



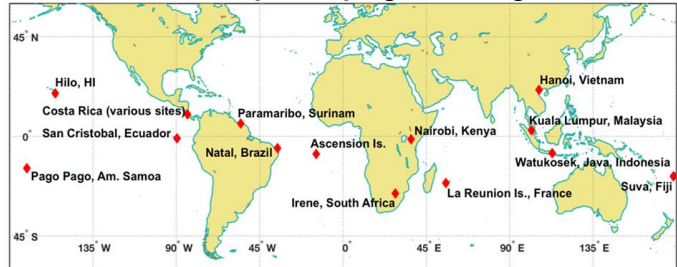
# SHADOZ Notes

## Southern Hemisphere Additional OZonesondes

A NASA/Goddard Space Flight Center public archive of tropical and remote ozonesonde profile data

SHADOZ is a NASA project to augment and archive balloon-borne ozonesonde launches and to archive data from tropical and remote operational sites. The project was initiated in 1998 by NASA/Goddard Space Flight Center, the NOAA/Global Monitoring Division, and international co-investigators. There are currently thirteen stations launching ozonesondes in the SHADOZ network. The collective data set provides the first climatology of tropical ozone in the equatorial region, enhances validation studies aimed at improving satellite remote sensing techniques for tropical ozone estimations, and serves as an educational tool to students, especially in participating countries.

### SHADOZ Sites: <https://tropo.gsfc.nasa.gov/shadoz>



### ❖ Natal Resumes Operations After COVID-19 Shutdown ❖

With the unprecedented events surrounding COVID-19 shutdowns, all of the SHADOZ stations and their staff went to great lengths to safely maintain or resume their launch schedules. At Natal, Brazil, ozonesonde launches and Dobson readings resumed early November 2020. **Great effort by the entire NATAL team pictured below!**



**Figure (Top, left-to-right):** Kelvem L. de Freitas, Francisco R. da Silva, Moisés F. de Queiroz, and Tércio L. B. Penha (INPE) around Dobson instrument. **(Bottom, left-to-right):** Kelvem and Tércio launching ozonesonde on 25 November 2020.



### ❖ NASA & LAPAN Sign Agreement for Restart of SHADOZ in Indonesia ❖

NASA and LAPAN (photo left) signed a cooperative agreement in Nov. 2020 for ozonesonde launches and data sharing with Indonesia. This arrangement resumes SHADOZ ozonesonde operations at the Watukosek, Java station, discontinued in 2013. Dr. Ninong Komala (photo right) trains LAPAN staff for launches expected to resume in early 2021.



**Figure (Left):** Christianus R. Dewanto (LAPAN) signs agreement in Nov. 2020. **(Right):** Dr. Ninong Komala and the LAPAN Watukosek staff practice launches early 2020.

## ❖ SHADOZ at Virtual Meetings & NASA Award Recipients ❖

- Fall 2020 meetings organized remotely had a SHADOZ presence:
  - (1) SAGE III/ISS Science Team Meeting, October 19-20, 2020:** *R. Stauffer* presented an update on the Ticosonde project in Costa Rica. *A. Thompson* summarized new tropical SHADOZ ozone trends.
  - (2) ASOPOS Report 2.0 Authors & Reviewers Meeting, October 28, 2020:** Several SHADOZ Co-Is or contributors participated as either a co-author or reviewer of the new ASOPOS 2.0 Report. **A major accomplishment in 2020 is the finalization of this latest update to Ozonesonde Standard Operating Procedures (SOPs). WMO will publish the Report in 2021.**
  - (3) NDACC Steering Committee Meeting, 4-6 Nov 2020:** *R. Stauffer*, new Sonde Working Group Co-Chair, discussed results from *Stauffer et al. (2020)* (listed below) on the observed Total Column Ozone (TCO) dropoff in ozonesonde data at ~1/3 of global stations, including SHADOZ & Canadian sites. *A. Thompson* presented an overview of the status of SHADOZ stations in 2020 including COVID-19 impacts.
- In other news, NASA Goddard Space Flight Center awarded a NASA group achievement award to three SHADOZ contributors for their influential work on the *Stauffer et al. (2020)* paper (listed below): Ryan Stauffer (lead author, SHADOZ Res. Assoc), Debra Kollonige (SHADOZ Archiver), and Rennie Selkirk (SHADOZ Co-I). **Congratulations!**

### ❖ Recent noteworthy ozonesonde publications ❖

Tarasick, D. W., Smit, H. G. J., Thompson, A. M., Morris, G. A., Witte, J. C., Davies, J., et al. (2020). Improving ECC ozonesonde data quality: Assessment of current methods and outstanding issues, accepted for AGU's Earth and Space Science, 2019EA000914RRR.

Vömel, H., Smit, H. G. J., Tarasick, D., Johnson, B., Oltmans, S. J., Selkirk, H., Thompson, A. M., Stauffer, R. M., Witte, J. C., Davies, J., van Malderen, R., Morris, G. A., Nakano, T., and Stübi, R. (2020). A new method to correct the ECC ozone sonde time response and its implications for "background current" and pump efficiency, *AMT*, 13, 5667–5680, <https://doi.org/10.5194/amt-13-5667-2020>.

Stauffer, R. M., Thompson, A. M., Kollonige, D. E., Witte, J. C., Tarasick, D. W., Davies, J., et al. (2020). A post-2013 dropoff in total ozone at a third of global ozonesonde stations: Electrochemical concentration cell instrument artifacts? *Geophys. Res. Lett.*, 47, e2019GL086791, <https://doi.org/10.1029/2019GL086791>.

Thompson, A. M., et al. (2019). Ozonesonde Quality Assurance: The JOSIE-SHADOZ (2017) Experience. *Bull. Amer. Meteor. Soc.* <https://doi.org/10.1175/BAMS-D-17-0311.1>

Sterling, C. W., et al. (2018). Homogenizing and estimating the uncertainty in NOAA's long term vertical ozone profile records measured with the electrochemical concentration cell ozonesonde. *Atmos. Meas. Tech.* <https://doi.org/10.5194/amt-2017-397>

Witte, J. C., A. M. Thompson, H. G. J. Smit, H. Vömel, R. Stübi, and F. Posny (2018). First Reprocessing of Southern Hemisphere ADDitional OZonesondes (SHADOZ) Profile Records. 3. Uncertainty in Ozone Profile and Total Column. *J. Geophys. Res.*, 123. <https://doi.org/10.1002/2017JD027791>

Thompson, A. M. et al. (2017). First Reprocessing of Southern Hemisphere ADDitional OZonesondes (SHADOZ) Ozone Profiles (1998-2016). 2. Comparisons with Satellites and Ground-based Instruments. *J. Geophys. Res.*, 122. <https://doi.org/10.1002/2017JD027406>

Witte, J. C., A. M. Thompson, et al. (2017). First reprocessing of Southern Hemisphere ADDitional OZonesondes (SHADOZ) profile records (1998-2015) 1: Methodology and evaluation. *J. Geophys. Res.*, 122. <https://doi.org/10.1002/2016JD026403>

## ❖ Upcoming Relevant Meetings ❖

SHADOZ will be represented at the following:

**10-14 Jan. 2021:**

American Meteorological Society Meeting

**14-16 April 2021:**

Ozone Research Managers Meeting

**13-17 September 2021:**

NDACC Steering Committee Meeting  
International Global Atmos. Chem. (IGAC) Meeting

**3-9 Oct 2021:**

Quadrennial Ozone Symposium  
Seoul, Korea

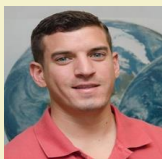
### Attention Data Users:

- Questions about SHADOZ should be directed to PI, Anne Thompson. SHADOZ data sets are products of evolving research by the site Co-Investigators (Co-Is) and ongoing community collaboration.
- The SHADOZ homepage gives technical and contact information for each station and their Co-Is responsible for the original data processing. Co-Is should be consulted for details of their methods & appropriate references to their work.
- Questions about the final data and any news updates should be directed to the Archiver: Debra Kollonige.

### ▶ SHADOZ Network Science Team ◀



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