

EGU2020-9421

<https://doi.org/10.5194/egusphere-egu2020-9421>

EGU General Assembly 2020

© Author(s) 2022. This work is distributed under the Creative Commons Attribution 4.0 License.



## Next-generation community ecology: Exploring ecological and evolutionary drivers of planktonic foraminifera diversity using the Endless Forams database and a supervised machine learning classifier

Allison Hsiang<sup>1,2</sup> and Pincelli Hull<sup>3</sup>

<sup>1</sup>GeoBio-Center LMU, Ludwig-Maximilians-Universität München, Richard-Wagner-Str. 10, 80333 Munich, Germany

([allison.hsiang@lmu.de](mailto:allison.hsiang@lmu.de))

<sup>2</sup>Department of Earth and Environmental Sciences, Paleontology & Geobiology, Ludwig-Maximilians-Universität München, Richard-Wagner-Str. 10, 80333 Munich, Germany

<sup>3</sup>Department of Geology & Geophysics, Yale University, P.O. Box 208109, New Haven, CT 06520-8109 USA

The rich fossil record of planktonic foraminifera makes them an indispensable group for understanding interactions between climatic, oceanic, and biological dynamics through time and space. Over the past few years, we have been working to provide databases and informatics resources to standardize and speed up the generation of large datasets for community-scale analyses of planktonic foraminifera. Our public database Endless Forams Most Beautiful ([www.endlessforams.org](http://www.endlessforams.org)), which currently contains >34,000 unique images of individual planktonic foraminifera comprising 35 species, is an important new resource for taxonomic training and standardization, supervised machine learning, and large-scale analyses of community ecology and morphological evolution. Here, we present one such application using both the individuals in the Endless Forams database and an additional ~26,000 specimens from across the North Atlantic, identified using a supervised machine learning classifier trained using the Endless Forum data. We combine taxonomic information from these ~60,000 individuals with morphometric measurements extracted using our open source software AutoMorph to explore ecological and evolutionary drivers of modern planktonic foraminifera diversity and size.