

CURRICULUM VITAE – PROF. DR. GIANLUCA SARA' (PH.D. 1994)

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NAME: Gianluca SARA'

SEX: Male

DATE OF BIRTH: May 19th, 1965

NATIONALITY: Italian



CURRENT POSITION

Full Professor of Ecology (Sector BIO/07)

Laboratory of Ecology (EEB) @ University of Palermo (Italy), Department of Earth and Marine Science, Viale delle Scienze, Ed. 16, I-90128 Palermo (Italy)

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Google scholar: <https://scholar.google.com/citations?user=A5GSaaoAAAAJ>

EDUCATION AND PROFESSIONAL APPOINTMENTS

2016 Full Professor, Ecology, Univ. of Palermo, Italy

2012 Provost Fellowship of 8 weeks at University of South Carolina, USA

2010 Associate Professor, Ecology, Univ. of Palermo, Italy

2007 Member of Italian Diplomatic Staff, Univ. of Lomonosov Moscow State University, Russia

2004 Assistant Professor, Ecology, Univ. of Palermo, Italy

2001 Research grant (6 months) from the University of Palermo to undertake a period of professional training at the University of Florence, Italy.

1994 Senior technician and adjunct professor of Ecology, Conservation Ecology, Marine Biology at University of Palermo, Italy

1994 Contract-researcher at the Ecology Department, University of Messina (Italy).

1994 Doctor of Philosophy in Environmental Science (University of Messina, Italy): Marine environment and resources. Title of thesis: "Effects of the trophic and environmental factors on growth performance of Mediterranean mussels (*Mytilus galloprovincialis*, LMK. 1819) cultured in open-sea in the Gulf of Castellammare (South Tyrrhenian Sea)".

1988 Degree in Biological Science (University of Palermo, Italy).

LANGUAGE SPOKEN

Italian (Native speaker); English (fluent)

COURSE ATTENDED

2000 “Design and analysis of biological experiments: an advanced course”, given by Prof. A.J. Underwood (University of Sidney, AU) and Dr M.G. Chapman (University of Sidney, AU) at the University of Lecce (Italy), 11-15 September 2000.

1999 “Design and analysis of biological experiments”, given by Prof. A.J. Underwood (University of Sidney, AU) and Dr M.G. Chapman (University of Sidney, AU) at the University of Lecce (Italy), 24 May - 4 June 1999;

1994 “PADI Dive Master” [Scuba Diving Assistant], Palermo (Italy)

1989 “Biological Methods for the study of water quality in freshwater environments: the E. B. I method”, given by Prof. P. F. Ghetti (University of Venice, Italy) at University of Trapani (Italy), 01-26 May 1989.

1989 “The role of scuba diving in the environmental monitoring” given by various Instructors at Lega Navale Italiana (Palermo, Italy), July – November 1989;

1989 “The Marine Pollution” Ustica (Italy), September 1989;

SYNERGISTIC ACTIVITIES: INVITED SPEAKER, CONVENER, EXPERT, MEMBER OF COMMITTEES (LAST 10 YEARS)

2020 Designed Member by the Foreign Italian Ministry for the Dubai Expo 2020 Scientific Committee.

2020 EU commission designed Expert for BlueGrowth and Climate Change projects.

2019 Member of the National Strategic Committee to design the Scientific Research National Agenda 2021-2027 for the Theme 13: Bioeconomy, Food and Blue growth and Theme 14: Natural Resources, Environment and Disasters risk reduction.

2019 Member of the National Committee to select Ecology Professors for the Italian Universities (ASN).

2019 EU commission designed Expert for BlueGrowth and Climate Change projects.

2019 Head of Committees to select Italian Researchers at the Italian Research Council (CNR, Rome, Italy) and the Stazione Zoologica “Anton Dohrn” (SZN, Naples, Italy).

2018 Chair of session “Biodiversity and functioning” at the XXVIII Congress of the Italian Society of Ecology (Cagliari, Italy, 12-14 September 2018).

2018 Invited speaker at Xiamen University (Xiamen, China, 17-23 April 2018).

2018 Invited speaker at EU COST, MARCONS (Rome, Italy, 16 April 2018).

2018 Invited speaker at SWIRE Institute of Marine Science (SWIMS), University of Hong Kong (Cina) (Hong Kong, China, 27 January-7 February 2018).

2018 EU commission designed Expert for BlueGrowth and Climate Change projects.

2017 Invited speaker at the “Italian Symposium of Early career ecologists”, Palermo May 5 2017.

2016 Invited speaker at “2nd Interdisciplinary Symposium On Ocean Acidification And Climate Change (ISOACC)”, SWIRE Institute of Marine Science (SWIMS) (University of Hong Kong, China, 5-9 December 2016).

2016 Opening talk of the “International Symposium on Fisheries and Aquatic Sciences (FABA)”, Mediterranean Fisheries Research Production and Training Institute (MEDFRI) (Antalya, Turkey, 3-5 Novembre 2016).

2016: Opening talk of the Aquaculture session at the Italian Marine Biology Symposium (12 May 2016, Turin, Italy).

2016 Invited scientist at University of Adelaide, Australia for the project: “Surviving in a hostile ocean: can marine organisms adapt and acclimatize to rapid climate change?” funded by “Discovery Project Australian Research Council (ARC) ID number: DP150104263” (Adelaide, Australia, 12-23 May 2016).

2015 Invited scientist at SWIRE Institute of Marine Science (SWIMS), University of Hong Kong (Cina) (Hong Kong, China, 16-25 October 2015).

2014 Invited speaker at Symposium “Respiratory adaptations across thermal clines” - 3rd International Congress of Respiratory Science (Bad Honnef, 7 July 2014, Bonn, Germany).

2014 Invited speaker at Symposium NSERC Canadian Integrated Multi-trophic Aquaculture (CIMTAN) with a talk: “Predicting mechanisms underlying integrated multi-trophic aquaculture (IMTA) species responses in a context of climate change” (Halifax, 14-16 May, Canada).

2013 Member of the Committee of the new “International Consortium to Study effects of Climate Change on marine ecosystems” (InSHORE).

2013 Invited speaker at the “Special Seminar Series - Climate change and marine ecosystems” with a seminar entitled: “The bioenergetic mechanistic analysis of organismal functional traits to predict the effects of global climate disturbance on aquatic ecosystems” (Hong Kong, China, 12-19 January 2013).

2012 Italian member of reviewer panel for the of the Intergovernmental Panel on Climate Change (IPCC) report 2013

2012 Designed coordinator by University of Palermo of cultural co-operation framework agreement between University of Palermo and the King Mongkut Institute of Technology Ladkrabang, University of Bangkok, THAILAND

2012 Designed coordinator by University of Palermo of cultural co-operation framework agreement between University of Palermo and the Faculty of Science and Technology University of Kebangsaan, MALAYSIA

2012 Designed scientific coordinator by University of Palermo for the AXA Research Fund proposal presentations

2012 Members of Scientific Committee of the “Climate Change and Aquaculture: Effects on Biology, Ecology and Productions” Workshop (March 2012, Palermo, Italy)

2012 Invited teacher at the Course (32 hours) on “Bioenergetics and the application of Dynamic Energy Budget models in the current and future casting of effects of climate change on marine organisms” (Hong Kong, China, 16-19 January 2012).

2012: Visiting Fellow funded by Provost Foundation (NSF) at Department of Biological Sciences, University of South Carolina (Columbia, SC, USA, 10 Aprile-21 Maggio 2012).

2011 Members of Scientific Committee of the Italian Society of Ecology Conference (September 2011, Palermo, Italy)

2011 Invited Scientist Bodega Bay Marine Laboratory, University of California Davis (California, USA, 12-29 July 2011).

2010 Invited speaker at University of Dublin (Dublin, Ireland, 10-18 October 2010).

SYNTHESIS OF SCIENTIFIC APPROACH & MAIN FIELDS OF RESEARCH

“A driver is any natural or human-induced factor that directly or indirectly causes a change in an ecosystem (Millennium Ecosystem Assessment 2005)”. The Man’s influence on ecosystems is all-pervasive and complex and manifested through dozens of ways, altering ecosystem structures, functioning and ability to provide goods and services through its influence on the rates of synthesis of biological structures, chemical compositions, energy and material fluxes, population processes, species interactions and, thereby biodiversity. The most of these ecosystem characteristics relies on general theories; theories make explicit quantitative

predictions based on first principles. However current theories make possible to explain most of ecosystem changes due to natural drivers but almost always there is an unpredictable residual variation due to Man's action. Such a residual variation can be measured as "departures from predictions"; the magnitude and direction of these deviations may provide clues to their causes. Then, in the broadest sense, the unifying theme of GSARA's research is how natural drivers and the induced-by-Man's-action residual variation affect ecosystem dynamics and changes, from species to population and community levels. Every form of human pressure on ecosystems, mostly aquatic, able to induce whichever deviation from natural common patterns calls my attention.

1 – EFFECTS OF MULTIPLE DRIVERS INCLUDING CLIMATE CHANGE ON ECOLOGICAL SYSTEMS AND THEIR FUNCTIONING

2 – FUNCTIONAL TRAITS OF MARINE ORGANISMS AND INDIVIDUAL BASED MECHANISTIC MODELLING COUPLED WITH INTEGRATED PROJECTION POPULATION MODELS.

3 – TROPHODYNAMICS OF SHALLOW COASTAL FLUCTUATING ENVIRONMENTS: LAGOONS, INTERTIDAL PONDS AND ESTUARIES.

4 – BIOLOGICAL AND ECOLOGICAL MODELLING, STATISTICAL DESIGN AND ANALYSIS AND QUANTITATIVE REVIEWING ANALYSIS [e.g. META-ANALYSIS].

TEACHING EXPERIENCE

Academic Year 2006 to present Teacher of course in 'Ecology' for the Faculty of Science, University of Palermo and Member in Chief of the Board of Examiners.

Academic Year 2004 to present Teacher of course in 'Applied Statistics to Marine Biology' for the Faculty of Marine Biology, Polo Didattico di Trapani, University of Palermo and Member in Chief of the Board of Examiners.

Academic Year 2004 to present Teacher of course in 'Informatics applied to management of aquaculture systems and sustainability' for the Faculty of Marine Biological Resources, University of Palermo Member in Chief of the Board of Examiners.

Academic Year 2004 to present Teacher of course in 'Conservation and management of aquatic biological resources' for the Faculty of Marine Biological Resources, University of Palermo and Member in Chief of the Board of Examiners.

Academic Year 2003 to present Teacher of course in 'Marine Biology' for the Faculty of Marine Biology, Polo Didattico di Trapani, University of Palermo and Member in Chief of the Board of Examiners.

Academic Year 2000 to present Teacher of course in 'Biological Oceanography' for the Faculty of Environmental Sciences, University of Palermo and Member of the Board of Examiners.

From 1995 to 2000 Teacher of several courses of 'Ecology' and associate topics for the Faculty of Environmental Sciences, University of Palermo and Member of the Board of Examiners.

DOCTORAL SUPERVISOR AND TUTORING

From 1990 to 2000 co-tutor of 22 Master Degree's and 2 Ph. D. Thesis

From 2004 to date, Advisor and Tutor of further 210 Undergraduate and Graduate Degree's and 21 Ph. D. students

MAJOR AFFILIATIONS

- ✓ The Italian Society of Ecology (SITE, 2000)
- ✓ American Society of Limnology and Oceanography (ASLO, 1992)
- ✓ Coastal Education Research Foundation (CERF, 1994)
- ✓ Estuarine Research Federation (ERF, 1995)
- ✓ Italian Society of Marine Science (Conisma, 1995)
- ✓ National Shellfish Association (NSA, 1998).

REVIEWER ACTIVITY

Associate Editor of **Aquaculture Environment Interactions (AEI)** (<http://www.int-res.com/journals/aei/aei-home/>)

Editorial Board of **Reviews in Fisheries Science and Aquaculture** (<https://www.tandfonline.com/toc/brfs21/current>)

MAIN COLLABORATORS AND CO-EDITORS

- G. Williams (Hong Kong U, China)
- B. Helmuth (South Carolina U, USA)
- S. Connell (Adelaide U, Australia)
- M. Kearney (Melbourne U, Australia)
- Y. Dong (Xiamen U, China)
- E. Carrington (Washington U, USA)
- M. Troell (Royal Swedish Ac. Science, Sweden)
- G. Reid (Fisheries and Oceans, Canada)
- S.A.L.M. Kooijman (Vrije U, The Netherlands)
- K. Sebens (Washington U, USA)

A SELECTION OF 15 PUBLICATIONS OF LAST TWO YEARS (2017-2020) (FOR THE WHOLE LIST OF PUBLICATIONS AND DOWNLOADING, GO TO: <http://www1.unipa.it/gsaralab/en/publications/#1>)

Author of over 400 scientific articles (**including more than 151 ISI peer-reviewed articles**), 1 Ph.D. dissertation, 3 books (in Italian), 2 book chapters and over 45 program research reports. **Co-author of the book "Ecology" (in Italian) edited by UTET (Pusceddu, A., Sarà, G., Viaroli, P. 2020 – Ecology. UTET, pp. 362)**

1. Mangano, M.C., Mieszkowska, N., Helmuth, B., Domingos, T., Sousa, T., Baiamonte, G., Bazan, G., Cuttitta, A., Fiorentino, F., Giacoletti, A., Johnson, M., Lucido, G. D., Marcelli, M., Martellucci, R., Mirto, S., Patti, B., Pranovi, B., Williams, G. A. and Sarà, G. in press 2020. Moving towards a strategy for addressing climate displacement of marine resources: a proof-of-concept. *Frontiers in Marine Science*.

2. La Manna, G. and Sarà, G. 2019. Exploring boating traffic in a Mediterranean Marine Protected area (Capo Gallo and Isola delle Femmine) and possible implications for management. *Integrated Environmental Assessment and Management* 15: 961-973.
3. Bellino, A., Mangano, M.C., Baldantoni, D., Russell, B.D., Mannino, A.M., Mazzola, A., Vizzini, S. and Sarà G. 2019. Coastal lagoon biodiversity in a changing climate. *Diversity and Distribution* 25: 1512-1526.
4. Mieszkowska, N., Benedetti-Cecchi, L., Burrows, M., Mangano, M.C., Queiros, A., Seuront, L. and Sarà, G. 2019. Multinational, integrated approaches linking organismal to biogeographic impacts of climate change: an opinion paper. *Marine Ecology Progress Series* 613: 247-252.
5. Sarà, G., Gouhier, T.C., Brigolin, D., Porporato, E.M.D., Mangano, M.C., Mirto, S., Mazzola, A., Pastres, R. 2018. Predicting shifting sustainability trade-offs in marine finfish aquaculture under climate change. *Global Change Biology* 24: 3654-3665.
6. Sarà, G., Porporato, E.M.D., Mangano, M.C. and Mieszkowska, N. 2018. Multiple stressors facilitate the spread of a non-indigenous bivalve in the Mediterranean Sea. *Journal of Biogeography* 45: 1090-1103.
7. Sebens, K. P., Sarà, G and Carrington, E. 2018. Estimation of fitness from energetics and life-history data: an example using intertidal mussels. *Ecology and Evolution* 8: 5279-5290.
8. Mangano, M.C., Giacoletti, A. and Sarà, G. 2019. Dynamic Energy Budget provides mechanistic derived quantities to implement the ecosystem based management approach. *Journal of Sea Research* 143: 272-279.
9. Connell, S.D., Doubleday, Z.A., Foster, N.R., Hamlyn, S.B., Harley, C.D.G., Helmuth, B., Kelaher, B.P., Nagelkerken, I., Rodgers, K.L., Sarà, G. and Russell, B.D. 2018. The duality of ocean acidification as a resource and a stressor. *Ecology* 99: 1005-1010.
10. Giacoletti, A., Cappello, S., Mancini, G., Mangano, M. C. and Sarà, G. 2018. Predicting the effectiveness of oil recovery strategies in marine polluted environment. *Journal of Environmental Management* 223: 749-757.
11. Capodici, F., Ciralo, G., Cosoli, S., Maltese, A., Mangano, M.C. and Sarà, G. 2018. Downscaling hydrodynamics features to depict causes of major productivity of Sicilian-Maltese area and implications for resource management. *Science of Total Environment* 628: 815-825.
12. Sarà, G., Mangano, M.C., Johnson, M., Mazzola, A. 2018. Integrating multiple stressors in aquaculture to build the blue growth in a changing sea. *Hydrobiologia* 809: 5–17.
13. Connell, S.D. Doubleday, Z. A., Hamlyn, S.B., Foster, N.R., Harley, C.D.G., Helmuth, B., Kelaher, B.P., Nagelkerken, I., Sarà, G. and Russell, B.D. 2017. How ocean acidification can benefit calcifiers. *Current Biology* 27(3): R95-R96.
14. Harley, C.D.G. Connell, S.D., Doubleday, Z.A., Kelaher, B., Russell, B.D., Sarà, G. and Helmuth, B. 2017. Conceptualizing ecosystem tipping points within a physiological framework. *Ecology and Evolution* 7: 6035-6045.
15. Mangano, M.C. and Sarà, G. 2017. Collating science-based evidence to inform public opinion on the environmental effects of marine drilling platforms in the Mediterranean Sea. *Journal of Environmental Management* 188: 195-202.

RESEARCH PROJECTS (FROM 2004- TO DATE)

2020-2022 Italia-Malta V-A 2016 second call [**Principal Investigator and project coordinator**]: “Capitalization of HARMONY results (SenHAR)” - code C2-3.1-115 Priority Axis 3, Specific objective 3.1.

2020-2022 Minister of University of Italian Government - (MIUR), Italian Research Projects in Antarctica (PNRA) [**Leader of Local Research Unit**]: “ROSSs Sea ecosystem and emerging contaminants: new challenges and potential threats in a changing world (ROSS'n'ROLL)”.

2019-2022 Programme Italie-Tunisie 2014-2020 - Coopération Transfrontalière (CT) de l'Union Européenne [**Leader of Local Research Unit**]: “Invasion biologique marine et pêche: étude, atténuation des dommages et adaptation dans le contexte du changement climatique” [BLEU-ADAPT]”.

2019-2022 Programme Italie-Tunisie 2014-2020 - Coopération Transfrontalière (CT) de l'Union Européenne [**Leader of Local Research Unit**]: “Promouvoir et développer une aquaculture multi-trophique durable et intégrée [PATINER]”.

2019-2022 Minister of University of Italian Government - Research Programmes of National Interest (PRIN) [**Leader of Local Research Unit**]: “MARine Habitats RESToration in a climate change-impaired Mediterranean Sea (MAHRES)” . Joint Project with other Italian Universities.

2018-2021 Italia-Malta V-A 2016 [**Principal Investigator and project coordinator**]: “The Italo-Maltese harmonization for a Good Environmental Status: sea-floor integrity and interactions with invasive species to preserve the marine ecosystem functioning (HARMONY)” - code C1-3.1-31 Priority Axis 3, Specific objective 3.1.

2015-2018 Australian Research Council (ARC) [**Co-Principal Investigator**]: “Surviving in a hostile ocean: can marine organisms adapt and acclimatize to rapid climate change?” (Principal Investigator: Prof. S. Connell, Adelaide U, Australia)

2013-2015 Italian Research Projects in Antarctica (PNRA) [**Leader of Local Research Unit**]: “TUNU Euro-Arctic Marine Fishes (TEAM-Fish): Climate change impact on biodiversity, adaptation and contaminants in comparison with Antarctica”.

2014-2015 Hong Kong Research Grants Council [**Co-Principal Investigator**] Joint Project School of Biological Sciences/The University of Hong Kong (Prof. Gray Williams) “Predicting the fate of marine bivalves in a warming world”.

2013-2015 Minister of University of Italian Government - Research Programmes of National Interest (PRIN) [**Leader of Local Research Unit**]: “Observing, Modelling And Testing Synergies And Trade-Offs For The Adaptive Management Of Multiple Impacts In Coastal Systems (TETRIS)” . Joint Project with many Italian Universities.

2011 Environmental Minister of Italian Government [**Principal Investigator and project coordinator**]: “The intertidal system of Effect of recreational nautical noise on marine communities and behaviour of fish in a Marine Protected Area (Capo Gallo and Isole delle Femmine, Northern Sicily) (DINAUTIS)”.

2009-2011 Italian Research Projects in Antarctica (PNRA) [**Leader of Local Research Unit**]: “Flows of POPs between polar Abiotic and Biotic compartments (POP-LAB)” . Joint Project with University of Siena and Florence (Italy).

2010 Sicilian Regional Government [**Principal Investigator and project coordinator**]: “Scientific divulgation and public concern in Sicily 3”.

2008-2010 Climate Impact Research Coordination for a Larger Europe (CIRCLE) [**Principal Investigator and project coordinator**]: “The impact of climate change on Mediterranean intertidal communities: losses in coastal ecosystem integrity and services (INTER-MED)” , Joint Research Project with University of Haifa and University of Dubrovnik.

2008-2009 Italian Minister of Agriculture and Fisheries (MIPAF) [**Leader of Local Research Unit**]: “Effects of organic pollutants on marine pelagic food webs: tuna and swordfish” .

2008 Italian Research Council (CNR) and DAIMAR company, [**Principal Investigator and project coordinator**]: “Effect of noise on behaviour of coastal organisms”.

2008 Sicilian Regional Government – POR Misura 4.17, [**Principal Investigator and project coordinator**]: “Scientific divulgation and public concern in Sicily 2”.

2007-2008 Environmental Minister of Italian Government [**Principal Investigator and project coordinator**]: “Effect of recreational nautical noise on marine communities and behaviour of fish in a Marine Protected Area (Capo Gallo and Isole delle Femmine, Northern Sicily)”.

2007-2008 ENI-ICRAM, [**Leader of Local Research Unit**]: “FAD effect of platforms on the surroundings: structure and dynamics of associated communities and effect on the behaviours”.

2007 Sicilian Regional Government [**Principal Investigator and project coordinator**]: “Scientific divulgation of culture of the Sea and public concern in Sicily”.

2006-2007 Sicilian Regional Government, POR [**Principal Investigator and project coordinator**]: “An integrated model of coastal management using sustainable aquaculture for reducing the impact of mariculture”.

2007 URS-ENI [Leader of Research Unit]: “Analysis of pipeline impact on soft bottom benthic invertebrates in the Gela marine area (Southern Sicily)”.

2007 World Wildlife Fund (WWF Italy) and Sicilian Local Government: “Analysis and distribution *Procambarus clarkii* inside a Regional Reserve (Preola and Gorghi Tondi Lakes, Western Sicily)”.

2004 BIOCE Project, European Union and University of Reykjavik (Iceland), [Leader of Research Unit]: “Food web analysis and biomagnification in Sandgerdi shores (Iceland) using multiple stable isotopes”.

REFERENCES

- ✓ Prof. Gray Williams, (University of Hong Kong, CHINA; email: hrsbwga@hku.hk)
- ✓ Prof. Brian Helmuth (Northeastern University, Marine Science Center, Boston, MA, USA; email: b.helmuth@neu.edu)
- ✓ Prof. John Widdows (Plymouth Marine Laboratory, Plymouth, UK; email: johnwiddows@btinternet.com)

Palermo, Italy 19/06/2020

Gianluca Sarà

