



INTERNATIONAL
OTOLITH
SYMPOSIUM

Viña del Mar, Chile
October 9-13, 2023

Handbook



PONTIFICIA
UNIVERSIDAD
CATÓLICA DE
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HUMBOLDT II
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GRAN ECOSISTEMA MARINO





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Organizing Committee

Conveners

Francisco Cerna Troncoso	Instituto de Fomento Pesquero, Valparaíso, Chile.
Guido Plaza Pasten	Pontificia Universidad Católica de Valparaíso, Chile.

Local committee

Daniela Díaz	Instituto de Fomento Pesquero, Valparaíso, Chile.
Edwin Niklitschek	Universidad de los Lagos, Chile.
Mauricio Landaeta	Universidad de Valparaíso, Chile.
Miguel Araya	Universidad Arturo Prat, Chile.
Alejandra Volpedo	Universidad de Buenos Aires, Argentina.
Esteban Avigliano	Universidad de Buenos Aires, Argentina.
André Vaz dos Santos	Universidade Federal do Paraná, Brasil.
Cristiano Albuquerque	Universidad Federal Rural do Semi-Árido, Brasil.

Steering committee

Allen Andrews	Department of Oceanography University of Hawaii at Manoa, Honolulu, HI USA.
Steven Campana	University of Iceland, Iceland.
Chih-Wei Chang	National Academy of Marine Research, Kaohsiung, Taiwan.
Audrey Geffen	University of Bergen, Norway.
Jane A. Godiksen	Institute of Marine Research, Norway.
Bronwyn Gillanders	University of Adelaide, Australia.
Karin Hüssy	Technical University of Denmark (DTU Aqua), Denmark.
Gregor Cailliet	San José State University, USA.
Karin Limburg	State University of New York (SUNY), USA.
Antoni Lombarte	Institut de Ciències del Mar (ICM-CSIC), Spain.
Erlend Moksness	Institute of Marine Research, Norway.
Beatriz Morales-Nin	Mediterranean Institute for Advanced Studies (IMEDEA), Spain.
Jacques Panfili	Institut de recherche pour le développement (IRD), France.
Jen-Chieh Shiao	National Taiwan University, Taiwan.
Kotaro Shirai	University of Tokyo, Japan.
Dianne Tracey	National Institute of Water and Atmospheric Research (NIWA), New Zealand.
Chia-Hui Wang	National Taiwan Ocean University, Taiwan.
Guido Plaza	Escuela de Ciencias del Mar, Pontificia Universidad Católica de Valparaíso, Chile.
Francisco Cerna	División de Investigación Pesquera, Instituto de Fomento Pesquero (IFOP), Chile.
Amber-Robyn Childs	Rhodes University, Grahamstown, South Africa.
Clive Trueman	University of Southampton, United Kingdom.
Anna Sturrock	University of Essex, United Kingdom.

7th IOS Secretary

Josefa Rodríguez A.	Instituto de Fomento Pesquero, Valparaíso, Chile.
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Design and layout

Mario Recabal M.	Instituto de Fomento Pesquero, Valparaíso, Chile.
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Chile welcomes you!

On behalf of the Symposium organizers, it is a great pleasure for us to welcome you to Viña del Mar, Chile for the 7th International Otolith Symposium. This scientific event will provide a unique forum for students and scientists to present their new studies, discuss potential new applications, project future perspectives and expand their research networks. In this version, the 7th IOS will receive scientists and graduate students from over 40 countries all around the world.

We also welcome the presence of international experts who will offer keynote conferences and workshops to review and project disciplinary advances as well as address methodological issues on otolith research and other calcified structures.

We express our deep gratitude to all the participants, and we wish you a pleasant, fruitful and memorable stay in Viña del Mar.



Francisco Cerna Troncoso
División de Investigación Pesquera
Instituto de Fomento Pesquero
Valparaíso, Chile

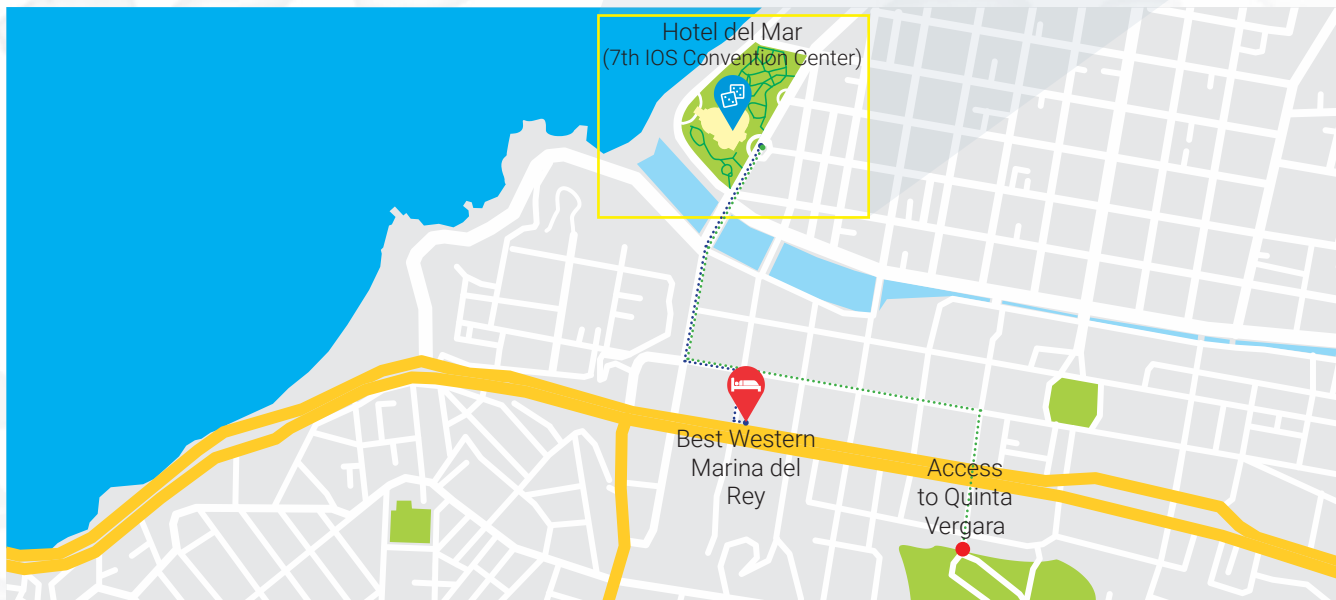
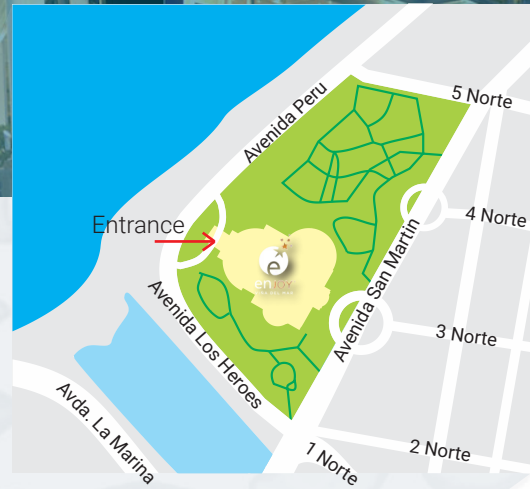


Guido Plaza Pasten
Escuela de Ciencias del Mar
Pontificia Universidad Católica de Valparaíso
Valparaíso, Chile



Locations and maps

The 7th IOS is held at the Convention Center, located at Avenida Perú, Viña del Mar, Chile (Hotel del Mar).



Addresses

Hotel del Mar 7th IOS Convention Center

Avenida Perú
Viña del Mar

Best Western Marina del Rey Banquet hall

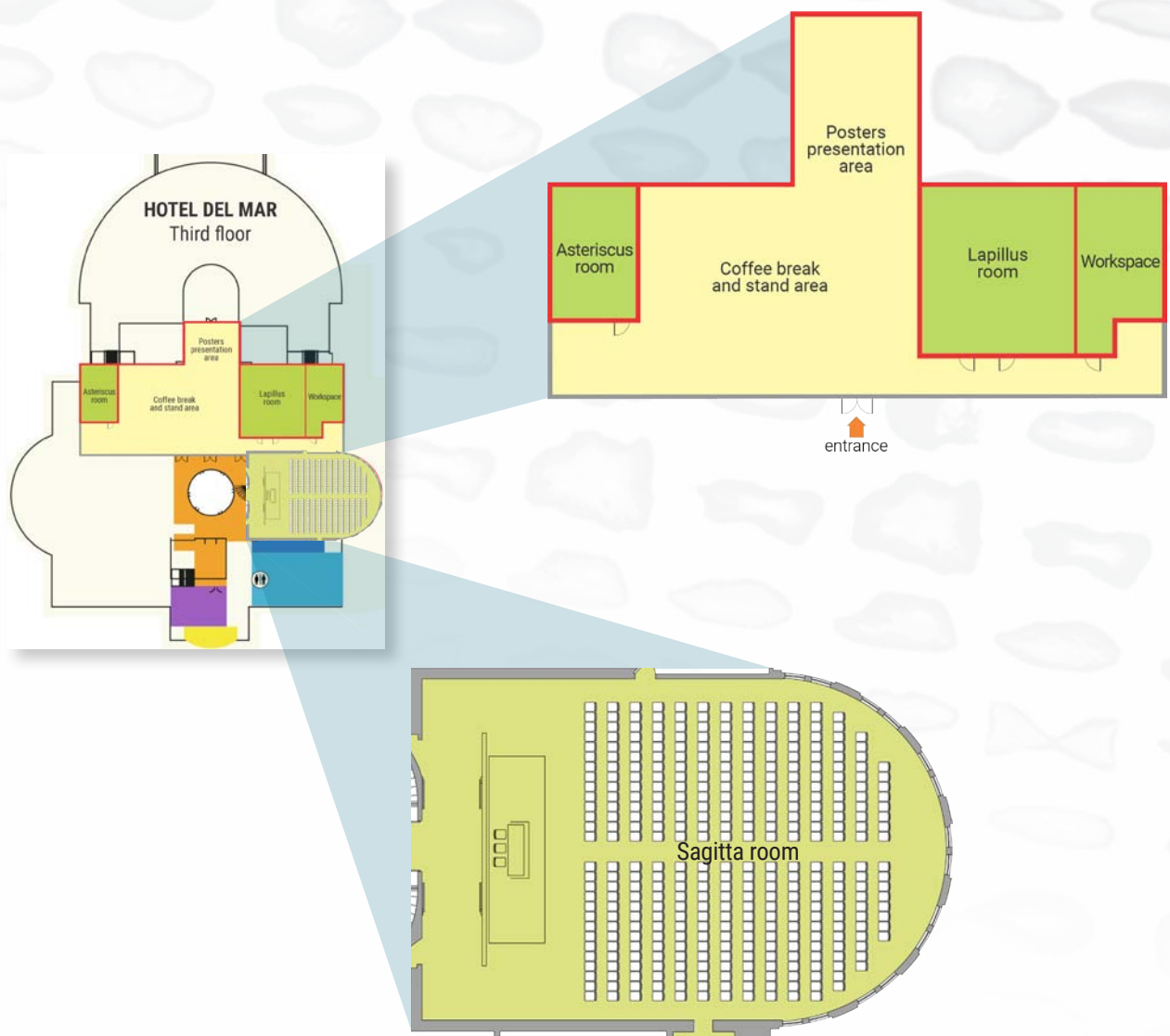
Ecuador 299 street
Viña del Mar

Access to Quinta Vergara

Welcome
reception
Errázuriz with
Quinta street
Viña del Mar



Distribution of space Symposium Meeting Rooms



General Information

Oral Presentations

The Symposium program will include oral presentations (**15 minutes total + 5 minutes for questions**) and poster sessions.

Oral presentations should be prepared in MS Powerpoint format (.ppt or .pptx)

The presenting authors are asked to adhere to their time limit.



Posters

Poster presentations will be held on **October 10h, 2023**.

Once delegates arrive, they will be directed to the Poster Room and informed about the poster board location.

All posters have to be printed A0 size (**80 cm x 130 cm**) in portrait layout. Tapes to mount the poster will be provided during the event.

Posters can be installed at the beginning of the Symposium and we encourage their display until the end of the 7th IOS.

Registration

Participants can register at:
 Quinta Vergara's "Patio de las columnas" on Sunday, October 8.
 (17:30 – 18:30 hrs)
 7th IOS Convention Center on Monday, October 9.
 (08:00 – 17:00 hrs)

Welcome Reception

Sunday, October 8 (17:30 – 20:30 hrs).

Our welcome reception will be held on Sunday afternoon at the Quinta Vergara's "Patio de las columnas"; in Viña del Mar. All 7th IOS members are invited to participate and enjoy a cocktail, as well as a traditional dance performance of Viña del Mar's Folkloric Ballet, also known as "BAFOVI".

Poster Presentations

Monday, October 10 (17:00 – 20:30 hrs).

Poster Sessions will take place on Tuesday afternoon at the lobby of the Convention Center, where delegates will discuss and share their studies with the rest of the participants. During this event a refreshing cocktail will be available for all participants with open bar privileges.

Banquet

Thursday, October 12 (20:00 – 23:30 hrs).

The banquet will take place at the Events Room of the Hotel Marina del Rey, located at Ecuador 299, Viña del Mar. It will consist of a buffet dinner, accompanied by a variety of foods and beverages.

Closing Ceremony

Friday, October 13 (17:00 – 18:00 hrs).

The Closing Ceremony for the 7th Otolith Symposium will take place at the Sagitta room of the Convention Center of Hotel del Mar, Viña del Mar. It will include: (i) short summary on symposium statistics; (ii) best oral presentation and best poster prizes; (iii) an introduction to the 8th IOS host.

Travel information

Transportation

All International flights arrive at the international airport Arturo Merino Benitez of Santiago de Chile, and from here, Viña del Mar is located 120 km away. To arrive to Viña del Mar, the delegates can use some of the following way of transportation.

Transfer from Airport to Viña del Mar

The delegates can take an Uber, Cabify or DIDI services to travel directly from the airport to Viña del Mar, for an approximate cost of \$80USD.

From Airport to Pajaritos Bus Station

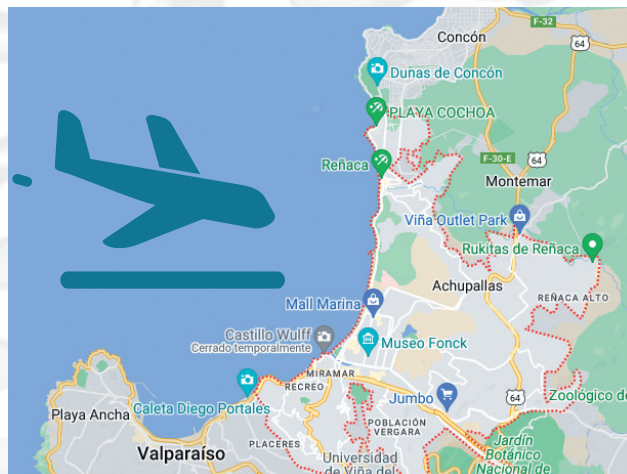
From the International Airport, delegates need to go first to Pajaritos bus station and then take a bus to Viña del Mar.

From airport to Pajaritos bus station there are two choices: Turbus and CentroPuerto companies. These services operate from Monday to Sunday between 06:00 and 22:45 hrs., with an approximate cost of \$1,800 CLP (~\$2.5 USD).

From Pajaritos Bus Station to Viña del Mar

At the Pajaritos bus station, the delegates should go to the bus terminal and look for Turbus or Pullman Bus companies, among others. The cost of the ticket depends on the day (regular days or special holidays), but it starts at about \$ 5,000 CLP for one-way ticket (~\$6.00 USD).

Once delegates arrive to the bus station in Viña del Mar, they can take Uber, Cabify, DIDI or taxis services to arrive at their hotels. Official terminal taxis are located in the basement of the bus station. The cost of these services can vary from \$5,000 to \$15,000 CLP.



Useful Tips

Money and currency

The official currency is the Chilean Peso (CLP). Chile has the following banknotes: \$1,000 CLP; \$2,000 CLP; \$5,000 CLP; \$10,000 CLP and \$20,000 CLP. The coins in circulation are: \$10; \$50; \$100; \$500 CLP.

Generally, outside of major hotels, it is not possible to pay with a foreign currency.

ATMs and credit cards

ATMs are the easiest way to access your money in Chile.

ATMs are found inside banks and large supermarkets.

Credit cards, such as Visa and MasterCard, are accepted in most hotels and restaurants.

The amount of money you can withdraw from an ATM generally depends on the conditions attached to your card, although most ATMs will dispense no more than \$200,000 CLP per day (~ \$230 USD).

Voltage in Chile

The voltage in Chile is 220 V.

The plugs and sockets are of type C and L (<https://www.power-plugs-sockets.com/chile/>).

Keynote speakers

The 7th IOS will offer the following six main conferences.



Dr. Clive Trueman

Associate professor
University of Southampton
United Kingdom

Dr. Clive Trueman has a degree and PhD in geology from the University of Bristol, and stayed there for his PhD on the chemistry of fossil (dinosaur) bone. Then he went to do his postdocs at the Smithsonian Institution and Weizmann Institute in Israel, applying chemical tools to understand fossil hominid and archaeological sites. In 2004, Dr. Clive Trueman moved back to the UK to take up a lectureship at the University of Portsmouth. While there, he changed his research focus to modern fishes. That's when he really discovered scales and otoliths as chemical archives of ecological and life history data. Since then, his research group has been working on developing and applying chemical tools to infer aspects of life history, ecology and physiology in mostly marine fishes.



Dr. Bronwyn Gillanders

School of Biological Sciences,
University of Adelaide,
Australia

Professor Bronwyn Gillanders is based in the School of Biological Sciences at the University of Adelaide, Australia. She completed her BSc at the University of Canterbury (New Zealand), MSc at the University of Otago (NZ) and PhD at the University of Sydney (Australia). She has previously held three ARC Research Fellowships and is now a Faculty member at the University of Adelaide. Her research focuses on freshwater, estuarine and marine systems addressing fisheries, ecological and environmental questions. She uses calcified structures of aquatic organisms (otoliths, shells, teeth, and vertebrae or other bones) as innovative tools to understand past environments, population structure and biological processes, such as age, growth and movement patterns. Her most recent work is using portfolio effects as a conceptual model to characterise sub-population variation in migratory strategies of estuarine fish. She is past president of both the Australian Society for Fish Biology and the World Council of Fisheries Societies.



Dr. John Morrongiello

School of Biosciences, University
of Melbourne
Australia

John is a Senior Lecturer at the University of Melbourne where he leads the Quantitative Aquatic Ecology and Evolution research group. He is also vice President of the Australian Society for Fish Biology. John works across both marine and freshwater systems where he investigates how fish respond to environmental change on contemporary and evolutionary time scales. He is keenly interested in the impacts of, and adaptations to, fishery activity, natural and human-induced flow variability, and rapid environmental change. John asks questions at different levels of biological organization, ranging from individuals to assemblages, using field-based and experimental techniques. John has extensive experience in assessing the impacts of fishing, river regulation and climate change on aquatic environments (both local and global scales). He is passionate about novel applications of otolith-based data to generate insight into the long-term drivers of biological change in our rivers and oceans.



Dr. Karin Hüsey

National Institute of Aquatic
Resources, Technical University
of Denmark,
DTU

Dr. Karin Hüsey is a senior scientist in fish biology, population ecology and interdisciplinary fisheries sciences at the National Institute of Aquatic Research, Technical University of Denmark. She is interested in understanding how physical and chemical properties of the environment interact with biological processes to regulate otolith biomineralization and chemical composition. The main goal of her research is to use the chronological information stored in the otoliths to infer knowledge on fish growth, habitat use and movement that can ultimately improve fish stock assessment and sustainable management.



Dr. Anna Sturrock

School of Life Sciences,
University of Essex
United Kingdom

Dr Anna Sturrock (@otolithgirl) is an Assistant Professor and UK Research and Innovation Future Leaders Fellow at the University of Essex, UK. With a passion for translating science into practical solutions for ecosystem conservation and management, her research uses archival tissues such as otoliths to reconstruct the behaviour, growth, health and survival of fishes, and their responses to stressors such as warming and habitat loss. Having completed her MSc at the University of Otago, New Zealand, her PhD (University of Southampton and Centre for the Environment, Fisheries & Aquaculture Science, UK) focused on the value and limitations of otolith chemistry as a tool to describe marine fish population structure and migration pathways. This included measuring elemental concentrations in water, blood and otolith chemistry over a full annual cycle to explore the relative importance of physiological vs. environmental signals. For her postdoctoral research at the University of California, Santa Cruz, Berkeley and Davis, she used otolith strontium isotopes and microstructure to explore how human interventions (hatchery practices, dam operations and land-use change) and hydroclimatic variability influence the growth, behaviour and survival of Chinook salmon. She is currently developing multi-tracer (e.g. elements, isotope ratios, compounds, hormones), multi-tissue (e.g. otoliths, eye lenses, muscle, scales) and multi-tool (e.g. isotopes, genetics, tagging, modelling) frameworks to assess fish movements and health to inform aquatic resource management. With a lot of help and mentorship from the sclerochronology (and wider) community she has explored the extent to which otoliths can address otherwise insurmountable knowledge gaps, and fully appreciates the value of cross-discipline collaboration to increase understanding, confidence and trust. She currently co-leads a working group for European COST Action Sea Unicorn (www.sea-unicorn.com) with the aim of advancing and integrating methods to quantify and predict connectivity at sea and across the land-sea interface. Her most recent endeavour has been initiation of the 'EXTRACT' (EXploration, TRanslation and Application of Chemical records in fish Tissues) network, to help connect the community and facilitate sample, data and knowledge-sharing.



Dr. Edwin Niklitschek

Universidad de Los Lagos,
Puerto Montt,
Chile

Edwin Niklitschek is a fish ecologist graduated from the University of Maryland (USA), currently affiliated to the Universidad de Los Lagos in Puerto Montt (Southern Chile). Among his multiple, and rather diverse, scientific interests, he has investigated the structure of demographic units, the diversity of life-cycles and the connectivity of exploited fish populations, mainly in the ecosystems of the Humboldt Current and the Patagonian Fjords. Otolith chemistry and mixing models have been his tools of choice for these research initiatives. Also interested in understanding the trophic ecology of those ecosystems, he has collaborated with recent studies aimed at evaluating the potential implications of life-cycle diversity and partial migration on the trophic ecology of migratory pelagic and demersal fishes. Most of his current efforts are devoted to understanding and evaluating the effects of fishing, aquaculture, and other anthropic impacts on the ecology of fish, birds, and marine mammals, particularly in southern Chile.

Workshops

WORKSHOP 1

Wednesday 11th

Workspace room

A beginner's (and/or refresher) course in otolith ageing and imaging

Organizers:

Steven Campana (University of Iceland, Iceland)

Bronwyn Gillanders (University of Adelaide, Australia)

This workshop is intended to provide an introduction to fish otolith ageing for those with little or no prior experience, as well as to provide a refresher for those with more experience. Using an informal, hands-on workshop approach, participants will learn a few of the main methods for otolith preparation, as well as protocols and tips for identifying, interpreting and counting the annual growth bands. The majority of the workshop will be spent in learning modern imaging and enhancement techniques, some of which may be new even to experienced otolith readers. Participants should bring their own laptop computers if they want to practise the enhancement techniques.

Workshop agenda

Time	Title of activity	Description
09:00 - 10:45	Otolith preparation and sectioning	Surface and crack and burn methods
10:45 - 11:00	 COFFEE BREAK	
11:00 - 12:00	Otolith imaging, enhancement and interpretation	Image enhancement with Photoshop; interpretation of otolith sections
12:00 - 18:00	 FREE TIME (Optional Tour)	

WORKSHOP 2

Wednesday 11th

Sagitta room

An introduction to using chemical tracers in otoliths and other structures

Organizers:

Karin Limburg (State University of New York College of Environmental Science & Forestry and Swedish University of Agricultural Sciences)

Benjamin Walther (Texas A&M University Corpus Christi)

Co-organizers:

Yvette Heimbrand (Swedish University of Agricultural Sciences)

Jessica Lueders-Dumont (UC Santa Cruz)

John Mohan (University of New England)

Anna Sturrock (Essex University)

In this workshop, we will provide an introduction to the field of fish otolith chemistry, covering different types of markers and methods, as well as comparative approaches. We will also include a brief overview of other promising chronometric structures.

Workshop agenda

Time	Title of activity	Speaker
09:00 - 09:15	Questions about otolith chemistry. Will start by sending out the PollEverywhere (https://www.poll Everywhere.com/) link so people tell us their experience level and specific interests (to help guide our discussion)	Ben Walther
09:15 - 09:45	Markers to answer questions	John Mohan
09:45 - 10:00	Other structures, complementary analyses	Karin Limburg
10:00 - 10:15	Growth and physiology	Anna Sturrock
10:15 - 10:30	Archeological studies	Jessica Lueders-Dumont
10:30 - 10:45	Q&A	
10:45 - 11:00	 COFFEE BREAK	
11:00 - 12:00	Clinic/interactive discussion / Ideas for clinic: ~3 break out groups	
12:00 - 18:00	 FREE TIME (Optional Tour)	

WORKSHOP 3

Wednesday 11th

Lapillus room

A beginner's course in otolith morphometry

Organizers:

Antoni Lombarte (Institut de Ciències del Mar-CSIC, Barcelona, Catalonia, Spain)

Victor Tuset (Universidad de Las Palmas de Gran Canaria, Spain)

An introduction to anatomical concepts and representation of otoliths, determination of classic morphometries, allometries and morphometric indices, geometric morphometries and contour analyses. Advantages and disadvantages of each analysis. How and when to use the different methods. Practices on the standardization of images, shape analyses, statistical analyses and interpretation of results.

Workshop agenda

Time	Title of activity	Speaker
09:00 - 09:50	Measuring shape: classic biometrics, allometry, indexes, geometrical morphometry, contour analysis.	Antoni Lombarte
09:50 - 10:45	Morphometrics and geometrical morphology. Data acquisition and their analysis	Victor M. Tuset
10:45 - 11:00	 COFFEE BREAK	
11:00 - 12:00	Outline shape analyses: Fourier and wavelets Data acquisition, analysis and classification systems	Víctor M. Tuset
12:00 - 1800	 LUNCH TIME AND FREE TIME (Optional Tour)	

WORKSHOP 4

Wednesday 11th

Asteriscus room

SmartDots: an introduction

Organizers:

Jane Aanestad Godiksen (Institute of Marine Research, Bergen, Norway)

Julie Coad Davies (DTU Aqua, National Institute of Aquatic Resources, Lyngby, Denmark)

Annelie Hilvarsson (SLU Aqua, Institute of Marine Research, Sweden)

Karen Bekaert (ILVO, Flanders Research Institute for Agriculture, Fisheries and Food, Belgium)

This workshop consists of a short presentation and then exploration on their own. We will demonstrate the uses for training, calibration and general quality assurance of age reading. We will also demonstrate the functionalities of the SmartDots reporting module.

Workshop agenda

Time	Title of activity	Speakers/Moderators
09:00 - 09:30	Introduction to the use of SmartDots (long version)	Julie Coad Davies & Jane Aanestad Godiksen
09:30 - 10:45	Speed-dating with SmartDots	Jane Aanestad Godiksen, Karen Bekaert, Annelie Hilvarsson & Julie Coad Davies
10:45 - 11:00	 COFFEE BREAK	
11:00 - 11:15	Introduction to the use of SmartDots (short version)	Karen Bekaert
11:15 - 12:00	Speed-dating with SmartDots	Jane Aanestad Godiksen, Karen Bekaert, Annelie Hilvarsson & Julie Coad Davies
12:00 - 18:00	 LUNCH TIME AND FREE TIME (Optional Tour)	

Program

MONDAY 09TH OCTOBER 2023



THEME: Life history, demography and connectivity studies

Moderators: Beatriz Morales-Nin & Alejandra Volpedo

Time	Code	Title	Authors
11:10	IOS_235	Comparative study on sagittae shape, morphometry, and age structures from two populations of <i>Scorpaena porcus</i> (Linnaeus, 1758) inhabiting the Strait of Messina (Central Mediterranean Sea) and Split area (North-Central Mediterranean Sea)	Claudio D'Iglio* , Sergio Famulari, Marco Albano, Serena Savoca, Gioele Capillo, Josipa Ferri
11:30	IOS_004	Ecotype diversification as mechanism for coexistence in extreme environments – the case of northern pike (<i>Esox lucius</i>) in brackish lagoons	Timo Rittweg* , Clive Trueman, Michael Wiedenbeck, Jan Fietzke, Robert Arlinghaus
11:50	IOS_006	Temperature effects on otolith shape; results from a long-term experiment	Florian Berg* , Arild Folkvord
12:10	IOS_207	Otoliths as tools to understand changes and patterns in fishes from South America to North America	Leticia Cavole*
12:30	IOS_008	Otolith shape analysis as a tool for stock separation of European pilchard (<i>Sardina pilchardus</i>) in the Algerian coast	Nadjette Bourehail*
13:00		LUNCH TIME	

THEME: Life history, demography and connectivity studies

Moderators: Jane Aanestad Godiksen & Jessica Farley

Time	Code	Title	Authors
14:20	IOS_173	Age determination of Atlantic cod using Fourier-transform near infrared spectrometry	Aaron Adamack* , Kelly Antaya, Sudagar Dhaliwal, Karen Dwyer, Shelley Lang, Christina Bourne
14:40	IOS_048	Integrating machine learning with otolith isoscapes: reconstructing connectivity of a marine fish over four decades	Kohma Arai* , Martin Castonguay, Vyacheslav Lyubchich, David H. Secor
15:00	IOS_150	"Jesstimation": a new method to estimate the fractional age of species with protracted spawning	Jessica Farley* , Paige Eveson, Kyne Krusic-Golub, Naomi Clear, Francois Rouspard, Caroline Sanchez, Simon Nicol, John Hampton
15:20	IOS_215	The contribution of Artificial Intelligence on otolith research: State-of-the-art, perspectives and challenges	Dimitris Politikos, Kathleen Angélica Rautenberg, Eduardo Luis Cupertino Ballester, Paulo Ricardo Schwingel, André Martins Vaz-dos-Santos*
15:40	IOS_163	SmartDots – creating a link between fish ageing and stock assessment modelling	Julie Coad Davies* , Karen Bekaert, Carlos Pinto, Wim Allegaert, Kevin De Coster, Patricia Gonçalves, Jane Aanestad Godiksen, Côme Denechaud, Annelie Hilvarsson, Cindy van Damme, Ulrika Beier, Colin Millar, Alfonso Pérez Rodríguez
16:20		COFFEE BREAK	

THEME: Life history, demography and connectivity studies

Moderators: Florian Berg & Margit Wilhelm

Time	Code	Title	Authors
16:40	IOS_123	Studying growth drivers in strong year-classes of redfish (<i>Sebastes spp.</i>) from the Gulf of St. Lawrence, Canada based on otolith-derived biochronology	Lola Coussau* , Dominique Robert, Olivier Morissette, Pascal Sirois
17:00	IOS_166	Biannual otolith translucent zone formation of Cape hake <i>Merluccius capensis</i> in Namibia is regulated by ontogeny and extremes	Margit Wilhelm* , Anja van der Plas
17:20	IOS_025	Ageing different calcified structures; does the structure matter?	Florian Berg* , Eydna í Homrum, Julie Coad Davies, Stina Bjørk Stenersen Hansen, Erling Kåre Stenevik
17:40	IOS_036	Investigating the optimal growth temperature of a sub-tropical deepwater snapper, <i>Pristipomoides multidens</i> , from Gascoyne Bay, Australia	Clement Z. W. Ng* , Júlio G. Gonzalez, Muhammad Faiq, Corey B. Wakefield, Stephen J. Newman, Ong J. L. Joyce
18:00	IOS_125	Fin spine chemistry advances knowledge of Atlantic bluefin tuna's early life history migrations	Patricia Lastra L.* , Saburo Sakai, Gorka Bidegain, Iraide Artetxe Arrate, Pedro Morais, Fanny Claverie, Christophe Pecheyran, Igaratza Fraile, Hilario Murua, Haritz Arrizabalaga

MONDAY 09TH OCTOBER 2023

Lapillus room

THEME: Past and recent aquatic ecosystem ecology and climate change indicators

Moderators: Clive Trueman & Peter Grønkjær

Time	Code	Title	Authors
11:10	IOS_153	Cold fish in hot water – growth and field metabolic rates of juvenile Atlantic cod exposed to peak summer temperatures	Peter Grønkjær* , Jonathan Christensen, Kris-Emil Mose Jørgensen, Freja Holm Dahl, Halvor Knutsen, Per Erik Jorde, Ming-Tsung Chung
11:30	IOS_209	Otolith oxygen isotopes unravel mysteries of Eastern School Whiting (<i>Sillago flindersi</i>) and Stout Whiting (<i>Sillago robusta</i>) along the east coast of Australia	Melissa Tan* , Karina Hall, Brendan Kelaheer
11:50	IOS_015	Highly necessary and obvious effectiveness of Fishing Ban on the Yangtze River demonstrated by a “Indicator” species <i>Coilia nasus</i>	Jian Yang* , Tao Jiang, Hongbo Liu, Xiubao Chen
12:10	IOS_147	Exploring the relationship between hypoxia and mesopelagic fish growth using otolith increments: a case study from western Norwegian fjords	Francesco Saltalamacchia* , Martine Røysted Solås, Arild Folkvord, Anne Gro Veia Salvanes
12:30	IOS_176	Effects of lifetime hypoxia exposure on fish mercury uptake and food web structure	Hadis Miraly, N. Roxanna Razavi, Matthew Altenritter, Elizabeth Duskey, Richard T. Kraus, Ann Marie Gorman, Karin E. Limburg*
13:00		LUNCH TIME	

THEME: Past and recent aquatic ecosystem ecology and climate change indicators

Moderators: Steven Campana & John Morrongiello

Time	Code	Title	Authors
14:20	IOS_099	Otolith biochronology for the long-term reconstruction of growth and stock dynamics of fish	Szymon Smoliński* , Julita Gutkowska
14:40	IOS_210	Sixty-year biochronology for Golden Redfish <i>Sebastes norvegicus</i> based on otolith growth-increment widths in the Northeast Arctic	Christine Lucas* , Bryan Black, Hector Andrade Rodriguez
15:00	IOS_044	Reconstructing long-term growth of deep-water snappers throughout the Pacific using otolith chronologies	Joseph Widdrington* , Patrick Reis-Santos, John Morrongiello, Jed Macdonald, Simon Nicol, Bronwyn Gillanders
15:20	IOS_069	Using otoliths to understand how marine heatwaves affect fish growth	Jessica Randall* , Bryan Black, Stephen Swearer, Emily Fobert, John Morrongiello
15:40	IOS_086	Fish in warm water: growth of brown trout across thermal and hydrological gradients in Australia	Patricia Y. Koh* , Matthew West, Jarod P. Lyon, John R. Morrongiello
16:00	IOS_155	Using otolith biochronologies from sardine (<i>Sardinops sagax</i>) in the Benguela to identify ecosystem shifts	Faye Brinkman* , Margit Wilhelm, Yonela Geja, Carl D. van der Lingen
16:20		COFFEE BREAK	

THEME: Evolutionary, biological and biogeographic characteristics

Moderators: Antoni Lombarte & Chia-Hui Wang

Time	Code	Title	Authors
16:40	IOS_038	Otolith shape variation among ontogenetic stages and cryptic species of the flathead grey mullet <i>Mugil cephalus</i> in Taiwan	Qin-Yun Wu* , Chia-Hui Wang
17:00	IOS_067	Stock identification of red mullet in the Mediterranean Sea: Comparative analysis of otolith shape from 2D and 3D images	Nicolas Andrialovanirina* , Émilie Poisson Caillault, Sébastien Couette, Rémi Laffont, Lauriane Poloni, Camille Lutet-Toti, Kélig Mahé
17:20	IOS_128	The diversity of otolith shapes: an ecomorphological study at a large phylogenetic scale	Arthur Van Damme* , Antoni Lombarte, Bruno Frédérich, Ricardo Betancur-R., Effrosyni Fatira, Tanja Schulz-Mirbach, Aline Paiva M. de Medeiros, Eric Parmentier, Victor M. Tuset
17:40	IOS_196	Understanding the shape plasticity of fish otoliths based on Diffusion Limited Aggregation model simulations	Paulo Duarte-Neto* , Joé Edson Gondim, Borko Stosic
18:00	IOS_034	Isotope chronologies in eye lenses reveal deficiencies in marine diets linked to reproductive failure in California Salmon, USA	Rachel C. Johnson* , Carson Jeffres, Steve Litvin, Iliana Ruiz-Cooley. I., Jacques Rinchar J. , Abbigail Ward, Alexandra Chu, Danhong Li, Miranda Bell-Tilcock, Matt Emard, John Field, Nate Mantua, Steve Lindley, Miles Daniels, Donald Tillitt, Dale Honeyfield, Bruce Finney

TUESDAY 10TH OCTOBER 2023



09:10 Keynote Conference by Dr. Karin Hüsey

Presenter: Karin Limburg

THEME: Past and recent aquatic ecosystem ecology and climate change indicators

Moderators: Karin E. Limburg & Bronwyn Gillanders

Time	Code	Title	Authors
10:00	IOS_047	The effects of climate change on spatial-temporal distribution and early life history of three cryptic mullet species in Taiwan	Yu-Ling Nien* , Chia-Hui Wang
10:20	IOS_050	Otolith morphometrics in a changing Arctic - Challenges and new insights in the population structure of Atlantic cod	Lisa Spotowitz* , Torild Johansen, Agneta Hansen, Erik Berg, Christoph Stransky, Markus Brand, Philipp Fischer
10:40	IOS_029	Marked recent declines in boron in Baltic Sea cod otoliths – a bellwether of incipient acidification in a vast hypoxic system?	Karin E. Limburg* , Yvette Heimbrand, Karol Kuliński
11:00		COFFEE BREAK	



11:20 Keynote Conference by Dr. Clive Trueman

Presenter: Erlend Moksness

12:10	IOS_092	Otoliths on acid: a meta-analysis of ocean acidification effects on otoliths	Patrick Reis-Santos* , Christopher Izzo, Bronwyn Gillanders
12:30	IOS_023	Acidification effect on fish otoliths shape: adaptive capacity to long-term effects	Kélig Mahé* , David Mazurais, Kirsteen M. MacKenzie, Théo Coutin, Olivier Mouchel, Arianna Servili, Bruno Ernande, José Luis Zambonino-Infante
12:50	IOS_149	Cod otoliths document accelerating climate impacts	Yvette Heimbrand* , Karin Limburg, Karin Hüsey, Tomas Naeraa, Monica Mion, Michele Casini
13:10		LUNCH TIME	

THEME: Past and recent aquatic ecosystem ecology and climate change indicators

Moderators: Yvette Heimbrand & Jessica Lueders-Dumont

Time	Code	Title	Authors
14:20	IOS_080	Using Stable Isotopes to investigate growth variability in juvenile Baltic Sea herring (<i>Clupea harengus</i> L.)	John Taylor* , Gustav Andersson, Andrius Garbaras, Agnes ML Karlson
14:40	IOS_064	Growth response of an estuarine fish to past and present environmental conditions	Koster G. Sarakinis* , Patrick Reis-Santos, John Morrongiello, Qifeng Ye, Jason Earl, Bronwyn M. Gillanders
15:00	IOS_172	Growth rate extremes of a Sciaenid in an ocean-warming hotspot	Charmaine E Jagger, Margit R Wilhelm* , Warren M Potts
15:20	IOS_127	Taxonomic and ecological shifts in Caribbean reef fish communities since the Holocene explored in otolith assemblages	Aaron O'Dea, Brigida De Gracia, Chien-Hsiang Lin, Jessica Lueders-Dumont*
15:40	IOS_201	Nitrogen isotopes from modern and fossil Myctophidae otoliths track changes in nutrients fueling Caribbean food webs since the Miocene	Jessica A. Lueders-Dumont* , Aaron O'Dea, Brigida de Gracia, Daniel M. Sigman, Seth Finnegan
16:00	IOS_019	Fossil otolith $\delta^{18}O$ and $\delta^{13}C$ reveals the process leading to a local extirpation of demersal fishes in deep time	Konstantina Agiadi* , Iuliana Vasiliev, Geanina Butiseacă, George Kontakiotis, Danae Thivaoui, Evangelia Besiou, Stergios Zarkogiannis, Efterpi Koskeridou, Assimina Antonarakou, Andreas Mulch
16:20		COFFEE BREAK	

TUESDAY 10TH OCTOBER 2023

THEME: Life history, demography and connectivity studies

Moderators: Edwin Niklitschek & Esteban Avigliano

Time	Code	Title	Authors
10:00	IOS_110	Migration and habitat use of the Japanese grenadier anchovy <i>Coilia nasus</i> in the Ariake Sea, Japan	Tianying Li* , Yulina Hane, Hiroki Takenaka, Ryoshiro Wakiya, Tomihiko Higuchi, Kento Goto, Kotaro Shirai, Kazuki Yokouchi, Shingo Kimura, Hikaru Itakura
10:20	IOS_113	Stable isotope ratios in otoliths and eye lenses reveal population connectivity of sardine in the western North Pacific and its marginal seas	Tatsuya Sakamoto* , Amélie Simon, Kotaro Shirai
10:40	IOS_130	Otolith microchemistry reveals contrasting intra-stock structuring in two demersal species off the Iberian Peninsula	Georgios Kerametsidis* , Sílvia Pérez-Mayol, Esther Abad, Jorge Landa, Encarnación García, Miguel Vivas, Antonio Esteban, Antonio Punzón, Angelique Jadaud, Vincent Rossi, Beatriz Morales-Nin, Manuel Hidalgo
11:00		COFFEE BREAK	



11:20 Keynote Conference by Dr. Clive Trueman

Presenter: Erlend Moksness

THEME: Life history, demography and connectivity studies

Moderators: Edwin Niklitschek & Cristiano Queiroz de Albuquerque

Time	Code	Title	Authors
12:10	IOS_076	Stable isotope composition of otolith nuclei as a tool to assign spawning components of Baltic cod (<i>Gadus morhua</i>)	Sven Stötera* , Uwe Krumme, Nils Andersen, Franziska Maria Schade
12:30	IOS_056	Chasing the great migrant: deciphering the connectivity of yellowfin tuna in the Indian Ocean using otolith stable isotopes	Iraide Artetxe-Arrate* , Iker Zudaire, Patricia Lastra-Luque, Jessica Farley, Naomi Clear, David Dettman, Shoaib Abdul Razzque, Iñigo Krug, Umair Shahid, Gorka Merino, Hilario Murua, Igaratza Fraile
12:50	IOS_061	Otolith microchemistry and spatial stream network models: investigating natal origins and freshwater habitat use for Broad Whitefish (<i>Coregonus nasus</i>) in Arctic, Alaska	Jason C. Leppi* , Daniel J. Rinella, Randy J. Brown, Karen J. Spaleta
13:10		LUNCH TIME	

THEME: Life history, demography and connectivity studies

Moderators: Anna Sturrock & Charlotte Gauthier

Time	Code	Title	Authors
14:20	IOS_009	Assessment of spatial and temporal stability of tributary-specific otolith trace element signatures	Olivier Raven* , Gerard Closs, Jayde Couper, Leo Nagelkerke
14:40	IOS_018	Life history traits and migration of wild mangrove snapper (<i>Lutjanus argentimaculatus</i>) in the waters off Taiwan	Yeh Yun-Ting* , Nien, Yu-Ling, Lu, Chien-Yu, Chiang, Wan-Chen, Wang, Chia-Hui
15:00	IOS_020	A multi-scale approach to assess homing and straying rates of Atlantic salmon (<i>Salmo salar</i>) in the New Aquitaine region	Anthony Fontaine* , Matthias Vignon, H��l��ne Tabouret, Alexandre Holub, Christophe P��cheyran, David Nachon, Josu Huarte, Gilles Bareille
15:20	IOS_054	Habitat use and migratory patterns of Atlantic halibut in the Gulf of St. Lawrence	Charlotte Gauthier* , Dominique Robert, Jonathan Fisher, Pascal Sirois
15:40	IOS_066	Migration history of Pacific cod around Hokkaido, Japan, using 14C analysis of otoliths	Keito Aonuma* , Kozue Ando, Yosuke Miyairi, Masayuki Chimura, Tomonori Hamatsu, Osamu Sakai, Yusuke Yokoyama
16:00	IOS_084	Diet journals recorded in eye lenses reveal critical habitats supporting an endangered salmon	Carson Jeffres* , Miranda Bell-Tilcock, Anna Sturrock, Rachel Johnson
16:20		COFFEE BREAK	
17:00		POSTER SESSION & COCKTAIL	

WEDNESDAY 11TH OCTOBER 2023

WORKSHOP 1

Workspace room

A beginner's (and/or refresher) course in otolith ageing and imaging

Organizers:

Steven Campana (University of Iceland, Iceland)

Bronwyn Gillanders (University of Adelaide, Australia)

Time	Title of activity	Description
09:00 - 10:45	Otolith preparation and sectioning	Surface and crack and burn methods
10:45 - 11:00	 COFFEE BREAK	
11:00 - 12:00	Otolith imaging, enhancement and interpretation	Image enhancement with Photoshop; interpretation of otolith sections
12:00 - 18:00	 FREE TIME (Optional Tour)	

WORKSHOP 2

Sagittae room

An introduction to using chemical tracers in otoliths and other structures

Organizers:

Karin Limburg (State University of New York College of Environmental Science & Forestry and Swedish University of Agricultural Sciences)

Benjamin Walther (Texas A&M University Corpus Christi)

Co-organizers:

Yvette Heimbrand (Swedish University of Agricultural Sciences)

Jessica Lueders-Dumont (UC Santa Cruz)

John Mohan (University of New England)

Anna Sturrock (Essex University)

Time	Title of activity	Speaker
09:00 - 09:15	Questions about otolith chemistry. Will start by sending out the PollEverywhere (https://www.polleverywhere.com/) link so people tell us their experience level and specific interests (to help guide our discussion)	Ben Walther
09:15 - 09:45	Markers to answer questions	John Mohan
09:45 - 10:00	Other structures, complementary analyses	Karin Limburg
10:00 - 10:15	Growth and physiology	Anna Sturrock
10:15 - 10:30	Archeological studies	Jessica Lueders-Dumont
10:30 - 10:45	Q&A	
10:45 - 11:00	 COFFEE BREAK	
11:00 - 12:00	Clinic/interactive discussion / Ideas for clinic: ~3 break out groups	
12:00 - 18:00	 FREE TIME (Optional Tour)	

WEDNESDAY 11TH OCTOBER 2023

WORKSHOP 3

Lapillus room

A beginner's course in otolith morphometry

Organizers:

Antoni Lombarte (Institut de Ciències del Mar-CSIC, Barcelona, Catalonia, Spain)

Victor Tuset (Instituto de Oceanografía y Cambio Global, IOCAG, Universidad de Las Palmas de Gran Canaria, Unidad Asociada ULPGC-CSIC, Canary Islands, Spain)

Time	Title of activity	Speaker
09:00 - 09:50 ..	Measuring shape: classic biometrics, allometry, indexes, geometrical morphometry, contour analysis.	Antoni Lombarte
09:50 - 10:45 ..	Morphometrics and geometrical morphology. Data acquisition and their analysis	Victor M. Tuset
10:45 - 11:00	 COFFEE BREAK	
11:00 - 12:00 ..	Outline shape analyses: Fourier and wavelets Data acquisition, analysis and classification systems	Victor M. Tuset
12:00 - 1800	 FREE TIME (Optional Tour)	

WORKSHOP 4

Asteriscus room

SmartDots: an introduction

Organizers:

Jane Aanestad Godiksen (Institute of Marine Research, Bergen, Norway)

Julie Coad Davies (DTU Aqua, National Institute of Aquatic Resources, Lyngby, Denmark)

Annelie Hilvarsson (SLU Aqua, Institute of Marine Research, Sweden)

Karen Bekaert (ILVO, Flanders Research Institute for Agriculture, Fisheries and Food, Belgium)

Time	Title of activity	Speaker/Moderator
09:00 - 09:30	Introduction to the use of SmartDots (long version)	Julie Coad Davies & Jane Aanestad Godiksen
09:30 - 10:45	Speed-dating with SmartDots	Jane Aanestad Godiksen, Karen Bekaert, Annelie Hilvarsson & Julie Coad Davies
10:45 - 11:00	 COFFEE BREAK	
11:00 - 11:15	Introduction to the use of SmartDots (short version)	Karen Bekaert
11:15 - 12:00	Speed-dating with SmartDots	Jane Aanestad Godiksen, Karen Bekaert, Annelie Hilvarsson & Julie Coad Davies
12:00 - 18:00	 FREE TIME (Optional Tour)	

THURSDAY 12TH OCTOBER 2023



09:10 Keynote Conference by Dr. John Morrongellio

Presenter: Steven Campana

THEME: Life history, demography and connectivity studies

Moderators: Dianne Tracey & Pascal Sirois

Time	Code	Title	Authors
10:00	IOS_117	Extent of anadromy among pike (<i>Esox lucius</i>) in eastern Baltic Sea and coastal fresh water bodies	Mehis Rohtla* , Roland Svirgsden, Imre Taal, Lagle Matetski, Kateriina Rumvolt, Mari-Liis Põlme, Markus Vetemaa
10:20	IOS_167	Stock structure of Atlantic tomcod in the St. Lawrence River (Canada) as revealed by otolith elemental fingerprints	Louis Landry-Massicotte, Philippe Brodeur, Émilie Paquin, Pascal Sirois*
10:40	IOS_193	Otolith strontium isotopes elucidate diverse life histories in fishes of the San Francisco Estuary	Levi S. Lewis* , Malte Willmes, Leticia Cavole, James Hobbs
11:00		COFFEE BREAK	



11:20 Keynote Conference by Dr. Anna Sturrock

Presenter: Dianne Tracey

Time	Code	Title	Authors
12:10	IOS_074	Should I stay or should I go: Resident flounder in an Arctic lake inferred by otolith chemistry and genetics	Susanne E. Tanner* , Thais Ferreira-Araújo, Petri Kemppainen, Bronwyn M. Gillanders, Paolo Momigliano, Patrick Reis-Santos
12:30	IOS_131	First in-situ measurements of field metabolic rate in wild Atlantic mackerel	Yuan Tian Chou, Bob Marsh, Ewan Hunter, Clive Trueman*
12:50	IOS_205	Unpacking complexity of longitudinal movement patterns of small-bodied riverine fish using otolith microchemical analyses	Konrad Górski* , Rodrigo Ramírez-Álvarez, Aurélien Vivancos, Daniel Ruzzante, Evelyn Habit
13:10		LUNCH TIME	

Sagitta room

THEME: Life history, demography and connectivity studies

Moderators: David Secor & Konrad Górski

Time	Code	Title	Authors
14:20	IOS_189	Tracking Galapagos sailfin grouper using otolith chemistry	Solange Andrade-Vera* , Jose Marin Jarrin, Malte Willmes, Leticia Cavole
14:40	IOS_030	Novel scale chemistry of <i>Salmo salar</i> L	Michelle von Ehr* , Yvette Heimbrand
15:00	IOS_063	Hatchery-reared Coho Salmon develop less vateritic otoliths in tanks with alternating water flow direction	Leigh Gaffney* , Micah Quindazzi, Emma Polard, Lydia Walton, Zoe Molder, Francis Juanes
15:20	IOS_143	Reconstructing spatial production patterns of salmon in large Alaska watersheds	Ben Makhoul* , Daniel Schindler, Tim Cline, Lisa Seeb, Liz Lee, Diego Fernandez
15:40	IOS_178	Natal Origins & Population Structure of a Recolonizing Salmon Population	Lauren G. Hitt* , Malte Willmes, Mackenzie C. Miner, George E. Whitman, Rachel Johnson, Dennis E. Cocherell, Nann A. Fanguie, Andrew L. Rypel
16:00	IOS_082	Moving matters: Growth implications of movement and environmental variation for a potamodromous fish	Joshua Barrow* , Jian Yen, John Koehn, Brenton Zampatti, Ben Fanson, Jason Thiem, Zeb Tonkin, Wayne Koster, Gavin Butler, Ryan Woods, Steven Brooks, Arron Strawbridge, John Morrongiello
16:20		COFFEE BREAK	

THEME: Life history, demography and connectivity studies

Moderators: Guido Plaza & Francisco Cerna

Time	Code	Title	Authors
16:40	IOS_095	Utilizing alizarin red S in multi coding of three different strains of brown trout stocked in Lake Inari, Finland	Sami Vesala* , Teuvo Niva, Nico Alioravainen, Sari Raineva
17:00	IOS_032	Cataloguing otoliths of mesopelagic and bathypelagic fishes: a tool for species identification	Lydia Walton* , Micah Quindazzi, Catherine Stevens
17:20	IOS_256	Creation of a publicly available known-age fish structure repository	Martin Hamel* , Dave Buckmeier, Jeff Koch, Mark Pegg
17:40	IOS_041	Where is the first «winter» ring? Validating otolith ring formation of juvenile European plaice <i>Pleuronectes platessa</i>	Uwe Krumme*

THURSDAY 12TH OCTOBER 2023

THEME: Life history, demography and connectivity studies

Moderators: Mauricio Landaeta & Arild Folkvord

Time	Code	Title	Authors
10:00	IOS_005	Diversity in larval origin, nursery habitat suitability and early growth in the southern hake <i>Merluccius australis</i> in NW Patagonia	Audrey M. Darnaude, Maylis Labonne, Félix P. Leiva, Jacques Panfili, Frank Ferraton, Edwin J. Niklitschek*
10:20	IOS_024	Grow slow, die young? Testing the bigger-is-better hypothesis using larval and age-1 capelin (<i>Mallotus villosus</i>) otoliths	Gabrielle Perugini* , Hannah Murphy, Dominique Robert, Maxime Geoffroy
10:40	IOS_226	Daily growth and natal origin of capelin (<i>Mallotus villosus</i>) stock in Icelandic waters	Thassya Christina dos Santos Schmidt* , James Kennedy
11:00		COFFEE BREAK	
 Sagitta room 11:20 Keynote Conference by Dr. Anna Sturrock Presenter: Dianne Tracey			
12:10	IOS_122	Prediction of early life events in Brook Trout (<i>Salvelinus fontinalis</i>) using a combination of otolith microstructure and developmental index	Michael Hayden* , Todd Dubreuil, Jennifer H. Fair, Matthew J. O'Donnell, Benjamin H. Letcher
12:30	IOS_194	The role of moonlight on larval growth of inanga and other fishes	Jeff Shima* , Mark Kaemingk, Conor Neilson, Steve Swearer
12:50	IOS_276	Fast shape changes prior to settlement for a temperate cryptobenthic fish: an approach using geometric morphometrics and otoliths	Frances Páez-Collao; Yanara Figueroa-González, Guido Plaza, Hugo A. Benítez, Mauricio F. Landaeta*
13:10		LUNCH TIME	

THEME: Life history, demography and connectivity studies

Moderators: Allen Andrews & Kotaro Shirai

Time	Code	Title	Authors
14:20	IOS_011	Age validation of Black Rockfish, Copper Rockfish, and Cabezon using secondary ion mass spectrometry (SIMS) to elucidate seasonal patterns in otolith stable oxygen isotopes	Mark Terwilliger* , Leif Rasmuson, Richard Stern
14:40	IOS_010	Bombs and fish – Extending the utility of bomb radiocarbon dating to the post-peak decline	Allen H Andrews* , Francesca Vitale, Yvette Heimbrand, Caroline Welte, Jessica Farley, J Paige Eveson, Kyne Krusic-Golub, Alec R Lackmann, Ryan N Hupfeld, Caroline Durif, Francois Roupsard, Kei Okamoto, Keisuke Satoh, Bryan Lockheed, Jed Macdonald
15:00	IOS_111	Age validation of yellowfin tuna in the Indian Ocean using post bomb radiocarbon chronologies	Patricia Lastra Luque* , Igaratza Fraile, Steven E. Campana, Jessica H. Farley, Kyne Krusic-Golub, Naomi Clear, Paige Eveson, Iraide Artetxe-Arrate, Iker Zudaire, Hilario Murua, Gorka Merino
15:20	IOS_145	Validation of Annual Growth Zone Formation in Gray Triggerfish <i>Balistes capriscus</i> Dorsal Spines, Vertebrae, and Otoliths	Walter D. Rogers* , Jennifer C. Potts, Troy C. Rezek, Amanda R. Rezek
15:40	IOS_258	Impact of annuli validation in age structure and growth parameters. The case of <i>Trachurus murphyi</i>	Camilo Rodríguez-Valentino* , Francisco Cerna, Lizandro Muñoz, Guillermo Moyano
16:20		COFFEE BREAK	

THEME: **Life history, demography and connectivity studies**

Moderators: Ming-Tsung Chung & Brenton Zampatti

Time	Code	Title	Authors
16:40	IOS_040	Thermal and metabolic histories of inaccessible cephalopods revealed from statolith stable isotopes: a case approach on <i>Sepioteuthis lessoniana</i>	Chun-I Chiang* , Ming-Tsung Chung, Pei-Ling Wang, Jen-Chieh Shiao, Chia-Hui Wang
17:00	IOS_118	Life-history of Atlantic bluefin tuna (<i>Thunnus thynnus</i>) revealed by otolith chemistry	Allen H Andrews* , Francesca Vitale, Yvette Heimbrand, Caroline Welte, Jessica Farley, J Paige Eveson, Kyne Krusic-Golub, Alec R Lackmann, Ryan N Hupfeld, Caroline Durif, Francois Rounsard, Kei Okamoto, Keisuke Satoh, Bryan Lockhead, Jed Macdonald
17:20	IOS_103	Using otolith $87\text{Sr}/86\text{Sr}$ to determine fish provenance and migration history across a large river basin: approaches, management utility and future considerations	Brenton Zampatti* , Benjamin Fanson, Lee Baumgartner, Gavin Butler, Steven Brooks, David Crook, Katherine Doyle, Alison King, Wayne Koster, Roland Maas, Aleksey Sadokov, Peter Scott, Arron Strawbridge, Jason Thiem, Zeb Tonkin, Phillipa Wilson, Jon Woodhead, Ryan Woods
17:40	IOS_097	Crystalline Polymorphs Of Otoliths In Three Indian Freshwater Fishes From The River Ganga.	Lubna Yasmeen, Mohd Sadiq, Mohd Hammad, Ameer Hamza, Begum Razia Nargis, Mohammad Afzal Khan*
20:00		BANQUET	

FRIDAY 13TH OCTOBER 2023

THEME: **Life history, demography and connectivity studies**

Moderators: Erlend Mokness & Benjamin Walther

Time	Code	Title	Authors
09:10	IOS_075	Combining multiple tissues to unravel estuarine habitat use in a euryhaline fish	Benjamin D. Walther* , Ethan J. Taulbee, Louisa E. Torrance
09:30	IOS_108	Importance of estuaries for the horse-eye jack (<i>Caranx latus</i>) in northeast Brazil	Júlio Guazzelli Gonzalez* , Thierry Frédou, Paulo José Duarte-Neto, Maylis Labonne, Audrey M. Darnaude
09:50	IOS_217	Tracking migration routes of juvenile chum salmon using otolith intrinsic tracer	Yuxiao Gou* , Tomihiko Higuchi, Kotaro Shirai, Kentaro Honda, Takatoshi Higuchi, Takaaki K. Abe, Takashi Kitagawa
10:10	IOS_033	Where deep-sea fish live and grow - Tracking life history patterns of Pacific grenadier (<i>Coryphaenoides acrolepis</i>) with otolith microchemistry	Adrian Castillo* , Leticia M. Cavole, Allen H. Andrews, Octavio Aburto-Oropeza, Chris J. Russo
10:30		COFFEE BREAK	



10:50 Keynote Conference by Dr. Edwin Niklitschek

Presenter: David Secor

Moderators: Erlend Mokness & Benjamin Walther

Time	Code	Title	Authors
11:40	IOS_012	Can otolith macrostructures be used to reconstruct individual maturity and spawning?	Côme Denechaud* , Szymon Smoliński, Jane Godiksen, Audrey Geffen
12:00	IOS_072	Blue Belt programme – Preliminary results on age-based life-history traits of four species from Ascension Island	Valerio Visconti* , Ian Woodgate, Suzy End, Maura Smith, Tiffany Simpson, Paul Whomersley
12:20	IOS_093	Can otolith transition zones benefit the management of exploited fisheries? A New Zealand fishery example	Thomas Barnes* , Matthew Dunn, Peter Horn, Caoimhghin Ó Maolagáin, Keren Spong
12:40	IOS_107	Identification of otolith chemical marking and implications for age determination of European eel (<i>Anguilla anguilla</i>)	Rickard Yngwe* , Jennie Strömquist, Malin Hällbom, Yvette Heimbrand
13:00	IOS_091	Evaluating otolith increment deposition rates in bigeye tuna (<i>Thunnus obesus</i>) and yellowfin tuna (<i>T. albacares</i>) tagged in the Atlantic Ocean	Kyne Krusic-Golub* , Lisa Ailloud
13:20		LUNCH TIME	

THEME: Evolutionary, biological and biogeographic characteristics

Moderators: Antoni Lombarte & Thomas Barnes

Time	Code	Title	Authors
14:40	IOS_221	Paleoichthyology on the isthmus of Panama	Brigida De Gracia* , Aaron O'Dea
15:00	IOS_271	Evolutionary morphology of the saccular otolith at a large phylogenetic scale	Arthur Van Damme* , Victor M. Tuset, Bruno Frédérick, Ricardo Betancur, Effrosyni Fatira, Tanja Schulz-Mirbach, Aline Paiva M. de Medeiros, Eric Parmentier, Antoni Lombarte
15:20	IOS_027	Paleoecology, and diversification pattern of fishes and cephalopods in Mesozoic epicontinental seas based on otoliths and statoliths	Maciej Pindakiewicz*
15:40	IOS_185	The Cenozoic collapse of the West Tethyan biodiversity hotspot: a test using the fish otolith fossil record	Hadeel Saad* , Matt Friedman
16:00		COFFEE BREAK	

THEME: Life history, demography and connectivity studies (Review)

Moderator: Erlend Moksness

Time	Code	Title	Authors
16:20	IOS_162	What can one otolith tell you? Moving otolith science's storyline from research to application	David Secor*
16:40	IOS_001	Age determinations and insights at the scale of centuries	Steven Campana*
17:00		CLOSING CEREMONY	

FRIDAY 13TH OCTOBER 2023

THEME: **Key aspects in otolith and calcified tissues formation and composition**

Moderators: Szymon Smoliński & Dianne Tracey

Time	Code	Title	Authors
09:10	IOS_053	Limited evidence for species-specific influence on temperature-dependent sensitivity of oxygen stable isotope fractionation in biominerals: a meta-analysis	Olivier Morissette* , Clive Trueman, Anna Sturrock, Audrey Geffen, Kotaro Shirai
09:30	IOS_058	4D tomography sheds light on how shape variation leads to differences in otolith motion patterns in three catfish species	Isabelle P. Maiditsch* , Christian M. Schlepütz, Qianwei Qu, Friedrich Ladich, Martin Heß, Tanja Schulz-Mirbach
09:50	IOS_101	Environmental conditions affect otolith annual increment visibility – a long-term perspective from two Atlantic cod populations	Szymon Smoliński* , Côme Denechaud, Audrey J. Geffen, Jane A. Godiksen
10:30		COFFEE BREAK	



10:50 Keynote Conference by Dr. Edwin Niklitschek

Presenter: David Secor

THEME: **Key aspects in otolith and calcified tissues formation and composition**

Moderators: Karin Hüsey & Paulo Duarte-Neto

Time	Code	Title	Authors
11:40	IOS_175	A universal metabolic proxy from bone and ear stone	Chi-Yuan Hsieh* , Zhu-Yen Liu, Kotaro Shirai, Yung-Che Tseng, Chien-Hsiang Lin, Pei-Ling Wang, Ming-Tsung Chung
12:00	IOS_144	Metabolic adjustment of fish in an acidified environment: an evaluation using otolith $\delta^{13}C$ and $\delta^{11}B$ values	Ming-Tsung Chung* , Tzu-Yen Liu, Chi-Yuan Hsieh, Yung-Che Tseng, Kuo-Fang Huang
12:20	IOS_104	Coupling otolith and archival tag records to test assumptions underpinning otolith chemistry applications in wild fish	Karin Hüsey* , Stefanie Haase, Anna M. Sturrock
12:40	IOS_245	Eco-densitometry of fish otoliths: advances and perspectives in computerized micro-CT analysis of sagittal otoliths for tropical fish species	Paulo Duarte-Neto* , Jonas Vasconcelos-Filho, João Valério, Borko Stosic, Wilson Rosa Júnior, Antonio Antonino, Daniel Duarte, Rosangela Lessa, Francisco Santana, Beatrice Ferreira
13:00	IOS_260	Scratching the surface: high resolution elemental maps of fish biominerals	John A. Mohan* , Benjamin LaFreniere, Leonardo Edmondson, Michelle Passerotti, Alicia Cruz-Urbe
13:20		LUNCH TIME	

Posters

THEME I:

KEY ASPECTS IN OTOLITH AND CALCIFIED TISSUES FORMATION AND COMPOSITION

IOS_021 A rapid technique for otolith removal from dried seahorses *Hippocampus ingens*.

Sonia Valle Rubio*, Analucía Alarco

IOS_028 The forgotten element: why do we ignore calcium?

Karin E. Limburg*, Yvette Heimbrand, Karin Hüsey, Martina Blass, Jay Thomas, Tomas Naeraa

IOS_042 Age validation of juvenile European flounder *Platichthys flesus*.

Uwe Krumme*

IOS_059 Can marine multi-stressors make you deaf?

Isabelle P. Maiditsch*, Karin E. Limburg, Tanja Schulz-Mirbach

IOS_068 Compared analysis of 2D and 3D otolith shape for mainly commercial species (flatfish and roundfish) in the Eastern Channel and the North Sea.

Nicolas Andrialovanirina*, Aurélie Mateos, Émilie Poisson Caillault, Sébastien Couette, Kirsteen MacKenzie, Rémi Laffont, Kélig Mahé

IOS_077 3D Otoliths models by microphotogrammetry.

Lizandro Muñoz*, Luis Cid

IOS_087 Prevalence of vateritic otoliths in hatchery-reared Coho Salmon varies with hatchery facility.

Leigh Gaffney, Micah Quindazzi, **Chloe Kraemer***, Emma Polard, Lydia Walton, Francis Juanes

IOS_088 Otolith mineralogy affects otolith shape asymmetry: a comparison of hatchery and natural origin Coho Salmon.

Micah Quindazzi, Leigh Gaffney, **Emma Polard***, Nick Bohlender, Will Duguid, Francis Juanes

IOS_097 Crystalline Polymorphs Of Otoliths In Three Indian Freshwater Fishes From The River Ganga.

Lubna Yasmeen, Mohd Sadiq, Mohd Hammad, Ameer Hamza, Begum Razia Nargis, **Mohammad Afzal Khan***

IOS_116 Automated 3D Otolith Morphometrics.

Francis Juanes*, Micah J. Quindazzi, Adam P. Summers

IOS_120 Comparison of two conventional and one novel otolith chemical age determination method of flounder (*Platichthys spp*) in the Baltic Sea.

Martina Blass, Yvette Heimbrand, Jan-Erik Johansson, **Marju Kaljuste***, Uwe Krumme, Karin Limburg, Zuzanna Mirny, Melvin Samson, Didzis Ustups, Sami Vesala, Peter Vingaard Larsen & Dace Zilniece

IOS_136 Comparative studies on stable carbon and nitrogen isotope values among tissues and hard structures in bony fishes.

Li-Ling Kao*, Mu-Ting Lee, Pei-Ling Wang, Ming-Tsung Chung

IOS_169 Comparison of traditional and otolith chemical age determination methods for eastern Baltic cod (*Gadus morhua*).

Yvette Heimbrand*, Rajlie Sjöberg, Peter Johannessen, Axel Hjelm, Karin Limburg

IOS_186 Strontium uptake and expulsion in otoliths: A case study of Greenland Halibut (*Reinhardtius hippoglossoides*) assessing element marking, otolith growth and tag-recapture studies within natural environment.

Tracey Loewen*, Margaret Treble, Rick Wastle, James Reist, Ravinder Sidhu, Kaj Sünksen, Ole A. Jørgensen, Norman Hallden

IOS_187 Otolith's microchemistry as a tool for identification of (*Acanthocybium solandri*) in Atlantic Ocean.

Thays Freitas de Andrade, **Guelson Silva***

IOS_229 Wavelength dispersion X-Ray Fluorescence (WDFRX) applied to Sr:Ca and Ba:Ca determination in otoliths.

Igor Morais, Marcos Scapin, **Juliana Azevedo***

IOS_248 Higher CN ratio of collagen in the vertebral centrum during juvenile stage in Japanese flounder (*Paralichthys olivaceus*).
Hiromitsu Kamauchi*, Yoshikazu Kato, Hiroyuki Togashi, Yutaka Kurita, Yosuke Amano, Chikage Yoshimizu, Ichiro Tayasu

IOS_250 Heterogeneity of otolith chemical composition from 2D mapping: relationship with biomineralization mechanisms and implications for microchemistry analyses.
Hélène de Pontual, Kirsteen M. MacKenzie, Hélène Tabouret, Françoise Daverat, Kelig Mahé, Christophe Pecheyran, **Karin Hüsey***

IOS_259 Characterization of phosphorous uptake in otoliths using laser-ablation ICP-MS and transmission electron microscopy.
Maria Hussain*, Sierra Schlieff, Michael Schindler, Kirstin Brink

IOS_262 Diet effects on tissue-diet fractionation (TDF) factors of stable nitrogen and carbon isotopes in muscle, heart and otolith organic matter.
Jane Godiksen*, Chung MT, Irgens C, Grønkjær P.

THEME II: EVOLUTIONARY, BIOLOGICAL AND BIOGEOGRAPHIC CHARACTERISTICS

IOS_026 Otolith-based ichthyofauna from Cassian Formation (Carnian), Northern Italy.
Maciej Pindakiewicz*

IOS_055 Advantages of the online tools (AFORO) in otolith descriptions of recent first citations in the Mediterranean Sea found in fisheries continuous monitoring (ICAT-MAR).
Antoni Lombarte*

IOS_057 Twenty years of AFORO. New developments and connections to contribute otolith research.
Amalia Manjabacas, Òscar Chic, Emili García-Ladona, Víctor Manuel Tuset, Pere Martí, Josep Forest, **Antoni Lombarte***

IOS_062 Correcting incorrect identifications.
Bradley Moore, Jason Hamill, Alan Hart, Richard Saunders, **Keren Spog***, Gretchen Skea

IOS_168 Consistent growth rates and recruitment failure of Namibian West coast steenbras, an over-exploited Sparid confirmed with otoliths, length-frequency-analysis and tag-and-recapture data.
Margit Wilhelm*, Arariy Shikongo, Angelika Veii, Ralf Schwamborn

IOS_218 Otolith from the deep sea, the case of *Argyrolepelecus hemigymnus* (Cocco, 1829) from the Strait of Messina (Central Mediterranean Sea).
Marco Albano, Claudio D'Iglio, Giovanni Lanteri, Sergio Famulari, Nunziacarla Spanò, Serena Savoca, **Gioele Capillo***

IOS_220 Intra-specific variability of the saccular, utricular and lagenar otoliths of the garfish *Belone belone* (Linnaeus, 1760) from South-Western Ionian Sea (Central Mediterranean Sea).
Marco Albano*, Gioele Capillo, Claudio D'Iglio, Sergio Famulari, Nunziacarla Spanò, Serena Savoca

IOS_223 Morphometry of the Sagittae of the Deep-Sea Grenadiers Collected on the Brazilian Continental Slope (*Macrouridae: Gadiformes*).
César Santificetur*, Guilherme R. de Faria, Julia Yumi Ibanhez, Marcelo R. S. Melo

IOS_230 Morphometric analysis of otoliths lapillus in *Arius proops* (Siluriformes, Ariidae) from a macrotidal estuary in Brazil.
Juliana Azevedo*, Bruno Marassi, Larissa Miranda, Elisabete Braga

IOS_237 Otolith perimeter as a tool in the identification of coexisting species of silversides in Argentina.
Santiago Morawicki, Patricio Solimano, Gustavo Thompson, **Alejandra Volpedo***

IOS_267 Otolith shape suggests high plasticity at range edge of *Stellifer naso* (Acanthuriformes: Sciaenidae) on the eastern Brazilian coast.
Jonas Santos*, Rafael Menezes, Marcelo Britto

THEME III:

LIFE HISTORY, DEMOGRAPHY AND CONNECTIVITY STUDIES

IOS_007 SmartDots a new tool for age reading exchanges; but is it “smart” to use digital images?

Florian Berg*, Côme Denechaud

IOS_016 Relationship between habitat use and condition of European eel (*Anguilla anguilla*) in small estuaries of the eastern English Channel.

Jérémy Denis, Kélig Mahé, Hélène Tabouret, Khalef Rabh, Kévin Boutin, Mamadou Diop, **Rachid Amara***

IOS_017 Escaping the black box: explicit annotation of otolith growth rings with deep learning.

Troels A. Bojesen, **Côme Denechaud***, Ketil Malde

IOS_037 Migrations of Ariid Catfishes in the Mekong River.

An Vi Vu*, Lee J. Baumgartner, Martin Mallen-Cooper, Julia A. Howitt, Gregory S. Doran, Karin E. Limburg, Bronwyn M. Gillanders, Cameron M. Kewish, Julianne Reinhardt, Ian G. Cowx

IOS_039 Updating the growth parameters of the Whitemouth croaker, *Micropogonias furnieri* (Desmarest 1823), in the Southwestern Atlantic.

Daniele Costa Batalha, Estevan Luiz da Silveira, Antônio Olinto Ávila-da-Silva, **Andres Vaz-dos Santos***

IOS_046 Can New Zealand White shark be aged using a microCT based vertebral animation?

Brittany Finucci, Caoimhghin Ó Maola-gáin, **Thomas Barnes***

IOS_049 Using otolith strontium isotopes to assess portfolio effects in Californian Chinook salmon.

Kohma Arai*, Anna Sturrock, Malte Willmes, George Whitman, Mikaela Provost, Carson Jeffres, Rachel Johnson

IOS_065 Simple non-destructive method of individual cohort determination of young Barents Sea cod for condition analyses.

Arild Folkvord*, Julie Skadal, Christian Irgens, Øyvind Langnes, Elena Eriksen

IOS_070 Pattern for otoliths readings of *Chloroscombrus chrysurus* in the South-eastern Brazilian Bight.

Kathleen Angélica Rautenberg, Eduardo Luis Cupertino Ballester, Dimitris Politikos, Paulo Ricardo Schwingel, **André Vaz-dos Santos***

IOS_079 Insights from tetracycline-marked otoliths of Baltic Sea flounder stored for over 40 years.

Dace Zilniece*, Tatjana Baranova, Didzis Ustups, Maris Vitins

IOS_081 Investigating *Aphanopus spp.* in the Atlantic waters using otolith contour: converging population hypotheses.

Joana Vasconcelos, José Luis Otero-Ferrer, Alba Jurado-Ruzafa, Antoni Lombarte, Carlos Hernández-González, Mafalda Freitas, **Víctor M. Tuset***

IOS_083 Life history chronology of anadromous Coregoninae fishes of subsistence harvest importance in Arctic Alaska.

Kevin Fraley*, Jason C. Leppi, Randy J. Brown

IOS_085 Anchoveta *Engraulis ringens* along the Chilean coast: Management units, demographic units and water masses: Insights from multiple otolith-based approaches.

Cristóbal Garcés*, Edwin J Niklitschek, Guido Plaza, Francisco Cerna, Mathieu Leisen, Pamela Toledo, Fernando Barra

IOS_089 Age, growth and mortality of the striped seabream *Lithognathus mormyrus* (Linnaeus, 1758) from central coasts of Algeria (Mediterranean Sea).

Nadjette Bourehail*

IOS_100 Near-infrared spectroscopy of otoliths in the discrimination of the Baltic herring stock components.

Karolina Jonko-Sobuś, **Szymon Smoliński***, Marina De Gea Neves

IOS_102 Micro-X-ray fluorescence image analysis of otoliths to distinguish wild-born and stocked whitefish in the Baltic Sea.

Viktor Finnäs*, Jan-Olof Lill, Timo Saari-nen, Christer Lindqvist, Yvette Heimbrand, Erkki Jokikokko, Henry Hägerstrand

- IOS_106** Validating true winter zones in European eel (*Anguilla anguilla*) otoliths, using oxygen isotopes.
Rickard Yngwe*, Jennie Strömquist, Malin Hällbom, Yvette Heimbrand
- IOS_109** The use of otolith ageing and microchemistry to disentangle European hake connectivity and its application to understand its recruitment dynamics.
Sílvia Pérez-Mayol*, Mariña Fabeiro, Ignacio A. Catalán, Sonia Rábade, Beatriz-Morales-Nin, Fran Saborido-Rey
- IOS_112** Biphase versus monophasic growth curve equation, an application to common sole in the northern and central Adriatic Sea.
Francesco Masnadi, Pierluigi Carbonara, Fortunata Donato, **Laura Sabatini***, Giulio Pellini, Massimiliano Cardinale, Giuseppe Scarcella
- IOS_115** Otolith shape analysis as an effective tool for stock identification of two commercially important marine fishes, *Helicolenus dactylopterus* and *Merluccius merluccius*, in the Northeast Atlantic and the Mediterranean.
Ana Vaz, Milene Alexandra Guerreiro, Jorge Landa, Ioannis Thasitis, Hannipoula Olsen, Giuseppe Scarcella, Laura Sabatini, Sergio Vitale, Estanis Mugerza, Kélig Mahé, Patrick Reis-Santos, **Susanne Tanner***, Christoph Stransky, Miguel Pardal, Filipe Martinho
- IOS_119** Comparing shape R packages using wavelet functions for connecting fish populations.
Joana Vasconcelos, José Luís Otero-Ferrer, Alba Jurado-Ruzafa, Amalia Manjabacas, **Víctor M. Tuset***, Antoni Lombarte
- IOS_121** Reconstructing juvenile common snook ontogenetic movement in estuaries of the Abrolhos Bank using otolith chemistry.
Marcelo Soeth, Mauricio Hostim-Silva, Mario Vinicius Condini, **Felippe Daros***
- IOS_124** Can otolith microchemistry and morphometry be used jointly to enhance the prediction of Atlantic salmon (*Salmo salar*) origins?
Anthony Fontaine*, Hugo Gallier, Matthias Vignon, Hélène Tabouret, Gilles Bareille
- IOS_132** Otolith trace elemental discrimination between Baltic cod (*Gadus morhua*) ecotypes.
Yvette Heimbrand*, Karin Limburg
- IOS_134** Otolith microchemistry as a tool to analyse the recruitment of coastal northern pike (*Esox lucius*).
Roland Svirgsden*, Mehdi Rohtla, Lagle Matetski, Mari-Liis Põlme, Jürgen Karvak, Markus Vetemaa.
- IOS_140** Validation of annual periodicity in otoliths of European anchovy (*Engraulis encrasicolus*) in the Gulf of Cadiz (Western Iberian Peninsula).
Carmen Hernández*, Clara Dueñas-Liaño, Jorge Tornero, Jorge Landa, Fernando Ramos.
- IOS_141** Age determination of Atlantic horse mackerel (*Trachurus trachurus*) in Western stock using otoliths.
Carmen Hernández*, Clara Dueñas-Liaño, Jorge Landa
- IOS_142** Using otolith shape indices for a quick-easy diagnostic of *Opisthonema oglinum* geographic variation.
André Vaz-dos-Santos*, Kathleen Angelica Rautenberg, Cristiane Gallego Augusto, Eduardo Luis Cupertino Ballester, Paulo Ricardo Schwingel, Alberto Teodorico Correia
- IOS_158** Modelling the growth of Chilean jack mackerel (*Trachurus murphyi*) considering the effect of age-specific sample size.
Lilian Cisterna*, Sebastián I. Vásquez, Aquiles Sepúlveda, Evelyn Sanhueza
- IOS_159** Connectivity between the Saguenay Fjord and the St. Lawrence Estuary (Canada) of groundfish populations exploited by a winter recreational fishery.
Rachel Mailhot*, Dominique Robert, Pascal Sirois
- IOS_160** Coastal upwelling influences population structure of dusky grouper: an integrative approach based on otolith chemistry and muscle stable isotopes.
Cristiano Albuquerque*, Mario Condini, Susanne Tanner, Patrick Reis-Santos, Tatiana Saint-Pierre, Elisa Seyboth, Bianca Possamai, David Hoeinghaus, Alexandre Garcia

- IOS_161** Age and growth from daily microstructures in otoliths of the Jaguar guapote, *Parachromis managuensis* (Günther, 1867), a fish introduced in the Brazilian semi-arid region.
Amanda Resende, **Francisco Santana da Silva***, Rosângela Lessa
- IOS_164** Habitat use plasticity by the dog snapper (*Lutjanus jocu*) across the Abrolhos Bank shelf, eastern Brazil, inferred from otolith chemistry.
Rafael Menezes, Perimar E.S. Moura, Alexandre C.A. Santos, Leonardo E. Moraes, Mario V. Condini, Ricardo S. Rosa, **Cristiano Albuquerque***
- IOS_165** Mixed stocks of the dog snapper (*Lutjanus jocu*) along the northeast region of Brazil revealed by otolith shape analysis.
Rafael Menezes, Rosângela P.T. Lessa, Ricardo S. Rosa, Leonardo E. Moraes, Ronaldo B. Francini-Filho, **Cristiano Albuquerque***
- IOS_171** Size-age variation of otolith morphology of *Chloroscombrus chrysurus* Linnaeus 1766 in the Southwestern Atlantic.
Ana Cláudia Rojas de Souza, Estevan Luiz da Silveira, Antônio Olinto Ávila-da-Silva, **André Vaz-dos-Santos***
- IOS_180** Some aspects on the life history of the Bali sardine in Southeastern Luzon, Philippines.
Kaola Alezandra Pamonag*, Kim P. Nuñez, Alexanra Bagarinao-Regalado, Wilfredo L. Campos
- IOS_183** A comparison of seasonal early life growth in *Sardinella gibbosa* from the Visayan Sea, Philippines.
Raphael De la Rosa*, Wilfredo Campos, Alexanra Bagarinao-Regalado, Luke Felix, Marivic Pepino
- IOS_198** Age and growth of the blue shark in the Southwest Atlantic.
Francisco Santana da Silva*, Santiago Montealegre-Quijano, Fabrice Duponchelle, Rodrigo Risi Pereira Barreto, Jacques Panfili and Rosângela Lessa
- IOS_200** Unveiling the role of the NW Patagonian Fjords as a refuge for the persistence of fish populations in the face of disturbances.
Pamela Toledo*, Edwin Niklitschek, Cristóbal Garcés, Ximena Valenzuela
- IOS_204** Mapping the environmental strontium isotopic ratio in South America to reveal the life history of freshwater fishes.
Esteban Avigliano*, Ming-Tsung Chung, Marc Pouilly, Kuo-Fang Huang, Miguel Casalinuovo†, Jael Dominino, Natalia Silva, Sebastian Sánchez, Juan F. Facetti, Cristhian Clavijo, Jorge Pisonero, Ana Méndez, Pablo Scarabotti, J. D. Caffetti, A. V. Volpedo
- IOS_208** Age and growth of the Acoupa Weakfish, *Cynoscion acoupa* of the Brazilian Amazonian Coast, through micro and macrostructures in otoliths.
Zafira da Silva Almeida(in memorian), Cícero Diogo Lins de Oliveira, Amanda Grazielle Araújo Resende, Antônio Carlos Leal de Castro and Rosângela Lessa, **Francisco Santana Da Silva***
- IOS_213** Interannual and between-sex variability of growth parameters of southern blue whiting *Micromesistius australis* in the breeding area south of the Malvinas Islands.
Cecilia Diamela Alvarez, **Natalia Ruocco***
- IOS_228** Habitat use of the common snook *Centropomus undecimalis* in lagoon systems of the southwest Atlantic Ocean inferred by otolith core and edge elemental signatures.
Paulo Almeida, Marcus Costa, Rebeca Coutinho, Ana Mendez, Jorge Castro, Cassiano Monteiro-Neto & **Alberto Teodorico Correia***
- IOS_236** Eco-morphology of sagittal otoliths in five Macrouridae species from Central Mediterranean Sea.
Serena Savoca*, Claudio D'Iglio, Marco Albano, Sergio Famulari, Nunziacarla Spanò, Gieele Capillo
- IOS_240** *Mugil liza* as sentinel's species in Southeast-South America aquatic ecosystems
Rafael Schroeder, Esteban Avigliano, Alejandra V. Volpedo, Roberta Callicó Fortunato, Pedro Barrulas, Felipe A. Daros, Paulo R. Schwingel, Martin C. Dias & **Alberto T. Correia***

- IOS_243** Variability in early life growth of the goldstripe sardinella, *Sardinella gibbosa*, in the Visayan Sea and the role of environmental factors.
Alexandra Regalado*, Wilfredo L. Campos, Raphael de la Rosa, Kaola T. Pamonag, Renmill Lambid and Rhyxy Mamon
- IOS_244** Not only sagittae: evaluation of intra-specific differences of lapilli and asterisci of *Scorpaena porcus* (Linnaeus, 1758) from the Strait of Messina (Italy – Central Mediterranean Sea).
Sergio Famulari*, Claudio D'Igli, Marco Albano, Serena Savoca, Nunziacarla Spanò, Josipa Ferri, Gioele Capillo
- IOS_246** Subpopulational structure of *Pogonias courbina* in two lagoon systems in Southwest Atlantic Ocean inferred by shape and elemental signatures of otoliths.
Paulo Almeida, Marcus Costa, Ana Ribeiro, Agostinho Almeida, Rui Azevedo, Cassiano Monteiro-Neto & **Alberto Teodorico Correia***
- IOS_249** Segmental isotope analysis of the vertebral centrum reveals the spatiotemporal population structure of adult Japanese flounder *Paralichthys olivaceus* in Sendai Bay, Japan.
Yoshikazu Kato, Hiroyuki Togashi, Yutaka Kurita, Yutaka Osada, Yosuke Amano, Chikage Yoshimizu, **Hiromitsu Kamauchi***, Ichiro Tayasu
- IOS_253** Life-history Traits of Twaite Shad (*Alosa fallax*) in the Scheldt Estuary.
Karen Bekaert*, Giuliano Lecompte, Raf Vanneste, Pieterjan Verhelst
- IOS_254** Larval growth and mortality rates of *Engraulis ringens* in Northern Chile.
Miguel Araya*, Jessica Peñailillo, Carlos Pacheco
- IOS_268** Determination of age and growth in fish of the Pacific Promfet (*Brama Australis*) in South Central and Southern Chile.
Guillermo Moyano Altamirano, **Jorge Contreras***
- IOS_269** Microstructural characteristics of the sagitta otolith of the common eel, *Ophichthus remiger*, from northern Peru.
Luis Usca*
- IOS_270** Characterization of the otolith microstructure and description of growth in juveniles of *Merluccius gayi peruanus*.
Sandra Obando*, Jorge Mostacero
- IOS_273** Fitness metrics for migratory and resident Delta Smelt.
Leticia Cavole*, Bruce G Hammock, Tomofumi Kurobe, Swee J. Teh, Malte Willmes, Christian Denney, James Hobbs, Brian Mahardja, Andrew Schultz, Levi S. Lewis
- IOS_274** Age analysis of hoki (*Macruronus magellanicus* Lönnberg, 1907) from the Chilean coast, using sagittae otoliths, with emphasis on the description of growth rings.
Héctor Hidalgo*
- IOS_275** Corroborating otolith age using oxygen isotopes and comparing outcomes to scale age: Consequences for estimation of growth and reference points in northern pike (*Esox lucius*).
Timo Rittweg*, Clive Trueman, Elias Ehrlich, Michael Wiedenbeck, Robert Arlinghaus
- IOS_278** First attempt to age the coldwater coral *Desmophyllum dianthus*
Rafaella Mella*, Guido Plaza, Juan Pablo Espinoza, Darinka Andrea Pecarevic
- IOS_279** Interannual changes in the otolith shape of the anchoveta (*Engraulis ringens*), as related to changes to Chlorophyll a and SST fluctuations
Valentina Palta*, Guido Plaza, Francisco Cerna
- IOS_280** Age and Growth of newly settled Tripterygiid with bipartite life cycle in Chile
Jose Ágrede-Arango*, Mauricio F. Landaeeta, Guido Plaza, Jorge E. Contreras
- IOS_281** Contrasting growth chronologies of the threefin hake (*Micromesistius australis*) using linear mixed-effects models and a tree-ring based approach (dplR)
Claudeth Asencio*, Guido Plaza, Francisco Cerna

THEME IV:

PAST AND RECENT AQUATIC ECOSYSTEM ECOLOGY AND CLIMATE CHANGE INDICATORS

IOS_043 How does fish behavior influence exposure to environmental mercury or hypoxia?

Jacob Oster, Jessica Myers, Jeremy Conkle, **Benjamin Walther***

IOS_051 Otoliths by the millions: A community resource.

Katherine Maslenikov*, Luke Tornabene, Thomas Helser

IOS_073 Sciaenidae paleoecology of the Castilletes Formation.

Natasha Travenisk Hoff*, Michel Michaelovitch de Mahiques, June Ferraz Dias, Carlos Jaramillo, Orangel Aguilera

IOS_096 Biobank, database and collection of samples in Natural Resources Institute Finland.

Sami Vesala*, Anu Kantola, Oili Tarvainen

IOS_105 Growth and feeding ecology studies on two cephalopod species off southwestern Taiwan waters.

Chia-Hui Wang*, Chun-I Chiang, Pei-Ling Wang, Ming-An Lee

IOS_135 On the growth of goldband snapper (*Pristipomoides multidens*) in the Indo-Pacific.

Júlio Guazzelli Gonzalez*, Clement Z. W. Ng, Muhammad Faiq Bin Mohd Saleh, Corey B. Wakefield, Stephen J. Newman, Ong J. L. Joyce

IOS_156 Trophic Level Comparisons of Archaeological and Modern Cod (*Gadus morhua*) in the Western Atlantic Ocean.

Kenya Ripley Dunlap*, Jessica Lueders-Dumont, India Ingemii, Bess Ward, Daniel Sigman

IOS_188 Morphotypes of fish otoliths presented in marine sediments of the continental slope of the São Paulo state (Brazil).

Natasha Travenisk Hoff*, Beatriz de Castro Siqueira, June Ferraz Dias, Orangel Aguilera, Marcia Caruso Bícigo, Michel Michaelovitch de Mahiques

IOS_190 Otolith collections: a new challenge to Southeastern Brazil.

June Ferraz Dias, Monica Angélica Varela Petti, Renata Ramos Gomes, Raphael Machado Martinelli, **Natasha Travenisk Hoff***, Carolina Siliprandi, Jaermeson Silva Santos Júnior

IOS_206 Archaeological otolith analysis: a tool for understanding past and present fishing practices in the Yucatan Peninsula.

Ariana Solis*, Maribel Badillo Alemán, Alfredo Gallardo Torres, Nayeli Jiménez Cano, Nidiyare Hevia-Montiel, Jorge Pérez González, Emiliano Vásquez Morales, José Antonio Martínez Pérez, Xavier Chiappa-Carrara

IOS_265 Local and global environmental drivers of growth chronologies in a demersal fish in the south-eastern Pacific Ocean.

Guillermo Moyano*, Guido Plaza, Francisco Cerna and Ariel A. Muñoz

IOS_282 Contrasting otolith morphology and age-growth patterns between Holocene and modern populations of *Salilota australis*

Osneider Palomino*, Guido Plaza, Carolina Flores, Jimena Torres

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Notes

A sheet of white paper with horizontal ruling lines. The top half of the page features a faint, repeating pattern of small, light blue fish-like shapes. The bottom half of the page is blank, showing only the horizontal ruling lines.



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October 9-13, 2023

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