

Tropospheric Ozone Assessment Report – Phase II

Working Group Guidelines and Procedures

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on behalf of the TOAR-II SC



TOAR-II Quickstart Virtual Event

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TOAR-II Working Group (WG) Guidelines

- WG Definitions: ≥ 6 Scientist from ≥ 3 countries
With goal to synthesize, conduct and/or support the science in the TOAR-II.
- Focus WGs will generate results that help the preparation of the TOAR-II assessment and publish these in Community Special Issue or deliver datasets and/or code to the TOAR data infrastructure.
- Assessment WGs will synthesize the state of science related to tropospheric ozone and publish the core assessment papers that comprise TOAR-II.



TOAR-II Working Group Guidelines

WG Life Cycle

- Application/ presentation to SC/ SC voting.
- Approved Focus WGs with chair persons and info on TOAR-II website and solicitation of community participation.
- WG meetings and production of contributed papers to the TOAR-II Community Special issue and/or data/SW to data portal/toolbox.
- Possible transition to Assessment WG.
- Publication of core assessment papers.



TOAR-II Working Group Guidelines

WG Funding

- WGs provide voluntary in-kind contributions to TOAR-II.
- No funding available for work/travel/publications compensation.
- The TOAR-II SC will support initiatives to leverage funding with recommendation letters.
- If the TOAR-II SC does manage to secure funding for TOAR-II, supporting publication fees and workshops will be prioritized.

TOAR-II Working Group Guidelines

WG Operating Guidelines and Governance

- 1) WG **goals** are to synthesize, conduct or support TOAR-II science.
- 2) WGs fit the **scope** of TOAR-II and are approved by SC.
- 3) WGs will be announced and **solicit participation** from the TOAR community.
- 4) WGs last the **duration of TOAR-II** unless earlier termination is agreed on.
- 5) WGs will review their scope and objectives at least annually in coordination with the SC. To facilitate this, **each WG will have an SC liaison.**



TOAR-II Working Group Guidelines

WG Operating Guidelines and Governance (cont.)

- 6) 6 scientists from 3 countries is a minimum and the SC could advise larger groups to obtain **broad community perspective**.
- 7) WGs will be led by **1-3 chair persons**. WGs appoint chair persons and agree on duration or possible rotation. Assessment WGs should be chaired by the identified lead authors of the assessment papers.
- 8) WGs may **convene their own workshops** and meetings and define collaboration protocols and platforms.



TOAR-II Working Group Applications

WG Applications can be sent by email to the TOAR-II SC and should contain:

- Names and contact info of 1-3 WG co-leads
- Name of SC member to act as liaison (if avail.)
- WG objectives (~10 lines)
- Expected outcomes (bullet list)
- Proposed timeline with assessment contributions
- Confirmation that WG participation is voluntary

Note that TOAR-II SC info/email addresses are at:

<https://igacproject.org/activities/TOAR/TOAR-II>



TOAR-II Working Group Status

Accepted WGs (Soliciting community participation):

- Satellite Ozone Working Group (SOWG)
Leads: Jessica Neu, Paul Palmer
SC Liaison: Helen Worden
- Oceania WG
Lead: Ian Galbally
SC Liaison: Martin Schultz



TOAR-II Working Group Status

Potential WGs (Leads included, if identified):

- Other regional WGs (e.g. Africa, E. Asia)
- Tropical ozone budget (sources and transport)
(Audrey Gaudel)
- Ozone precursors
- Ozone profiling methods
- Ozone over oceans and role of tropospheric halogen precursors (Roberto Sommariva and Alfonso Saiz-Lopez)
- Statistics (Kai-Lan Chang)
- Evaluation and harmonisation of ground based instruments (Roeland Van Malderen and Herman Smit)



TOAR-II Satellite Ozone Working Group

Genesis and Formation:

- The SOWG resulted from discussions between the co-leads (**Paul Palmer and Jessica Neu**) and steering committee member (**Helen Worden**) about the differences in satellite ozone trends found during **TOAR-I** (**Gaudel et al., 2018**)
- There was a strong desire, which had been echoed by others in the community, to better understand what drives the differences in these trends
- The co-leads and SC member identified a set of analyses that was likely to shed light on the issue and started a google doc to flesh them out.



TOAR-II Satellite Ozone Working Group

Genesis and Formation:

- The resulting document laid out an approach that:
 - Uses chemistry transport models as an intermediary or “transfer standard” between different satellite sensors (taking into account their vertical sensitivity and sampling patterns) and between the satellite sensors and ground-based and aircraft in situ data.
 - Provides the **TOARII** satellite groups with a common methodology for validating trends using the long-term ozonesonde record.



TOAR-II Satellite Ozone Working Group

Approval Process:

- The co-leads presented the concept to the Steering Committee along with a proposed timeline
- They incorporated feedback from the SC and sent an updated version of the SOWG documentation

Next Steps:

- The SOWG has contacted the satellite groups that participated in **TOAR I** and will formalize their participation in the WG
- We also solicit additional analysis concepts focused on satellite records of ozone from other interested members of the community



TOAR-II Satellite Ozone Working Group

Initial List of Relevant Datasets

Satellite - Instrument	Time period	Groups
Metop A,B,C - IASI	2008 - present	LATMOS (FORLI retrieval) LISA (KOPRAFIT retrieval) U.Toulouse/CNRS (SOFRID)
Metop A,B,C - GOME-2	2008 - present	U. Bremen
Metop - IASI/GOME-2	2008 - present	LISA (KOPRAFIT) STFC
Aura - OMI trop. column	2004 - present	NASA/GSFC KNMI
Aura - OMI/MLS	2004 - present	NASA/GSFC
Aura - OMI profile	2004 - present	SAO
Aqua - AIRS/ Aura - OMI	2004 - present	NASA/JPL
Aura - TES	2004 - 2010	NASA/JPL
Envisat - SCIAMACHY	2002 - 2012	U. Bremen

- Proposed study period: 2004-2021
- We are interested in analyzing data to Spring 2021 so we can include the pandemic period and the anticipated return of emissions
- We will also include TROPOMI (as a follow-on to OMI) and GEMS (to provide TrO₃ diurnal cycle).



TOAR-II Satellite Ozone Working Group

Proposed Timeline (has already slipped due to COVID!)

Summer 2020: Solicit participation in working group and set up virtual meetings

Fall 2020: Generate the methodology for direct satellite-sonde comparisons to be distributed to the various groups

Winter 2020: Establish the evaluation period to be used as well as a common definition for the vertical extent of the measurements (e.g. tropospheric ozone column, partial column, individual pressure levels, etc).

Spring 2021: Request data from the satellite groups (updates from TOAR-I contributors).

Summer 2021: Begin analysis using the model output to reconcile difference among the satellite trends up to Spring 2021, taking into account big changes in 2020 due to Covid-19 and expected emission changes in 2021.

Spring 2022: Complete analysis using the model and assess the consistency of the satellite trends with one another and with in situ data

Fall 2022-Winter 2023: Write up results of our analysis for publication

Spring 2024: submit for publication as part of TOAR II.