

MixONET

**Mixotrophy in the Oceans:
Novel Experimental designs
and Tools for a new trophic
paradigm**

www.mixotroph.org/mixonet

19 members (17 countries):

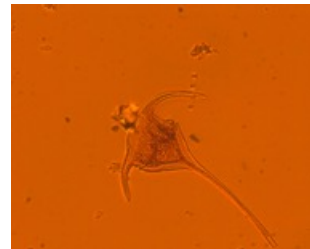
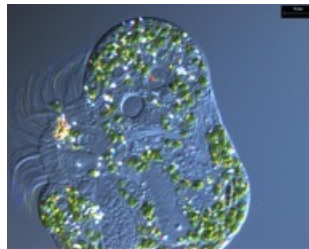
Anukul Buranapratheprat (Thailand), Amany Ismael (Egypt), Áurea Ciotti (Brazil), Ahmed Al-Alawi (Oman), Beatriz Reguera (Spain), Fernando Unrein (Argentina), Hae Jin Jeong (S. Korea), Helga Gomes (USA), KB Padmakumar (India), Koji Suzuki (Japan), Luciana Santoferrara (USA), Maite Maldonado (Canada), Mengmeng Tong (China), Michaela Larsson (Australia), Patricio Diaz (Chile), Robinson Mugo (Kenya), Tina Šilović (France).

SCOR WG 165 (Jan 2022 – Dec 2026)
Chairs: Aditee Mitra & George McManus



The Mixoplankton Paradigm

- With the exception of diatoms and strict heterotrophs, most protist plankton are capable of both phago-trophy and photo-trophy
- The implications of widespread mixotrophy for trophic function have not been adequately explored
- MixONET is focused on bringing the mixoplankton paradigm to researchers, resource managers, policy makers, and educators so that a more realistic understanding of coastal food webs can be used for environmental management and literacy.





Recent MixONET Activities

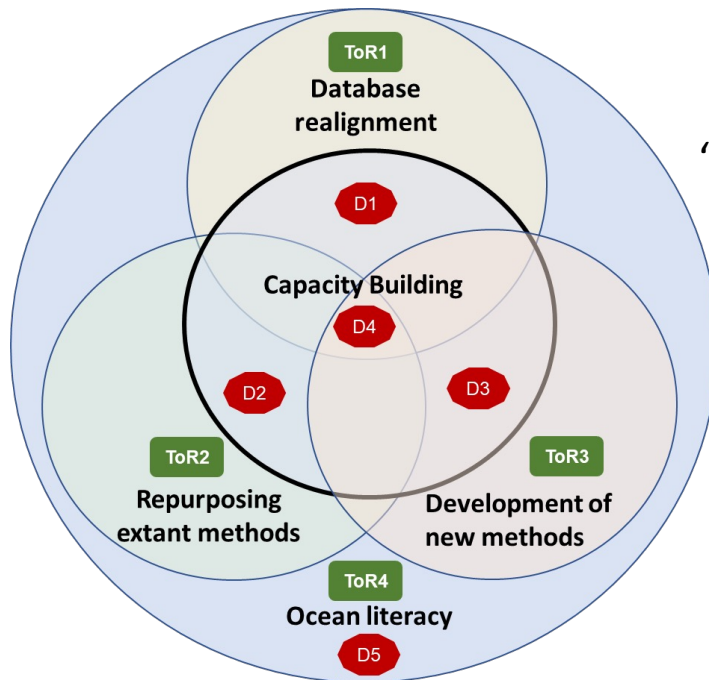


- Periodic virtual meetings
- Planned AGU mixoplankton session in Glasgow, Feb 2026
- Ten publications acknowledging SCOR support, plus 3 in review
- Mixoplankton-themed special section of JPR issue
- May 2025: hybrid meeting in Granada



MixONET ToRs Update

Four Terms of References



ToR 1 Database realignment
'The Mixoplankton Database' {Mitra et al. 2023}

ToRs 2&3 Repurposing extant & developing new methods

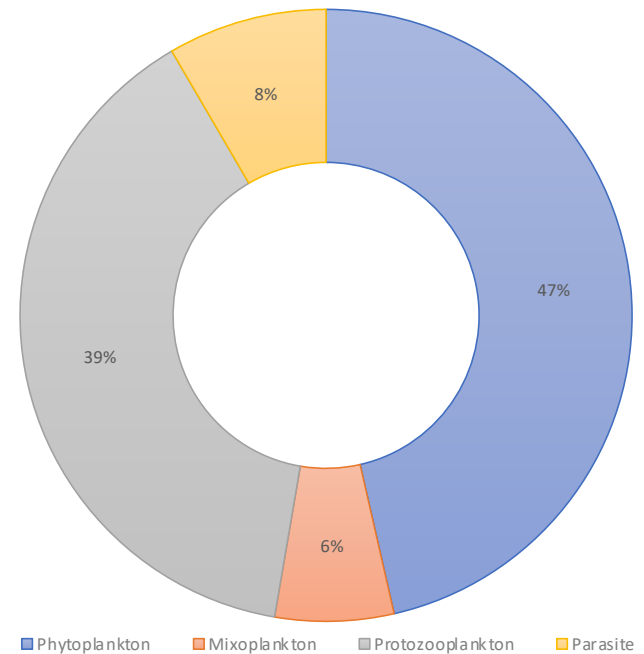
ToR 4 Ocean literacy



Highlights: ToR1 Database Realignment

- Working to incorporate missing mixoplankton into the PR2 database of ribosomal RNA gene sequences based on the Mixoplankton Database (MDB). **Larsson and Santoferrara.**
- The Toxic Algal Species (TAS) Database: a new database which has been developed in reference to the Mixoplankton Database (MDB) **Reguera**
- Regional databases (Australia, Long Island Sound, etc.)

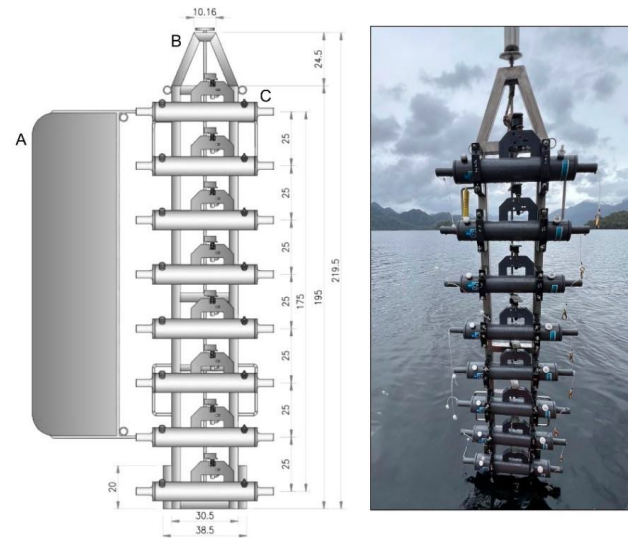
Trophic Strategy by Species in MetaPR2





Highlights: ToRs 2&3 Repurposing extant & developing new methods

- Co-edited special section on mixoplankton for Journal of Plankton Research (2025) **McManus**
- Development of a new instrument to sample mixoplanktonic dinoflagellate blooms on micro-scale (25 cm vertical resolution). **Diaz, Reguera, et al** (2025)
- Novel application of Calcofluor staining in routine quantitative analyses of photosynthetic microplankton. **Reguera** and colleagues (in review)
- Methods protocol manual (in prep)



Fine scale sampler with a vertical resolution of 25 cm. A) A fin providing stability to the structure submerged in water, B) Skeleton of the structure where the C) Eight Niskin bottles of 1.7 L are positioned

Journal of Plankton Research, 2024, 00, 1–2
<https://doi.org/10.1093/plankt/fbae056>
Comment

OXFORD

Journal of Plankton Research, 2025, 47, fbae045
<https://doi.org/10.1093/plankt/fbae045>
Advance access publication date 13 September 2024
Original Article

OXFORD

Mixotrophs and Mixoplankton: Conceptual Integration into Aquatic Research
Introduction to the theme section “Mixotrophs and mixoplankton: conceptual integration into aquatic research”
Susanne Wilken^{1,*} and George McManus²

Mixotrophs and Mixoplankton: Conceptual Integration into Aquatic Research
Quantum efficiency of chloroplasts retained from food by the mixotrophic ciliate *Strombidium rassoulzadegani*
J. Grzywacz¹, M. Gorbunov² and G.B. McManus^{1,*}

MixONET Report - SCOR Annual meeting Oct 2025



Highlights: ToR4 Ocean Literacy

- **Training workshop** Burapha University (Chonburi, Thailand) attended by 16 ECRs, faculty, and researchers. [Mitra and Buranapratheprat]
- **Lectures (2)** on 'Toxic Phytoplankton taxonomy, monitoring and phycotoxins' National University of México in Mazatlán - 50 participants. [Reguera]
- **Plankton Simulator for teaching:** developed for educational purposes including public engagement. Manual will be translated into Thai, Spanish and Chinese (by SCOR wg members). [Mitra]

Mitra, A (2025) Red *Noctiluca* Simulator. Zenodo.
<https://doi.org/105281/zenodo.16933402>

