Philippe GROSJEAN

Born: 20/08/1967, Brussels, Belgium
Nationality: Belgian
Married, 1 children

Professor,
PhD in Marine Biology

Area of interest: marine ecology/ecophysiology, biostatistics, growth models, population dynamics, modeling, open source software, reproducible research, plankton, corals.

Numerical Ecology of Aquatic Systems
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Activities at UMONS

Research and subcontracting

IFREMER convention (1 year, 47k€). Error correction and cell counting in colonies of phytoplankton using Zoo/PhytoImage within the REPHY network.

FIRST Spin-Off Région Wallonne (2 years, 186k€). AquaSensing: a modular plateform to study biological systems in chemostat.

F.R.F.C FNRS (equipment, 500k€). Versatile, high-performance scanning electron microscope combining high resolution and analytical capabilities in both high or low vacuum modes for applications in the biosciences and material sciences.

IFREMER convention (1 year, 73k€). Evolution of a software to automatize plankton analyses for its deployment in routine survey (REPHY network).

ARC (5 years, 500k€). Ecological Studies of Open Source Software Ecosystems (ECOS) AUWB-12/17-UMONS-3.

F.R.F.C. FNRS (4 years, 89k€). Coral Reef Ecology in Acidified Mesocosms (COREAM).

FAO (4 months, 8k€). Development of a package R to spatially interpolate climatic data (using the AURELHY method).

IFREMER convention (18 months, 25k€). Development of a software to analyze automatically phytoplankton and optimization of a learning set in the framework of REPHY ("réseau phytoplancton").

UNCOVER (1 year, 15k€). Software development in the framework of the European contract UNCOVER to optimize fisheries management strategies.

Sub-contracting for Tecnoscent (1 year, 20k€). Data mining analysis of data from a large screening of various molecules.

IFREMER convention (1 year, 9k€) Development of tools to analyze data from costal water survey programmes et for the reporting automatisation.

AMORE-3, Belgian Science Policy, SSD (2x2 years, 250k€). « Combined effect of changing hydroclimate and human activity on coastal ecosystem health ». PhD thesis funding (Kevin Denis).

SCOR Working Group 130 (3 years). « Automatic visual plankton identification ». Full member.

IFREMER convention (1 year, 25k€). Exploratory study of automated identification of phytoplankton by image analysis of microphotographies. Funding of a DEA thesis during 4 months (Kevin Denis).

Sub-contracting for ChemCom (Euroscreen) (1 year, 25k€). Data analysis, data mining and programming of a specialized software for data analysis. Funding of a post-doc during 5

months (Olivier Detournay) to initiate a new topic on the ecophysiology of corals in artificial mesocosms in the lab with this money.

UMH – Metal Process convention (1 year, 65k€). Development of functions to make an automatic recognition tool for plankton. Funding of a post-doc during 1 year (Devarajen Vaïtilingon).

ZooImage/PhytoImage (http://www.sciviews.org/zooimage). Collaboration with AZTI (San Sebastian, Spain). Organization of a workshop on image analysis of zooplankton at San Sebastian, 1-3 November 2005.

FLR. « R for Fisheries Sciences ». Contributions and collaborations with CEFAS (Lowestoft, U.K.) and AZTI (San Sebastian, Spain).

SciViews-R, **Tinn-R, PASTECS & R** (http://www.sciviews.org). Development of scientific software for data analysis, also used during teaching and research in the laboratory Translation in French of the software R (http://developer.r-project.org/TranslationTeams.html).

Creation of a research unit (Numerical Ecology of Aquatic Systems, December 2003). The group focuses on two research topics : (1) automated plankton identification using image analysis and machine learning, and (2) ecophysiology of hermatypic corals in artificial microcosms in a context of global climate changes.

Teaching and administrative work

Biostatistique & Probabilités (S-BIOG-006). Bac 2 biology, 25h + 50h practice (6 ECTS).
Biostatistique (S-BIOG-015). Bac 3 biology, 15h + 15h practice (3 ECTS).
Ecologie aquatique (S-BIOG-101). Bac 3 biology, 15h + 8h excursion (2 ECTS).
Biostatistiques appliquées (S-BIOG-025). Master 1 BOE/BBMC, 15h + 15h practice (3 ECTS).
Scientific workshop training (S-BIOG-058). With N. Devilez. master 1 & 2 BOE/BBMC (3 ECTS).
Ecologie marine (S-BIOG-068). Master 1 & 2 BOE/BBMC (7 ECTS), optional training session.
Ecophysiologie des invertébrés marins (S-BIOG-029). Master 1 & 2 BOE/BBMC (3 ECTS), optional training session.
Macro et microphotographie biologique, traitement et analyse d'image (S-BIOG-033). With M. Terzo. Master 1 & 2 BOE/BBMC (3 ECTS), optional training session.
Mésocosmes artificiels et écosystèmes aquatiques (S-BIOG-034). Master 1 & 2 BOE/BBMC (3 ECTS), optional training session.
Analyse numérique des données biologiques (S-BIOG-077). Master 1 & 2 BOE, 15h (2 ECTS), optional.
Océanographie générale (S-BIOG-105). Master 1 & 2 BOE, 15h (2 ECTS), optional course.

Administrative tasks: - Dean in second of the Science Faculty: 2008-
- President of the Institute of Biology: 2008-2009
- Member of : « Faculté des Sciences » 2003-, « Département de Biologie » 2003-, « Institut des Biosciences » 2011-, « Institut Complexys », 2011-, « Conseil de l'informatique » : 2009-

Others: - **Statistical consultancies** for master or PhD theses, or researches at UMONS or elsewhere….
- **Training workshops on S language**. Including at IFREMER Nantes, France, AZTI San Sebastian, Spain, CEFAS Lowestoft, England: initiation, advanced course, and programming (3 x 1 week).
- **Software development.** Specialized applications in R (for IFREMER, Tecnoscent, FAO, ...)

Experience before UMONS-EcoNum creation

Research

2003	**CEFAS contract**: Framework for Evaluation of Management Strategies (3 months).
2003	**CNRS contract**: development of tools (ZOOSCAN) and analysis of long term series of zooplankton, Marine Station of Villefranche/mer (6 months).
2002	**Invited scientist**: set up of data analysis tools and organization of training sessions (Splus, Pastecs), IFREMER Nantes, DEL/AO (6 months).
2001-2002	**Postdoc** in biostatistics, Marine Station of Villefranche/mer (9 months).
2000	**Consultant** at BIM (Bord Iascaigh Mhara, Irish Sea Fisheries Board). Evaluation and enhancement of an Irish sea urchin hatchery (5 weeks).
1996-2000	**European contract** FAIR CT96-1623 (BFN): "biology of sea urchins under intensive cultivation (closed cycle echiniculture)".
1991-1995	**European contract** FAR AQ2.530 (BFE): "sea urchins cultivation".
1991-1999	**Research assistant**, Université Libre de Bruxelles (ULB), Belgium. Marine Biology Laboratory, Prof. M. Jangoux. Full-time employment.

Patents

2011	**Carbochemostat**: new type of chemostat (Methods and apparatus for analysis of aquatic chemical and/or biological systems; patent PCT number WO 2013/010764 A1).
2004	**Zooscan**: digitizing device for mesozooplankton and micronecton , co-author of a patent owned by the CNRS, France (U.S. patent 20050123174 : Gorsky, G., M. Picheral & Ph. Grosjean. « Optical scanning device for liquid biological samples, process of operation and computer program for a computer connected to said device »). The ZooScan is now successfully commercialized by Hydroptic, see http://www.hydroptic.com/index.php/public/Page/product_item/ZOOSCAN)

Computing sciences

1999-	**Webmaster** (http://www.sciviews.org, dedicated to free statistical software).
1994-	**Software programmer**: **LaboKit** (data acquisition), **SciViews** (scientific GUI), **ShellAxis** (image analysis), **Pastecs** (data analysis), **Tinn-R** (code editor), **Zoo/PhytoImage** (image analysis and machine learning).

Ecophysiology (design of experimental facilities)

2011-	Original **research chemostats** to study the influence of ocean acidification, eutrophication and global warming on marine organisms.
2006-	**Artificial coral reef mesocosms** with computer-controlled physico-chemical parameters and fully controllable pCO_2/alkalinity.
1998-1999	**Experimental aquaria** with continuous control of alkalinity, CO_2 and pH.
1993-1994	Experimental devices for study of feeding and digestion in sea urchins.
1991-1999	**Pilot rearing facility for sea urchins** at the Marine Station of Luc-sur-mer, France (230 m^2, 20.000 l). **Manager** of the facility from 1992 to 1999.
1989-1991	**Prototype of a marine tropical facility** heated by sun energy: design and modelling of N and P cycles in the mesocosm (7.000 l, "PISCISOL" project). Waremmes, Belgium.

Education

2002	"**Geostatistics**", COM, Endoume Marine Station, Marseille, France, 1 week. Org.: Prof. J.-P. Durbec & P. Monestier.
2001-2002	**Postdoc**. Space-time series in marine ecology, Villefranche-sur-mer, France.
2001	**PhD thesis** (ULB, Belgium, supervised by Prof. M. Jangoux). Title: "Growth model of the reared sea urchin, *Paracentrotus lividus* (Lamarck, 1816)".
1996	NAME European Course ("**Numerical Analysis in Marine Ecology**"), Villefranche-sur-mer, France, 3 weeks. Org.: Prof. F. Ibanez.
1995	"**Numerical Analysis of Data and Signals in Marine Ecology**", Villefranche-sur-mer, France, 2 weeks. Org.: Profs. J.-P. Labat and S. Dallot.
1993	"**Advances in Mariculture**", Woods Hole, Ma, USA, 3 weeks. Org.: Dr. R. Hanlon.
1991	**Master thesis** (ULB, Belgium, supervised by Profs. R. Wollast and G. Houvenaghel). Title: "Design and modelling of a closed-circuit rearing system for reef organisms".
1986-1991	**Degree in Agricultural Engineer**, with a specialty in **Applied Zoology,** ULB, Belgium. Graduated: *magna cum laude*. Trainings in the marine stations of Roscoff, Wimereux and Calvi, France (1 week each).

Languages

French (native language), **English**, good skill (TOEFL: 580, TWE: 4), Dutch.

Additional skills

Data analysis / Modelling

Biostatistics	All topics, with a prediliection for (non) supervised classification, non linear models (quantile regression) and space-time series analysis.
Biomathematics	Growth, allometry, bioenergetics, fluxes, interactions.
Modelling	Continuous and discrete models, population dynamics, fuzzy logic.

Oceanology / Sea water chemistry / Aquaculture

Carbonates system	Chemistry and biological effects, carbon cycle.
N, P, Si cycles	Measurements, modelling, origins and biological effects.
Measures	Salinity, pH, dissolved oxygen, alkalinity,… Devices and probes.
Aquaculture techniques	Assisted fertilization, hatchery, rearing of fishes and invertebrates. Filtering systems in aquaculture and water treatment.

Computing sciences

Data analysis	R/S-PLUS, Mathematica, Matlab, Scilab, Systat, Statistica.
Imaging & GIS	MIL (Matrox Imaging Language), ImageJ.
Programming	R/S-PLUS, Tcl/Tk, PHP, HTML/XML, Javascript.
OS & networks	Linux (especially Ubuntu), Mac OS X, Windows.

❑ *Last modification: 11 november 2017.*