

Long-term monitoring of atmospheric greenhouse gases and data validation in NIES-VOS program

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The National Institute for Environmental Studies (NIES) has performed atmospheric monitoring of greenhouse gases and other climatically important gases and aerosols over the Pacific Ocean under NIES Volunteer Observing Ship (VOS) program, which has been operated by the Centre for Global Environmental Research of the NIES since 1992. The gas monitoring in the NIES-VOS program was made along three constant routes: North Pacific (Japan-USA) and Oceania (Japan-Australia/New Zealand) routes for background atmospheric monitoring and Southeast Asia (Japan-Southeast Asian countries) route for anthropogenically polluted atmospheric monitoring (e.g., Nara et al., 2011).

On board the VOS ships, we have performed measurements of CO₂, CH₄, CO and O₃ along with flask sampling observation followed by laboratory analysis of CO₂, CH₄, N₂O, CO, H₂, SF₆, O₂/N₂. For CO₂, we have distributed the onboard measurement data on the web (<http://soop.jp/> or <http://www.socat.info/>) for the use in the ocean CO₂ research community. We now go ahead with rigorous validation work for the atmospheric CO₂ measurement data through the comparison with that from flask sampling analysis to fulfill the WMO recommended inter-laboratory compatibility for the use in the atmospheric research community, together with those for CH₄ and CO.

We will describe detailed our quality assurance and quality control system for the NIES-VOS data and will present results from the validation work for CO₂, CH₄, and CO.

References

H. Nara et al., Onboard measurement system of atmospheric carbon monoxide in the Pacific by voluntary observing ships, *Atmos. Meas. Tech.*, 4, 2495-2507, doi:10.5194/amt-4-2495-2011, 2011.