Fundamental questions and applications of sclerochronology: Community-defined research priorities

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ABSTRACT

Horizon scanning is an increasingly common strategy to identify key research needs and frame future agendas in science. Here, we present the results of the first such exercise for the field of sclerochronology, thereby providing an overview of persistent and emergent research questions that should be addressed by future studies. Through online correspondence following the 5th International Sclerochronology Conference in 2019, participants submitted and rated questions that addressed either knowledge gaps or promising applications of sclerochronology. An initial list of 130 questions was compiled based on contributions of conference attendees and reviewed by expert panels formed during the conference. Herein, we present and discuss the 50 questions rated to be of the highest priority, determined through an online survey distributed to sclerochronology community members post the conference. The final list (1) includes important questions related to mechanisms of biological control over biomineralization, (2) highlights state of the art applications of sclerochronological methods and data for solving long-standing questions in other fields such as climate science and ecology, and (3) emphasizes the need for common standards for data management and analysis. Although research priorities are continually reassessed, our list provides a roadmap that can be used to motivate research efforts and advance sclerochronology toward new, and more powerful, applications.

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