturation,* Fish and Diadromy in Europe, 29 March- 1st April, Bordeaux, France.
- Durif, C., Dufour, S., Elie, P., 2005.** *Impact of individual morphological and physiological characteristics on the sexual maturation of the European eel (Anguilla anguilla).* ICES Annual Conference - Advances in Reproductive Biology- 20- 24 September, Aberdeen, UK.
- Durif, C., Elie, P., 2005.** Silvering of European eels; seasonal changes of morphological and physiological parameters, Fish and Diadromy in Europe, 29 march- 1st April, Bordeaux, France.
- Durif, C., Elie, P., 2003.** *The silvering process of the European eel: characteization of intermediate stages for identification of downstream migrants,* International eel symposium, AFS meeting, Quebec, Canada.
- Durif, C., Séchet, C., Elie, P., 2003.** *Morphological and anatomical changes of the European eel during sexual maturation and under experimental conditions,* International eel symposium, AFS meeting, Quebec, Canada.
- Begout-Anras, M.L., **Durif, C., Gosset, C., Rives, J., Travade, F., 2001.** *First results of a behavioural study on seaward migrating European eel near the intake of a hydroelectric power station: comparison of radio and acoustic telemetry methods,* IV Conference on Fish Telemetry in Europe, 26-30 June, Trondheim, Norway,
- Durif, C., Elie, P., Dufour, S., Marchelidon, J., Vidal, B., 2000.** *Morphological and physiological characterization of the eel population of lake of Grand-Lieu,* 1eres rencontres de l'ichtyologie en France, Paris, France. **Award for best oral presentation**
- Durif, C., Elie, P., Gosset, C., Rives, J., Travade, F., 2000.** *Preliminary results on the behavior of downstream migrating eels (Anguilla anguilla) using radio tracking devices during a study on the impact of a small hydroelectric power plant on the river Nive (Southwest of France).* International Symposium on Catadromous Eels, American Fisheries Society, 20-24 August, Saint-Louis, MO, USA.

Invited speaker and chair

- 2014: Eel Genome Symposium – chair of the ecology session – 16-17 January, **Leiden, The Netherlands**
- 2012: *Lumpfish distribution in the Barents Sea.* **Marine Research Institute, Reykjavik, Iceland**
- 2012: *Lumpfish in Norway.* **DTU Aqua, Charlottenlund, Denmark**
- 2007 *Prediction of downstream migration of silver eels in a large river catchment.* Workshop on “Eel behavior and dams – how can we facilitate the downstream migration of silver eels?” presenter and chair - **Institute of Freshwater Research, Drottningholm, Sweden**
- 2005 *Individual variability in the characteristics of silver eels and impact on the reproductive output* **DTU Aqua, Charlottenlund, Denmark**
- 2005 *The catadromous migration of the European eel: from silvering to sexual maturation,* Biology Department, **Virginia Tech, Virginia, USA**
- 2005 *Introduction to multivariate analysis- application to the characterization of the migrating stage of the European eel,* **Institut Nationale des Sciences et Techniques de la Mer/ Institut National Agronomique de Tunis, Tunisia.**