

Template for Annual SCOR Working Group Reports to SCOR

1. Name of group

WG 150 - Translation of Optical Measurements into particle Content, Aggregation & Transfer (TOMCAT)

2. Activities since previous report to SCOR (e.g., virtual or in-person meetings, email discussions, special sessions). Limit 1000 words

Capacity building – SUMMER school

This item is carrying over from last year owing to delays caused by COVID-19.

Members of TOMCAT are planning to host a 1-week summer school in Cape Town, South Africa. The summer school was originally planned for October 2020, then due to COVID-19 for October 2022. Though we secured a venue and dates for this year, owing to the back-log of project meetings and workshops, we could not find enough volunteers to organize and run the course. Moreover, most of the volunteer teachers would require financial support for travel, which we do not currently have.

The planned focus of the school is capacity building, so the teaching material will be accessible and hands-on with a focus on optical instruments that are affordable (< US\$ 2,000). For example, we will introduce the affordable "PlanktoScope" (<US\$400 in parts), which is of comparable quality to more costly commercial instruments. Therefore, this instrument is a potential chance to allow a low-cost approach to extend imaging approaches in oceanography as well as citizen sciences projects. The anticipated number of students is 20. SCOR has already kindly approved US\$ 5,000 for travel support of developing country scientist to attend the summer school.

If at all possible, we would like to keep trying to put the summer school in place next year, especially now that we have found a suitable venue.

3. Documents published since previous report to SCOR (e.g., peer-reviewed journal articles, reports, Web pages) and should be limited to publications that resulted directly from WG activities and which acknowledge SCOR support

No further publications since last year.

4. Progress toward achieving group's terms of reference. List each term of reference separately and describe progress on each one. Limit 1000 words

TOF:

1. **Review current devices that optically measure particles, and document the capabilities and limitations of each device.**

Achieved.

2. Make vocabularies more transparent and interoperable using international standards.

Some of these have been defined as part of the literature review. Darroch and Giering are planning to apply for funding to build official recommendations and specifications for the optical community for describing individual images and the overall fluxes. The specifications will include all the necessary metadata (e.g. threshold, focus, etc.) and guides on formatting the information in a consistent, interoperable format. It would also define controlled vocabularies and supply digital notebooks such as Jupyter notebooks for documenting data workflows.

3. Define key parameters for interpretation of optical information, and recommend which optical measurements are useful for characterizing particle type, interactions and export.

Partly achieved as part of the literature review and recent publication (Giering et al. 2020). More will follow via TOF2 and method distribution via jetzon.org.

4. Evaluate various techniques and algorithms for the conversion of optical observation into particle type, size, concentration, mass, composition, and fluxes, and recommend ways of improving our understanding of the relationships between these properties.

Achieved. We have addressed this issue as part of the literature review as well as a separate paper submitted to the TOMCAT research topic.

5. Promote sharing of software examples and codes, placed on a public repository.

We have started using digital notebooks to document data analysis workflows (e.g. for one of the Research Topic papers exploring the effect of thresholding on particle size estimates). We will further promote method sharing and provide templates via the JETZON portal.

6. Improve the visibility and usage of data by hosting an inventory of published datasets.

We have discussed options with different platforms and came to the conclusion that EcoTaxa is currently the best platform for sharing. EcoTaxa is a web application dedicated to the visual exploration and the taxonomic annotation of plankton images, and it has the potential to be extended or used as a template for marine snow images.

5. WG activities planned for the coming year. Limit 500 words

Capacity building

We would like to continue our capacity building efforts in Africa by training scientists from developing countries. One goal is to introduce the PlanktoScope to the community as a low cost camera system, and increase the general usage of imaging devices in the framework of oceanography.

Example codes

We have identified the JETZON website as a great tool for sharing data and methods and will continue to publish work examples here.

6. Is the group having difficulties expected in achieving terms of reference or meeting original time schedule? If so, why, and what is being done to address the difficulties Limit 200 words

We are pleased with the overall progress this group has made over the years, and hope to finish the group's official activities with the summer school. This working group has opened the dialogue between many different research groups and – as hoped - has brought researchers from the different fields together. We are looking forward to the summer school and to sharing data and methods via JETZON.

7. Any special comments or requests to SCOR. Limit 100 words.

We thank SCOR for its generous support throughout the years. We would like to ask SCOR to carry over to next year the US\$ 5,000 for travel support of developing country scientist to attend the summer school.

Additional information can be submitted and will be included in the background book for the SCOR meeting at the discretion of the SCOR Executive Committee Reporter for the WG and the SCOR Secretariat.