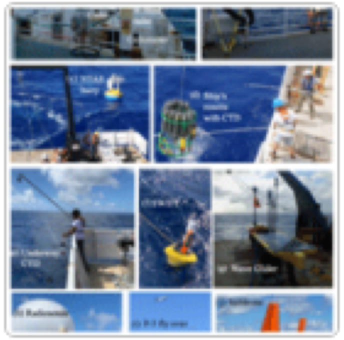
Measurements from the RV *Ronald H. Brown* and related platforms as part of the Atlantic Tradewind Ocean-Atmosphere Mesoscale Interaction Campaign (ATOMIC)



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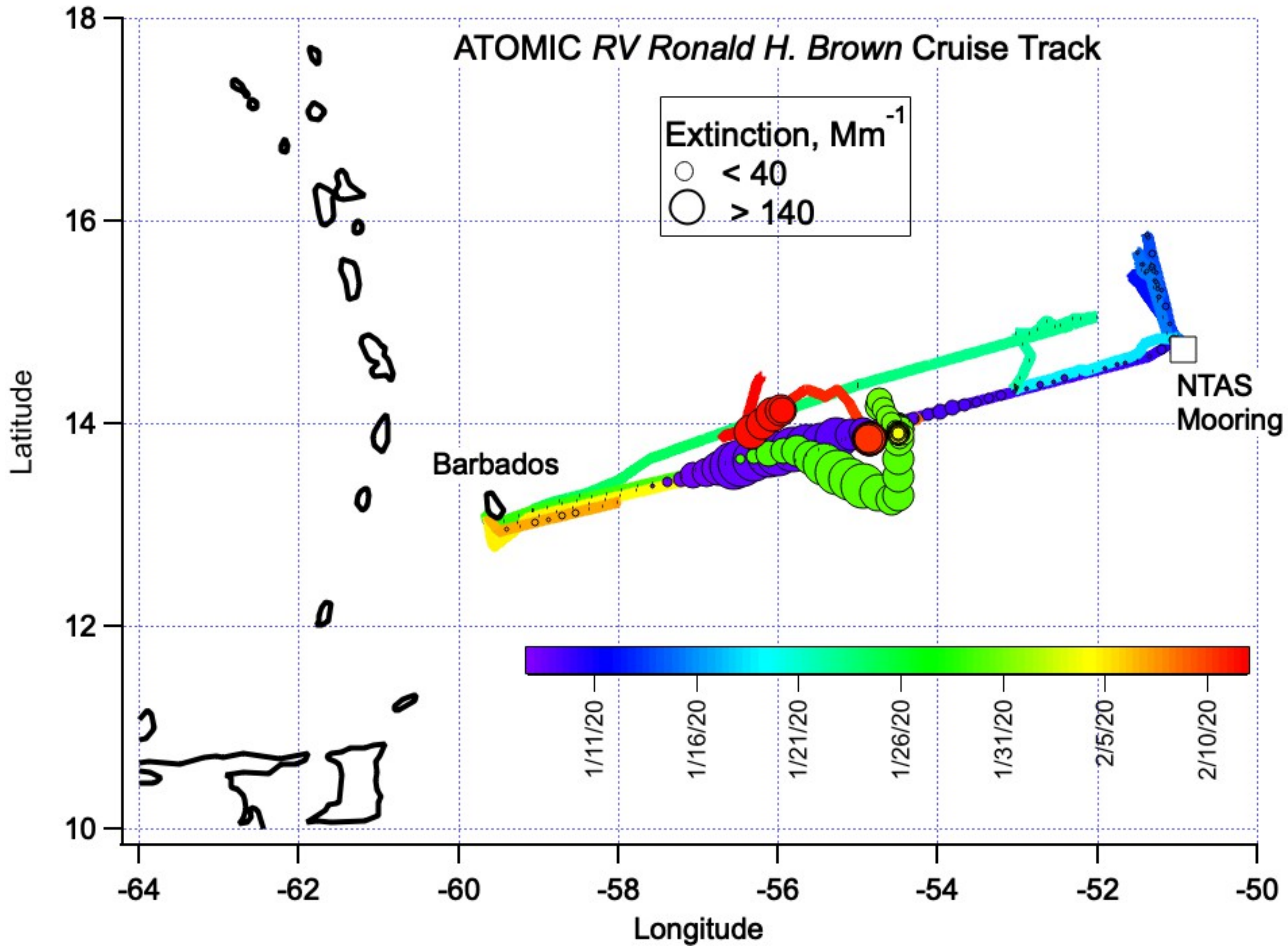
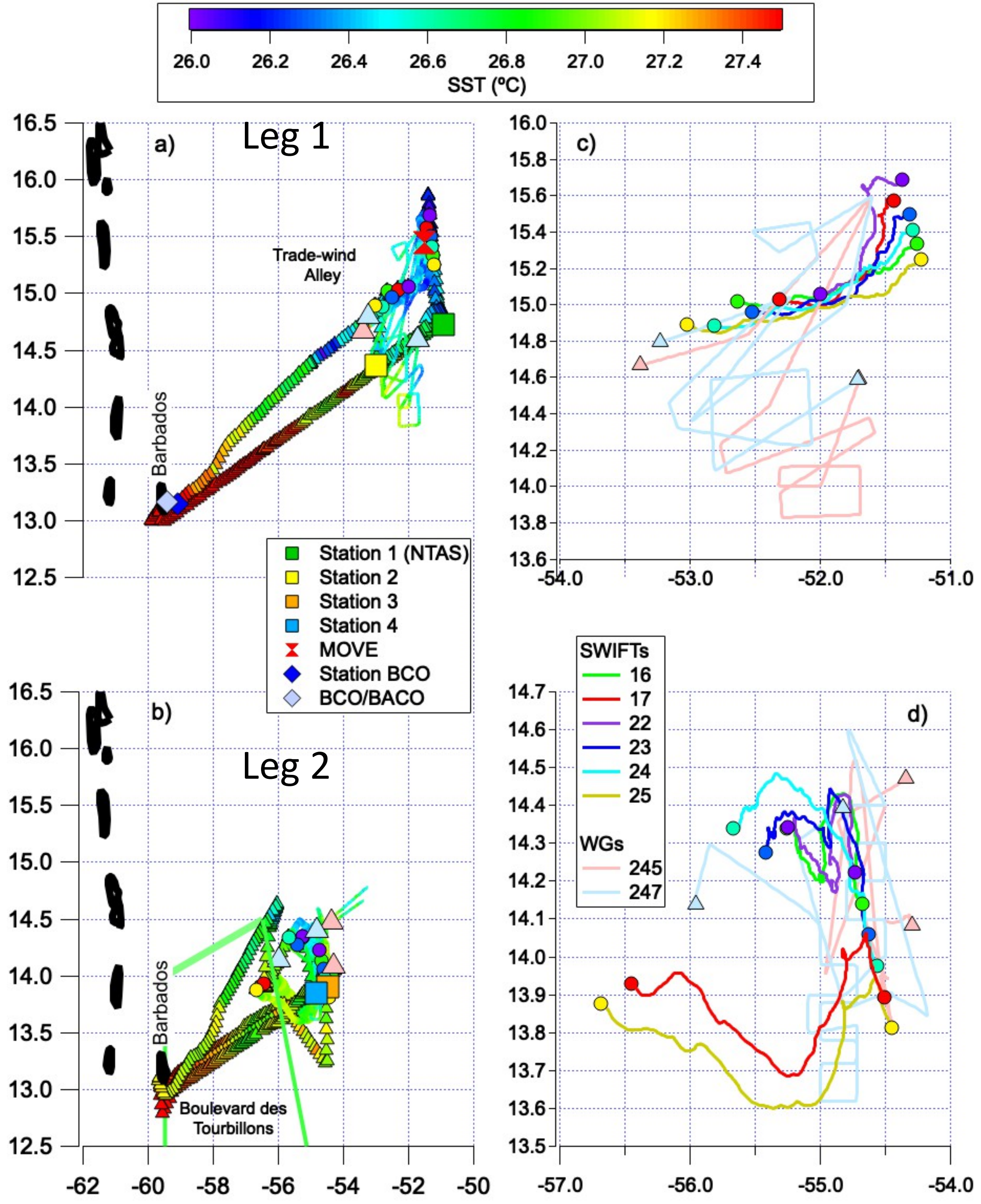


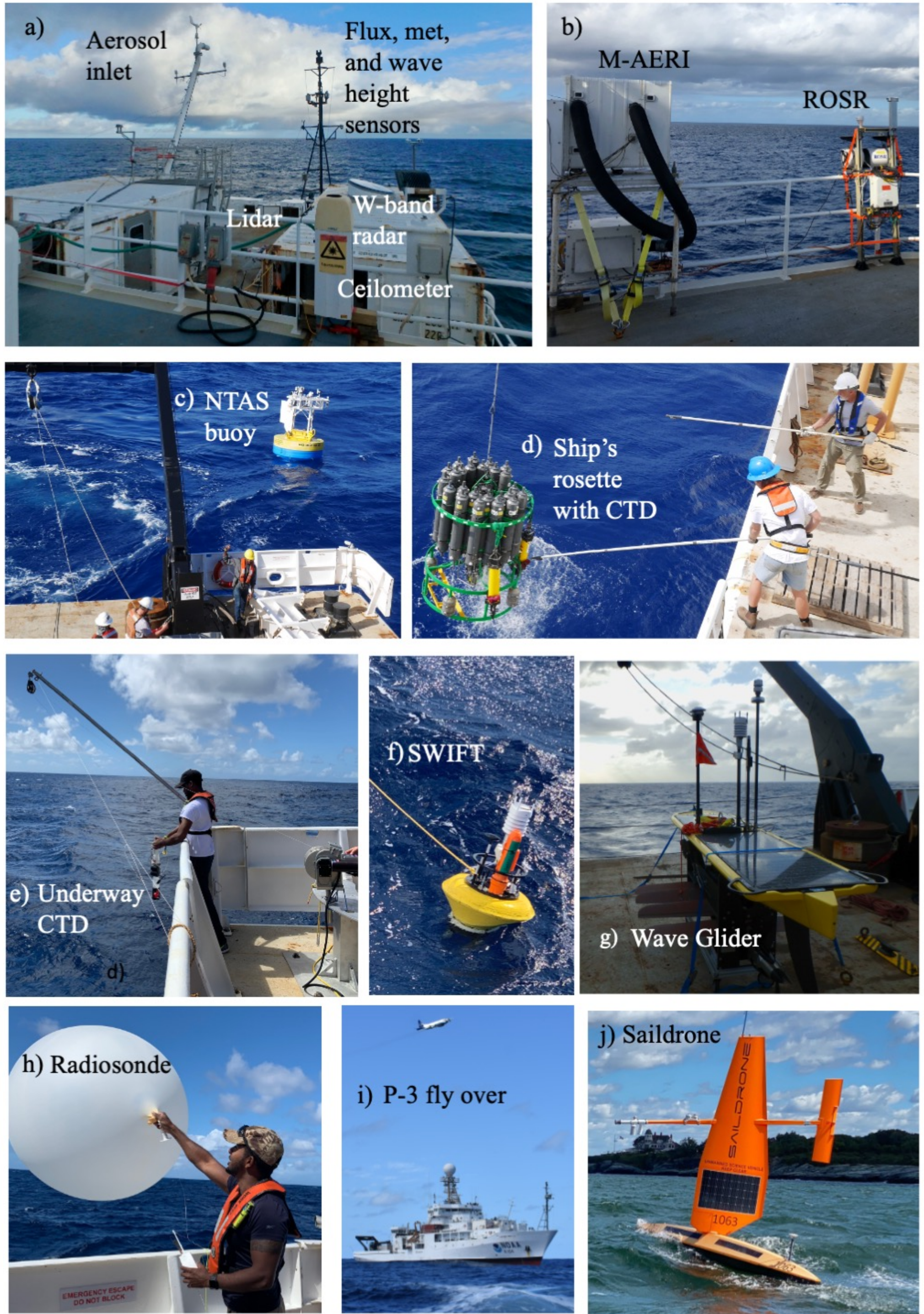
ATOMIC *RV Ronald H. Brown* Cruise Track
Extinction, Mm^{-1}
< 40
> 140
NTAS
Mooring
Barbados
Latitude
Longitude
18
16
14
12
10
-64
-62
-60
-58
-56
-54
-52
-50
1/11/20
1/16/20
1/21/20
1/26/20
1/31/20
2/5/20
2/10/20



Tracks of RHB, Wave Gliders, and SWIFTS colored by seawater skin temperature

Paper includes:

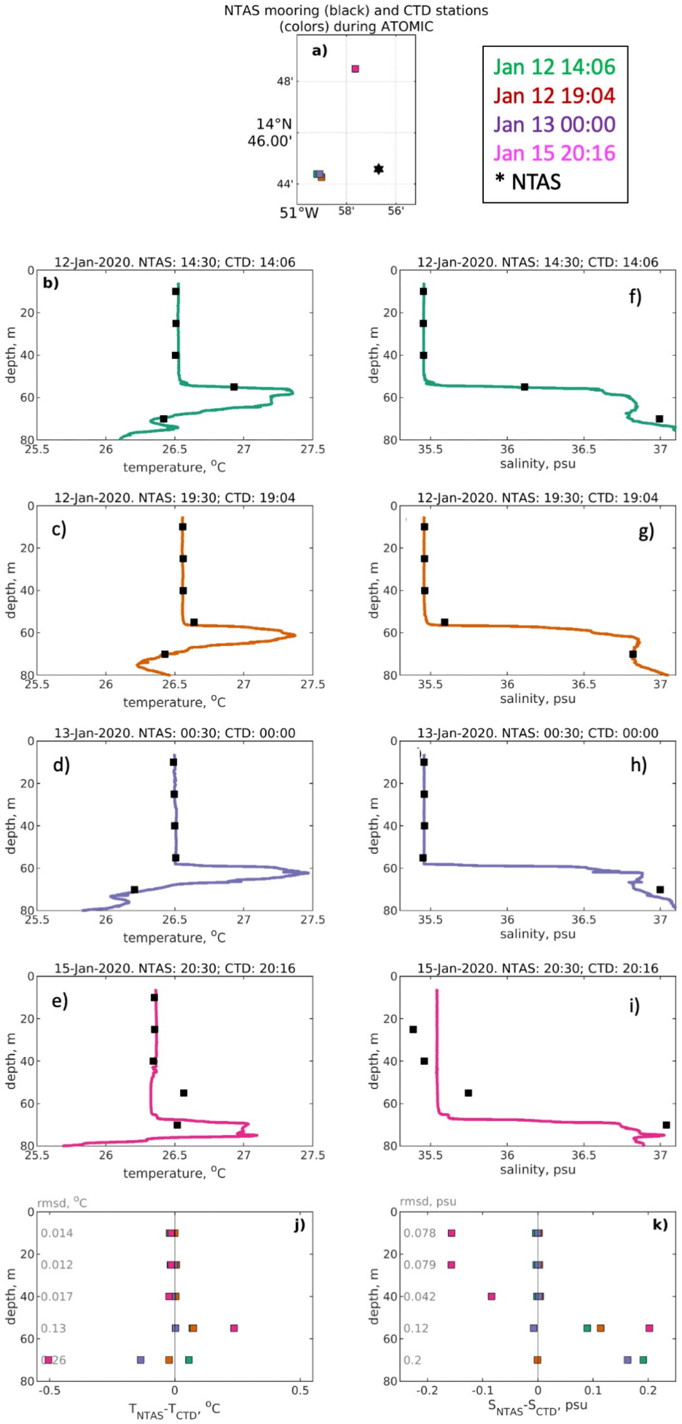
- Tables of dates and positions of deployment and recovery of NTAS moorings, two Wave Gliders, and six SWIFTs.
- Times when platforms were within close proximity providing opportunities for inter-platform comparisons.



Instrumentation onboard RHB for the measurement of atmospheric and oceanic parameters and assets deployed. Not shown are the disdrometers on the port O3 deck and sky camera on the starboard O3 deck.

Paper includes:

- Table of the timeline of sampling events including coordination with other platforms, NTAS operations, downwind transits, and periods at each station.
- Details of instrumentation onboard RHB, deployed assets, NOAA operated Saildrones, RAAVEN UAS, SVPS drifters, and at the BACO and BCO.



Comparison of upper ocean temperature and salinity from the NTAS-18 mooring and RHB (solid lines are RHB, markers are NTAS).

RHB CTD and NTAS mooring were within 0.5 to 3 NM of each other.

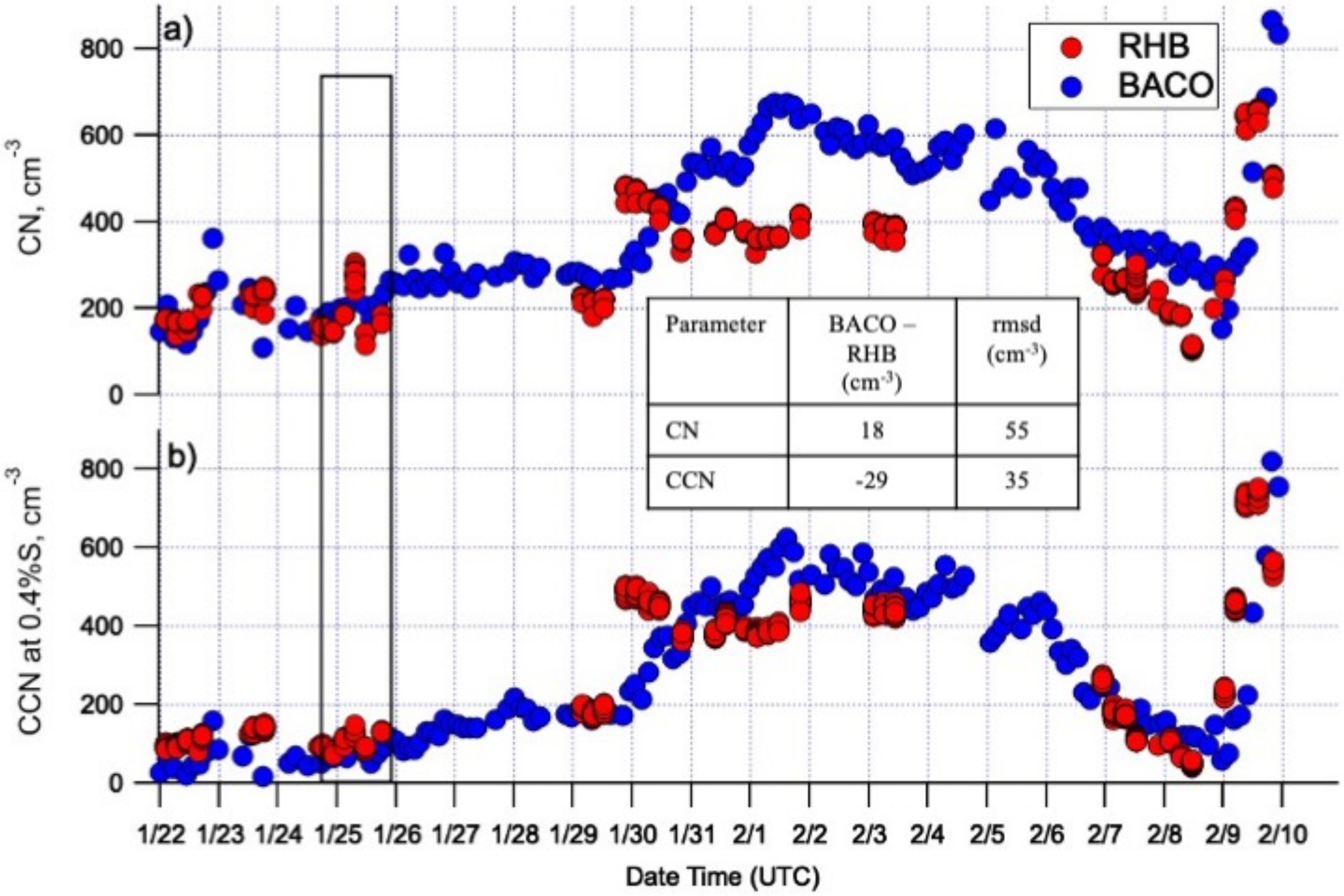
Jan. 12 and 13 comparisons agreed well.

Jan 15. comparison showed significant differences for temperature and salinity due to horizontal gradients in a frontal region.

Paper also includes comparisons between:

- NTAS – RHB met parameters,
- BCO – RHB met parameters,
- Saildrone – RHB met parameters,
- BACO – RHB aerosol parameters,
- RHB, BCO, RAAVEN cloud base height.

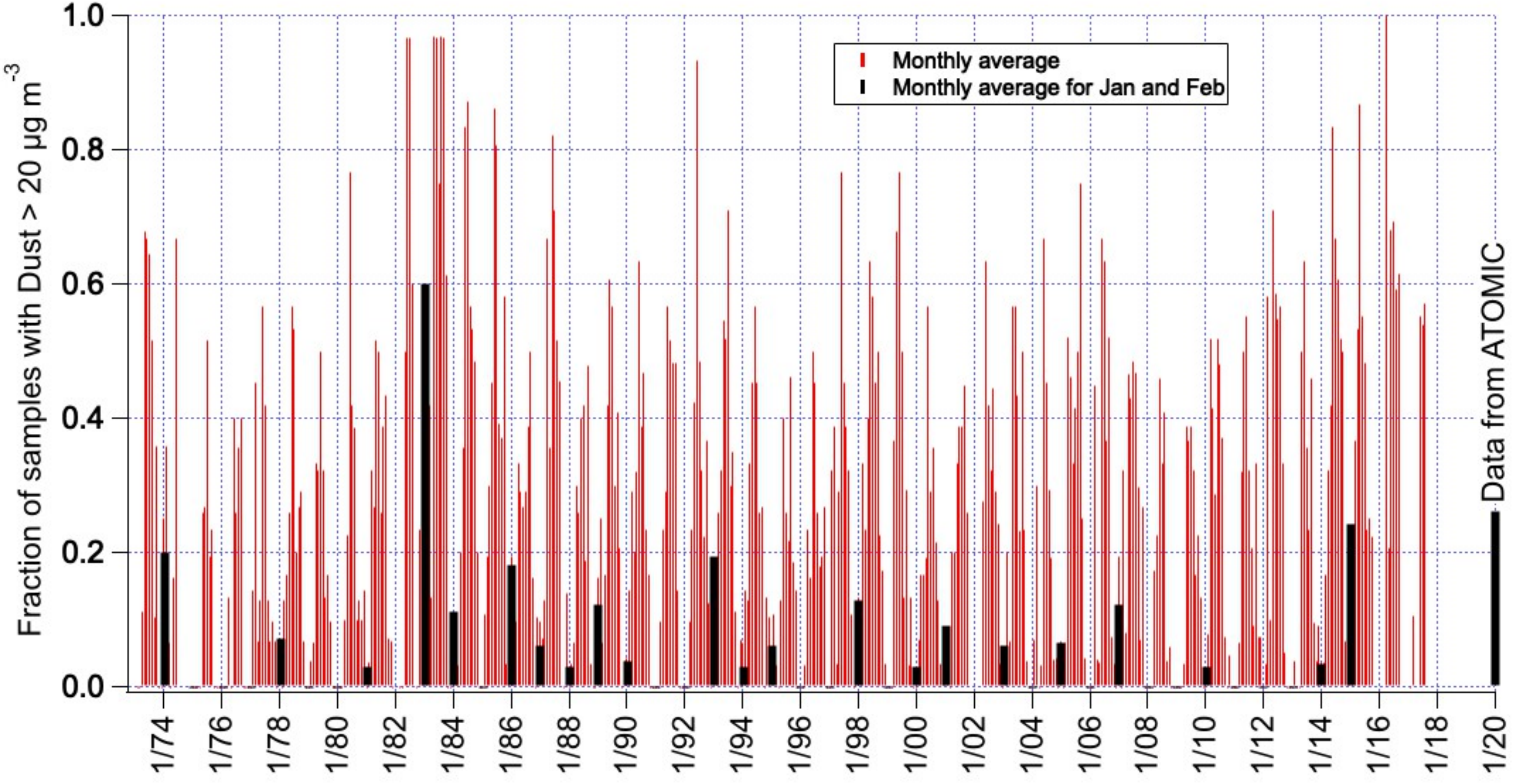
Aerosol CN and CCN concentrations measured onboard RHB and at BACO
The rectangle indicates the comparison period when RHB was 20 NM due east of BACO



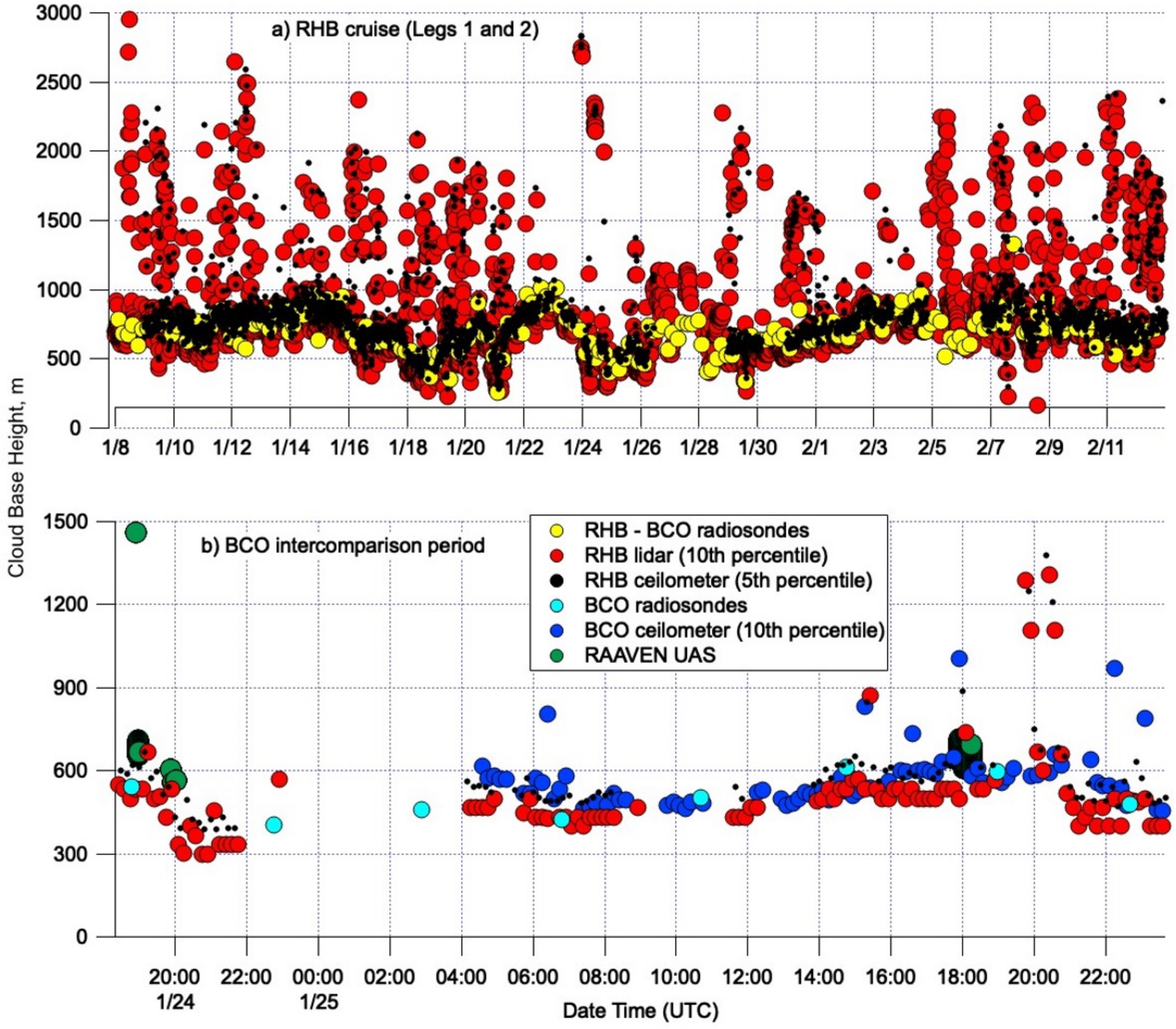
Parameter	BACO – RHB (cm^{-3})	rmsd (cm^{-3})
CN	18	55
CCN	-29	35

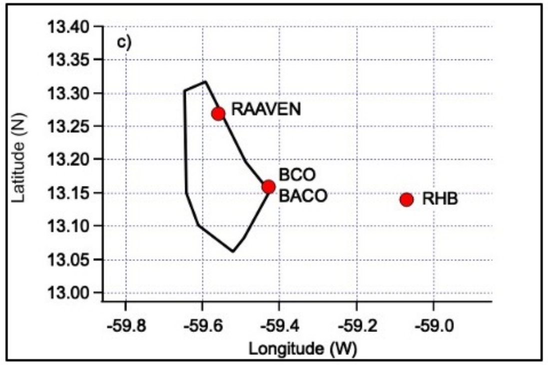
- Both platforms sampled clean, marine conditions until ~Jan 29.
- Subsequent enhanced concentrations correspond to periods when dust and biomass burning reached the study area after transport from Africa.
- The coherence of CN and CCN concentrations between the platforms, even when separated by 4 degrees of longitude, indicates a broad-scale dust event.

How typical were winter time dust concentrations during ATOMIC?
Comparison to monthly average values from BACO.



Cloud base height from RHB (radiosonde LCL, lidar, ceilometer), BCO (radisonde LCL, ceilometer), RAAVEN





Comparison to RHB lidar	Absolute difference (m)	rmsd (m)	N
RHB cruise Legs 1 and 2			
RHB-BCO LCL from sondes	-137	15	197
RHB ceil	0.66	360 73*	3139
BCO comparison period			
BCO LCL from sondes	-37	88	6
RHB ceil	68	81	91
BCO ceilometer	35	200	56
RAAVEN	110	32	6

Lowest values from the lidar and ceilometers track well with LCL values derived from the radiosondes.

Higher values from the lidar and ceilometers are likely due to clouds aloft that are separated horizontally from the locations of cloud base.

Platform	Data set	Data links	Point of contact	Reference
All	ATOMIC	https://www.ncei.noaa.gov/archive/accession/ATOMIC-2020	elizabeth.thompson@noaa.gov	NOAA (2020)
RHB	Air–sea fluxes, ship navigation/location information, meteorological parameters, solar and infrared radiation, rain rate, subskin seawater T, skin seawater T (NOAA PSL)	https://doi.org/10.25921/etxb-ht19	elizabeth.thompson@noaa.gov	Thompson et al. (2021a)
	ROSR skin seawater T (NOAA PSL)	https://doi.org/10.25921/nwx9-rd07	elizabeth.thompson@noaa.gov	Thompson (2021)
	Sky camera (University of Miami)	https://doi.org/10.25921/7kpt-d764	pzuidema@rsmas.miami.edu	
	Ceilometer (NOAA PSL)	https://doi.org/10.25921/jbz6-e918	elizabeth.thompson@noaa.gov	Thompson et al. (2021b)
	Disdrometer (rain rate, drop number, equivalent radar reflectivity) (University of Miami)	https://doi.org/10.25921/pfgy-7530	pzuidema@rsmas.miami.edu	Zuidema (2021b)
	W-band radar (University of Miami in partnership with NOAA PSL)	https://doi.org/10.25921/44cy-kr53	pzuidema@rsmas.miami.edu elizabeth.thompson@noaa.gov	Thompson et al. (2021c)
	M-AERI skin seawater T, air humidity and temperature (University of Miami)	https://doi.org/10.25921/db6z-z646	pzuidema@rsmas.miami.edu gszczodrak@rsmas.miami.edu	Zuidema et al. (2021)
	Doppler lidar (NOAA CSL)	https://doi.org/10.25921/74pc-me66	alan.brewer@noaa.gov	Brewer (2021)
	Picarro water vapor isotopes (OSU/NCAR)	https://doi.org/10.25921/s76r-1n85	david.noone@auckland.ac.nz	Noone (2021)
	Meteorological and aerosol properties (NOAA PMEL)	https://doi.org/10.25921/yf54-2c81	derek.coffman@noaa.gov	Quinn and Coffman (2021)
	Radiosondes (OSU)	https://doi.org/10.25326/62	simon.deszoeke@oregonstate.edu	Stephan et al. (2020)
	Underway CTD, uCTD (APL-UW)	https://doi.org/10.25921/nsmv-0c33	kdrushka@apl.uw.edu	Drushka (2021c)
	Ship rosette CTD (APL-UW)	https://doi.org/10.25921/zycs-th03	kdrushka@apl.uw.edu	Drushka (2021a)
	Ship ADCP (APL-UW)	https://doi.org/10.25921/b6wh-zr34	kdrushka@apl.uw.edu	Drushka (2021b)
NTAS mooring	Meteorological parameters, air–sea fluxes, solar and infrared radiation; ocean currents, waves, conductivity, salinity, and temperature (WHOI)	https://doi.org/10.25921/er1a-hq72	aplueddemann@whoi.edu	Plueddemann et al. (2021)
Wave Gliders	Air–sea fluxes, meteorological parameters, radiation; ocean currents, turbulence, waves, conductivity, and temperature (APL-UW)	https://doi.org/10.25921/dvys-1f29	jthomson@apl.washington.edu	Thomson et al. (2021a)
SWIFT drifter	Air–sea fluxes, meteorological parameters, radiation; ocean currents, turbulence, waves, conductivity, and temperature (APL-UW)	https://doi.org/10.25921/s5d7-tc07	jthomson@apl.washington.edu	Thomson et al. (2021b)
Saildrones (NOAA)	Air–sea fluxes, meteorological parameters, radiation; ocean currents, waves, conductivity, and temperature (NOAA PMEL)	https://doi.org/10.25921/9km0-f614	dongxiao.zhang@noaa.gov	Zhang and Zhang (2021)
Saildrones (NASA)	Air–sea fluxes, meteorological parameters, radiation; ocean currents, waves, conductivity, and temperature (NASA)	https://doi.org/10.5067/SDRON-ATOM0	cgentemann@faralloninstitute.org	Saildrone (2020)
SVPS drifters	Meteorological and ocean parameters, wind stress (NOAA AOML)	https://doi.org/10.25921/2pzq-4d52	greg.foltz@noaa.gov	NOAA (2021)
RAAVEN miniFlux	Met parameters (University of Colorado)	https://doi.org/10.25921/jhnd-8e58	gijs.deboer@noaa.gov	de Boer et al. (2021a)

Summary of data sets and DOIs, point of contact information, and references for data collected onboard RHB, NTAS, Wave Gliders, SWIFTs, NOAA- and NASA-operated Saildrones, and RAAVEN UAS during ATOMIC.

Data are permanently and publicly available at NCEI.

(https://www.ncei.noaa.gov/archive/accession/ATOMIC-2020