

CONTACT INFORMATION	Laboratoire des Sciences de l'Environnement Marin (LEMAR) Institut Universitaire Européen de la Mer (IUEM) Technopole Brest-Iroise rue Dumont d'Urville, 29280 Plouzané France
	laure.pecquerie@ird.fr http://www.pageperso.univ-brest.fr/~pecquerie phone: +33 2 90 91 53 52
RESEARCH INTERESTS	Fish ecology, Life history traits, Marine ecosystems, Bioenergetic processes, Sclerochronology, Reconstruction of individual life histories, Stable isotope Analysis, Ecosystem dynamics.
EDUCATION	Ph.D. (Fisheries Sciences), Agrocampus Ouest (France), December 2007 Double Doctorate Degree (Theoretical Biology), Vrije Universiteit (Amsterdam ,the Netherlands), January 2008 Dissertation: <i>Bioenergetic modelling of the growth, development and reproduction of a small pelagic fish: the Bay of Biscay anchovy</i> Advisors: Pr. Didier Gascuel, Dr. Cédric Bacher, Pr. Sebastiaan A.L.M. Kooijman <i>M.S. equivalent</i> (Fisheries and Aquatic Sciences): Diplôme d'Agronomie Approfondie, spécialisation Halieutique. Agrocampus Ouest, France, 2002. <i>B.S. with Honors equivalent</i> (Environmental and Agricultural Sciences): Diplôme d'Agronomie Générale. Agrocampus Ouest, France, 2001. <i>Classes Préparatoires aux Grandes Ecoles BCPST</i> , Equivalent to a two-years university degree specialized in biology, chemistry, physics and mathematics. Lycée St Louis, Paris, France, 1996-1998
EMPLOYMENT	Researcher 2013 to present Institute of Research for Development Laboratoire des Sciences de l'Environnement Marin Brest, France Post-Doctoral Researcher 2008 to 2012 Ecology, Evolution, and Marine Biology, University of California Santa Barbara Santa Barbara, CA Post-Doctoral Researcher 2008 European Institute for Marine Studies, Université de Bretagne Occidentale Brest, France Graduate student 2003-2007 Ecology and Models for Fisheries Sciences, French Research Institute for the Exploitation of the Sea (Ifremer) Nantes, France

REFEREED
PUBLICATIONS

1. Lika K, Augustine S, Pecquerie L, Kooijman SALM (2014) The bijection from data to parameter space with the standard DEB model quantifies the supply-demand spectrum. *Journal of Theoretical Biology* 354: 35-47.
2. Pethybridge H, Roos D, Loizeau V, Pecquerie L, Bacher C (2013) Responses of European anchovy vital rates and population growth to environmental fluctuations: An individual-based modeling approach. *Ecological Modelling* 250: 370-383.
3. Johnson LR, Pecquerie L, Nisbet RM (2013) Bayesian inference for bioenergetic models. *Ecology* 94: 882-894.
4. Pecquerie L, Fablet R, de Pontual H, Bonhommeau S, Alunno-Bruscia M, et al. (2012) Reconstructing individual food and growth histories from biogenic carbonates. *Marine Ecology Progress Series* 447: 151-164.
5. Nisbet RM, Jusup M, Klanjscek T, Pecquerie L (2012) Integrating Dynamic Energy Budget (DEB) theory with traditional bioenergetic models. *Journal of Experimental Biology* 215: 892-902.
6. Pecquerie L, Johnson LR, Kooijman SALM, Nisbet RM (2011) Analyzing variations in life-history traits of Pacific salmon in the context of Dynamic Energy Budget (DEB) theory. *Journal of Sea Research* 66: 424-433.
7. Lika K, Kearney MR, Freitas V, van der Veer HW, van der Meer J, et al. (2011) The ?covariation method? for estimating the parameters of the standard Dynamic Energy Budget model I: Philosophy and approach. *Journal of Sea Research* 66: 270-277.
8. Kooijman SALM, Pecquerie L, Augustine S, Jusup M (2011) Scenarios for acceleration in fish development and the role of metamorphosis. *Journal of Sea Research* 66: 419-423.
9. Fablet R, Pecquerie L, de Pontual H, Hoie H, Millner R, et al. (2011) Shedding Light on Fish Otolith Biomineralization Using a Bioenergetic Approach. *PLoS ONE* 6: e27055.
10. Pecquerie L, Nisbet RM, Fablet R, Lorrain A, Kooijman SALM (2010) The impact of metabolism on stable isotope dynamics: a theoretical framework. *Philosophical Transactions of the Royal Society B-Biological Sciences* 365: 3455-3468.
11. Pecquerie L, Petitgas P, Kooijman SALM (2009) Modeling fish growth and reproduction in the context of the Dynamic Energy Budget theory to predict environmental impact on anchovy spawning duration. *Journal of Sea Research* 62: 93-105.
12. Kooijman SALM, Sousa T, Pecquerie L, van der Meer J, Jager T (2008) From food-dependent statistics to metabolic parameters, a practical guide to the use of Dynamic Energy Budget theory. *Biological Reviews* 83: 533-552.
13. Pecquerie L, Drapeau L, Fréon P, Coetzee JC, Leslie RW, et al. (2004) Distribution patterns of key fish species of the Southern Benguela ecosystem: an approach combining fishery-dependent and fishery-independent data. *African Journal of Marine Science* 26: 115-139.

14. Drapeau L, Pecquerie L, Fréon P, Shannon LJ (2004) Quantification and representation of potential spatial interactions in the Southern Benguela ecosystem. *African Journal of Marine Science* 26: 141-159.

THESES

Dissertation (2008). *Bioenergetic modelling of the growth, development and reproduction of a small pelagic fish: the Bay of Biscay anchovy*. Fisheries and Aquatic Sciences Center, Agrocampus Ouest, France. <http://dare.ubvu.vu.nl/handle/1871/11716>

M.S. Thesis (2002). *Quantification and representation of potential spatial interactions between fish species in the Southern Benguela ecosystem*. Fisheries and Aquatic Sciences Center, Agrocampus Ouest, France.

CONFERENCE PAPERS AND TECHNICAL REPORTS

Integrating Bioenergetics, spatial scales, and population dynamics for environmental flow assessments: Nisbet R.M., Anderson K.E., Pecquerie L., Harrison L. Public Interest Energy Research (PIER) Program. California Energy Commission. 76 p.

Use of coupled circulation and ecosystem NPZ models to characterise food conditions of anchovy in the Bay of Biscay: Pecquerie L., Huret M., Petitgas P. and A. Ménesguen, ICES CM, 2004/P:33, 16 p.

Modelling anchovy growth according to environmental conditions: Pecquerie L., Petitgas P., Huret M. and A. Ménesguen, ICES CM, 2005/O:21, 13 p.

PRESENTATIONS

Marques G.M. Kooijman S.A.L.M., Domingos T., and Pecquerie L., 2015. Multispecies estimation Using body scaling relationships to advance DEB parameter estimation. 4th International Symposium on Dynamic Energy Budget theory, Marseille. 28-30 April 2015

Pecquerie L., S. Garrido, S. Ferreira, A.M. Santos, P. Ré, C. Nunes, G. Marques, T. Sousa, R. Fablet, H. de Pontual 2014. Growth increment formation in fish larvae otoliths: Exploring mechanisms with a DEB approach applied to Atlanto-Iberian sardine (*Sardina pilchardus*). 4th International Symposium on Dynamic Energy Budget theory, Marseille. 28-30 April 2015

Pecquerie L., S. Garrido, S. Ferreira, A.M. Santos, P. Ré, C. Nunes, G. Marques, T. Sousa, R. Fablet, H. de Pontual, 2014. Growth increment formation in fish larvae otoliths: Exploring mechanisms with a bioenergetic modelling approach applied to Atlanto-Iberian sardine (*Sardina pilchardus*). 5th International Otolith Symposium, Mallorca. 20-24 Oct. 2014

Nunes C., G.M. Marques, L. Pecquerie, K. Ganiyas, T. Sousa, 2013 Predicting the reproductive potential of Atlantic sardine using Dynamic Energy Budget theory. 3rd DEB Symposium, 23-25 May 2013 Texel, The Netherlands <http://projects.nioz.nl/debsymposium/2195/5/0/50>

Lopez R., M. Huret, L. Pecquerie, M. Bertignac, S. Mahévas, H. de Pontual 2013. Modelling the connectivity between spawning and nursery grounds under environmental forcing: application to European Sea Bass in the Northeast Atlantic.. ICES Annual Science Conference, 23-27 Sept. 2013 Reykjavik

Pecquerie L, R. Fablet, H. de Pontual, A. Lorrain, D.P. Gillikin, E. Dufour, D. Gerdeaux, Y.M. Paulet, S.A.L.M. Kooijman, and R.M.Nisbet, 2013. Impact du métabolisme sur la formation d'un otolithe: Apports de l'approche bioénergétique Dynamic Energy Budget (DEB). Colloque de Sclérochronologie, 2nd July 2013, Rennes

Huret M., P. Petitgas, P. Gatti, L. Pecquerie, 2013. Modélisation individu-centrée de l'anchois du golfe de Gascogne: réponse aux forçages environnementaux à l'échelle de la population.. 11ième Forum AFH, 19-21 June 2013, Bordeaux.
<http://sirs.agrocampus-ouest.fr/AFH/index.php/forums-afh/243-11eme-forum>

Pecquerie L, R. Fablet, A. Lorrain, D.P. Gillikin, E. Dufour, D. Gerdeaux, Y.M. Paulet, S.A.L.M. Kooijman, and R.M. Nisbet. 2013. Understanding the impact of metabolism on $\delta^{13}\text{C}$ patterns in shells and otoliths in the context of Dynamic Energy Budget (DEB) theory. 19 May 2013, International Slerochronology Conference, Caernarfon, Royaume-Uni

Capturing the life cycle of Pacific salmon and its variations in a single modeling framework. Pecquerie L., Johnson L.R., Szabados L., Lindley S., Danner E. and R.M. Nisbet. *American Fisheries Society 141st annual meeting*, Seattle. September 2011

Analyzing variations in life-history traits in Pacific salmon. Pecquerie L., Johnson L.R., Kooijman S.A.L.M. and R.M. Nisbet. *2nd DEB Symposium*, Lisbon, April 2011

Bayesian inference of parameters for Dynamic Energy Budget models with dynamic food environments: methods and considerations. Johnson L.R., Pecquerie L. and R.M. Nisbet. *2nd DEB Symposium*, Lisbon, April 2011

Capturing species diversity with the parameters of the standard DEB model; the covariation method of estimation. 18. Lika K., Freitas V., van der Veer H., van der Meer J., Wijsman J.W.M., Pecquerie L., Kearney M.R. and S.A.L.M. Kooijman. *2nd DEB Symposium*, Lisbon, April 2011

Integrating bioenergetics, spatial scales and population dynamics for environmental flow assessments: Dynamic Energy Budget (DEB) model for Pacific salmon. Pecquerie L., Harrison L., Anderson K.E. and R.M. Nisbet. *Instream Flow Assessment Program Workshop*, UC Davis. December 2010

Dynamics of $\delta^{13}\text{C}$ isotope ratio in fish otoliths and bivalve shells in the context of the Dynamic Energy Budget (DEB) theory: Pecquerie L., Fablet R., Lorrain A., Dufour E., Gerdeaux D., Nisbet R.M. and S.A.L.M. Kooijman. *4th International Otolith Symposium*, Monterey, August 2009.

Resolving environmental effect on stage transitions in anchovy early life history using Dynamic Energy Budget (DEB) theory : Pecquerie L., Nisbet, R.M., Fablet R., Kooijman, S.A.L.M. *4th International Otolith Symposium*, Monterey, August 2009.

Can we model otolith growth and opacity patterns as a response to environmental factors and fish metabolism? A DEB-based framework: Fablet R., Pecquerie L., Hoie H., Jolivet A., Millner R., Mosegaard H., Kooijman S.A.L.M. and H. de Pontual. *4th International Otolith Symposium*, Monterey, August 2009.

Dynamics of stable isotopes in fluctuating environments: Pecquerie L., Fablet R., Nisbet R.M. and S.A.L.M. Kooijman. *DEB Theory: 30 years of research for metabolic organization*, Brest, April 2009.

Reconstructing fish life histories from otoliths in the context of the Dynamic Energy Budget (DEB) theory. Pecquerie L., Fablet R., Nisbet R.M. and S.A.L.M. Kooijman. *Invited Talk, Fisheries Ecology Division, Southwest Fisheries Science Center, Santa Cruz*, March 2009.

Reconstructing natural conditions from calcified structures of aquatic organisms in the context of the Dynamic Energy budget (DEB) theory. Pecquerie L., Fablet R., Nisbet R.M. and S.A.L.M. Kooijman. *System Biology seminars*, UCSB, November 2008.

Understanding the effect of seasonal forcing on the reproductive traits of a multiple-batch spawner in the context of the Dynamic Energy Budget (DEB) theory: the Bay of Biscay anchovy (Engraulis encrasicolus): Pecquerie L., Petitgas P. and S.A.L.M. Kooijman. *Reproductive and Recruitment Processes of Exploited Marine Fish Stocks, NAFO*, Lisbon, October 2007.

Modelling anchovy growth according to environmental conditions: Pecquerie L., Petitgas P., Huret M. and A. Ménesguen. *2005 ICES Annual Conference*, Aberdeen, September 2005.

Use of coupled circulation and ecosystem NPZ models to characterise food conditions of anchovy in the Bay of Biscay: Pecquerie L., Huret M., Petitgas P. and A. Ménesguen. *2004 ICES Annual Conference*, Vigo, September 2004.

POSTER

Mounier F., Loizeau V. , Pecquerie L., Lobry J., (2015). How to link a standard DEB model with trophic and organotrophic bioaccumulation models for different families of organic contaminants? Application to the common sole *Solea solea* in the Gironde estuary. 4th International Symposium on Dynamic Energy Budget theory, Marseille. 28-30 April 2015

Flores J., Pecquerie L., Brochier T., Tam J., Bertrand A., (2015). Comparing Peruvian anchovy and sardine early stages using a coupled DEB model with a lagrangian model. 4th International Symposium on Dynamic Energy Budget theory, Marseille. 28-30 April 2015

Brochier, T., Auger, P.-A., Thiaw, M., Pecquerie, L., Machu, E., Cheikh Mbaye, B., Brehmer, P., (2014). *Investigating Sardinella aurita seasonal migratory pattern off North-West Africa with a biophysical model*, Book of abstract *IV Congress of Marine Sciences* (ISBN - 10: 84-697-0471-0), p. 458, June 11-13 2014, Las Palmas de Gran Canaria, Spain.

Pecquerie L., Fablet R., Lorrain A., Dufour E., Gerdeaux D., Nisbet R.M. and S.A.L.M. Kooijman. (2008) *Modeling $\delta^{13}C$ dynamics in soft tissues and calcified structures of aquatic organisms in the context of DEB theory* 6th International Conference on Applications of Stable Isotope Techniques to Ecological Studies, Hawaii, August 2008.

RESEARCH AND
PROFESSIONAL
EXPERIENCE**Post-Doctoral Researcher***Ecology, Evolution and Marine Biology
University of California Santa Barbara*2008 to 2012
Santa Barbara

- Pacific salmon, full life cycle model, bioenergetic model, instream-flow assessments.
- Impact of metabolism on isotope dynamics in soft and calcified tissues
- Reconstruction of life histories
- Parameter estimation of DEB parameters using Bayesian inferences.

Post-Doctoral Researcher*European Institute for Marine Studies
Université de Bretagne Occidentale*2008
Brest, France

I studied the impact of metabolism on isotope ratios ($\delta^{13}\text{C}$) in bivalve shells and fish otoliths. Case studies: scallop (*Pecten maximus*) in the Bay of Brest (France) and whitefish (*Coregonus lavaretus*) in Annecy lake, France.

Doctoral Research*Ecology and Models for Fisheries Sciences
Ifremer*2003-2007
Nantes, France

My dissertation research focused on the impact of the environment on the spawning windows of small pelagic fish species. These spawning windows in turn impact larvae dispersal, growth and survival which are critical to understand the large fluctuations in abundance of these small pelagic fish populations. I explored in particular how a bioenergetic model of the life cycle of the Bay of Biscay anchovy (*Engraulis encrasicolus*) forced by environmental conditions simulated from a 3D biogeochemical-hydrodynamic model of the Bay of Biscay could predict inter-annual variations in anchovy spawning locations and timing.

Research Internship (M.S.)*French research Institute for Development*7 months, 2002
Cape Town, South Africa

I analyzed fishery- and survey-data to map the distribution of key fish species in the Southern Benguela ecosystem to better understand their spatial and temporal interactions. The database we created was used to parameterize a multispecies individual-based model developed by Y. Shin (French Research Institute for Development) to explore fish community dynamics through size-dependent trophic interactions.

Research Internship (B.S)*Pacific Coast Federation of Fishermen's
Associations (PCFFA)*4 months, 2001
San Francisco

I studied the Chinook salmon fishery in California with Pietro Parravano, the past president of the Pacific Coast Federation of Fishermen's Associations. Pietro Parravano was also a Commissioner on the Pew Oceans Commission and I had the chance to participate with him to the Alaska and Maine meetings in 2001 where the different stakeholders of these US coastal states presented their recommendations for the management of US coastal zones.

Research Internship (B.S)*National Federation of Small Scale Fishermen*4 months, 2000
Argentina

I studied two small-scale Argentinian fisheries in Mar del Plata and Puerto Madryn. I was in particular in contact with biologists from the Centro Nacional Patagonico that study the impact of a new fishery on the spiny dogfish (*Squalus acanthias*) population of the Valdes Peninsula.

TEACHING
EXPERIENCE

France

Comprendre l'impact du métabolisme sur les propriétés structurales et chimiques des biocarbonates (otolithes et coquilles): Apports de l'approche bioénergétique Dynamic Energy Budget (DEB). 1h (2013 and 2014). M2 Sciences de la Mer et du Littoral - IUEM- UE Sclérochronologie.

Guest lecturer (Agrocampus Ouest, France) The Dynamic Energy Budget (DEB) theory, Principles and applications - (graduate, 2h, 2008). Master Environmental studies and agriculture sciences

Guest lecturer, Teaching assistant (French Research Institute for the Exploitation of the Sea, France) Introduction to the DEB theory. Applications to fish and bivalves - (graduate, 18h, 2007)

Mexique

2015 50h, CIBNOR, La Paz (in Spanish) Introducció general a la bioenergética, a la teoria DEB (Dynamic Energy Budget) y a las herramientas básicas de modelización en biología

2014 15h, CIBNOR, La Paz (in Spanish) Introducció general a la bioenergética y a la teoria DEB (Dynamic Energy Budget) con aplicaciones en ecología marina, acuicultura y ciencias de pesquerias

Peru

2014 15h, IMARPE, Lima (in Spanish) Introducció general a la bioenergética y a la teoria DEB (Dynamic Energy Budget) con aplicaciones en ecología marina, acuicultura y ciencias de pesquerias

International DEB course - hosted by the Theoretical Biology Department of Vrije Universiteit (Amsterdam)

8th ed. 20h, Winter quarter 2015, CIBNOR, La Paz (in Spanish) + 2 lectures and labs April 2015, MIO, Marseille

7th ed. 20h, Winter quarter 2013, LEMAR, Brest + 2 lectures and labs April 2013, NIOZ, Texel

6th ed. 20h, Winter quarter 2011, UCSB + 2 lectures and labs April 2011, Instituto Superior Technico, Lisbon

5th ed. 20h, Winter quarter 2009, UCSB

UCSB - 2011-2012

EEMB 120 - Ecology - (undergraduate). 12 lectures. Summer quarter 2012.

EEMB 179/279 - Modeling Ecological and Environmental Change - (undergraduate and graduate). 4 lectures, labs and office hours. Winter quarter 2011.

PhD student advisor - Université de Bordeaux - Florence Mounier 2014-2017

Master student advisor - Universidad Peruana Cayetano Heredia - Edgar Meza Figueroa
- 2014-2015

PhD student advisor - UBO - Romain Lopez - 2012-2015

PhD student advisor - Université de Montpellier - Emmanuelle Dortel - short stays in Brest
- 2013

Undergraduate student supervisor (UCSB)

- *Life cycle, sexual determinism and metabolism of European eel (Anguilla anguilla)* - Peter Kuriyama - BIOL CS 109 Advanced Independent Research (5 months, 2009).
- *Life cycle and metabolism of Chinook Salmon (Oncorhynchus tshawytscha)* - Allison Amenta (3 months, 2009)

Master student supervisor (French Research Institute for the Exploitation of the Sea, France)

Characterization of the diet of the Bay of Biscay anchovy. Benoît Lebreton. Université de La Rochelle, France (3 months, 2004)

PROFESSIONAL
ACTIVITIES

Reviewer for: Aquaculture; Biological Reviews; Journal of Sea Research; Environmental Pollution; Aquatic Living Resources

Society Memberships: Association Française d'Halieumétrie.