NAAMES-3 HSRL-1 ReadMe

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NASA/Langley Airborne HSRL-1
NAAMES 2017
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PLATFORM: NASA/Wallops C-130
LOCATION: Lat, Lon, and Alt included in the nav data records
ASSOCIATED_DATA: N/A
INSTRUMENT_INFO: High Spectral Resolution Lidar (HSRL)
DATA_INFO: 10 second profiles, higher resolution HDF5 files available upon request
UNCERTAINTY: Uncertainty products are included in this release
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PROJECT_INFO: NAAMES 2017
STIPULATIONS_ON_USE: Use of these data request informing the PI
OTHER_COMMENTS: During NAAMES-3, HSRL-1 experienced issues with both the PMT and HPD perpendicular (perp) channels. For normal operations, the HPD perp channel is used for the ocean retrievals and the PMT perp channel is used for the atmospheric retrievals. However, the performance of both perp channels can be used in either of these regions. Typically, the HPD perp channel experienced issues from contamination of the window port after low flight altitudes were conducted. This resulted in the HPD having a small oscillation in the signal profile. The PMT experienced issues due to a loose cable connection and was intermittent during the later flights of the mission. On 9/12 and 9/16 the data required replacing the PMT perp channel with the HPD perp channel for the atmospheric measurements. On 9/17, the data required replacing the HPD perp channel with the PMT perp channel for the ocean measurements. However, a small oscillation on the PMT perp channel adds an error estimated to be less than 1.5% for retrieved atmosphere and ocean depolarization data. On the 9/19 and 9/20 flights, both channels experienced issues at the same time. On 9/19, the atmospheric backscatter was calculated using only the parallel channels and assuming that the depolarization is zero. This is estimated to result in less than 10% error in the atmospheric backscatter data for this flight and the depolarization data is not reported for the entire flight. On 9/19, the ocean backscatter is calculated assuming a depolarization of 3% from 10 to 18 UTC based on a mean value from previous flights. This is estimated to result in less than 3% error in the ocean backscatter. The ocean depolarization is not reported from 10 to 18 UTC. The ocean products are calculated as normal at the beginning and end of the flight. On the 9/20, the PMT perp channel was replaced by the HPD perp channel. The HPD perp channel also had an oscillation during the flight that impacted the measurements. The atmospheric depolarization has estimated errors of <1% and the backscatter data have estimated errors less than $1.0e^{-5}m^{-1}sr^{-1}$. After 14 UTC the oscillations increased on the HPD perp channel. Therefore, the ocean backscatter is calculated assuming a depolarization of 3% from 14 UTC until end of the flight. The ocean depolarization is not reported after 14 UTC. Estimated uncertainties on HSRL-1 data products are included in this release. Uncertainty estimates are calculated based on noise estimates from the raw data and propagated in the retrievals to estimate the precision of each data product. The noise of the raw data used a conservative approach resulting in overestimates of the errors by 20%.
REVISION: R0
Archive Data - subsetted from processed atmospheric and ocean files Aug 19, 2018
Data products are matrices with dimensions time (/Nav_Data/gps_time) x altitude (/DataProducts/Altitude) or depth (/OceanDataProducts/Depth)
Atmospheric Data Products (atmospheric products such as backscatter, extinction, etc) are under /DataProducts/
Ocean Data Products (ocean products such as kd and bbp) are under /OceanDataProducts/
Sonde (State_Type=1) or GMAO (State_Type=2) data are interpolated to HSRL curtains (temperature, pressure, etc.) are under /State/
Nav Products (time, lat, lon, pitch, roll, etc.) are under /Nav_Data/
Subset files include typing under /DataProducts/Aerosol_ID