



Sclerochronological research: Opportunities and challenges

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This special issue represents a summary and development of the 5th International Sclerochronology Conference (ISC) held in Split, Croatia in June 2019. The conference was organized into eight thematic sessions including Biomineralization; Climate and Oceans: Past, Present and Future; Environmental Biomonitoring and Entrepreneurship; Fisheries Ecology and Management, Growth, Bioenergetics and Ecosystems; Paleoecology and Evolution; Proxy Development: Challenges and opportunities; and Sclerochronology and Human-Environmental Interactions: Past and Present. In total 150 scientists from 26 countries convened to discuss aspects of sclerochronological research, making this meeting the largest sclerochronology conference so far with participants from more countries than ever before.

International Sclerochronology Conferences were initiated in 2007 in St. Petersburg (Florida, USA) and subsequently held as triennial meetings in 2010 in Mainz (Germany), 2013 in Caernarfon (North Wales, UK), and 2016 in Portland (Maine, USA). These conferences provide important frameworks for the progression of sclerochronological research and facilitate the exchange of ideas, establishment of informal and formal networks, as well as planning and preparation of international projects. Special issues resulting from these conferences contain pivotal papers (Oschmann, 2009; Schöne and Gillikin, 2013; Gillikin et al., 2019).

Sclerochronology is an interdisciplinary research field. Over the last fifteen years, scientific committees of ISCs have made considerable efforts to consolidate research approaches and bring together scientists from different disciplines. Sclerochronologists are almost as diverse as their target taxa. They come with different backgrounds including

geology, chemistry, biology, paleontology, archaeology, and numerical modeling, among others. For the generalist coastal scientist, however, an important question is, what is sclerochronology? The term first appeared in the literature 45 years ago, when it was defined by Bud-demeier et al. (1974) in relation to research on coral growth increments. The conference booklet of the 1st ISC contains the most comprehensive definition of the term ‘sclerochronology’, and this definition was subsequently quoted by Oschmann (2009) in his introduction to the related special issue. The definition reads as follows:

“Sclerochronology is the study of physical and chemical variations in the accretionary hard tissues of organisms, and the temporal context in which they formed. Sclerochronology focuses primarily upon growth patterns reflecting annual, monthly, fortnightly, tidal, daily, and sub-daily increments of time entrained by a host of environmental and astronomical pacemakers. Familiar examples include daily banding in reef coral skeletons or annual growth rings in mollusk shells. Sclerochronology is analogous to dendrochronology, the study of annual rings in trees, and equally seeks to deduce organismal life history traits as well as to reconstruct records of environmental and climatic change through space and time.”

One of the aims of the conference held at Split was to attract participation from scientists studying fish and applying sclerochronological methods for the analysis of otoliths. Despite the publication of the comprehensive book, *Manual of Fish Sclerochronology*, almost two decades ago (Panfili et al., 2002), the term sclerochronology is still very rarely used in relation to research conducted on growth patterns in

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