NOAA's Jason-3 Products

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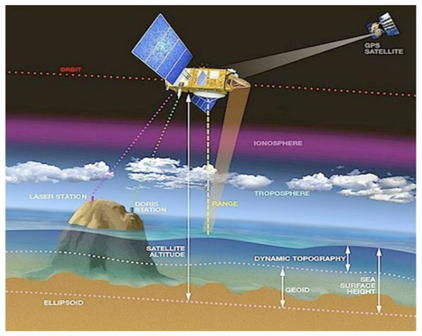
The interagency **Jason-3** mission derive sea surface height, wind speed, and significant wave height from altimetry data to help track global sea level rise, ocean currents, open-ocean wind and wave conditions, and upper ocean heat content. Four partner agencies share mission responsibilities. NOAA's roles include satellite command and control, operational data processing, operational data distribution, and archive of data, processing software, and documentation. https://www.ospo.noaa.gov/Operations/JasonSeries/,https://www.ncei.noaa.gov/products/jason-satellite-products/,https://www.star.nesdis.noaa.gov/sod/lsa/Jason/

THE ALTIMETRIC SYSTEM



For Sea Surface Height:

Range = travel_time * c / 2

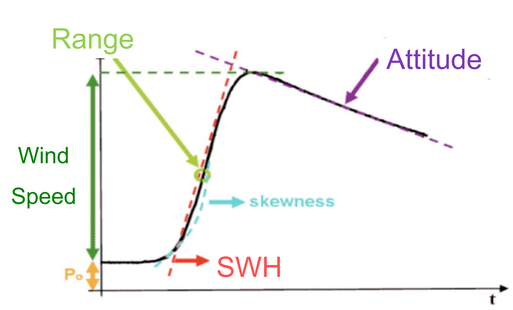
SSH = orbit_altitude – range
Small Δ out of ~1300 km

Dyn. Topo. = SSH – geoid
~1 m out of ± 120 m

Path Delay Corrections:
- Wet Troposphere
- Dry Troposphere
- Ionosphere

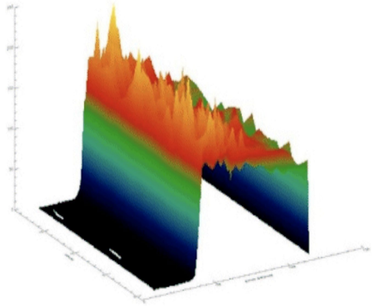
Primary Jason measurement is range (distance between the satellite and the ocean surface)
Uses travel time of a radar pulse from satellite to ocean surface and back, requiring a high degree of precision, calculation, and additional corrections. Accurate measurement of satellite altitude using GPSP Global Positioning System Payload), DORIS (Doppler Orbitography and Radiopositioning Integrated by Satellite) and LRA (Laser Retroreflector Array), is required to compute sea surface height (SSH)

ALTIMETRY DATA COLLECTION

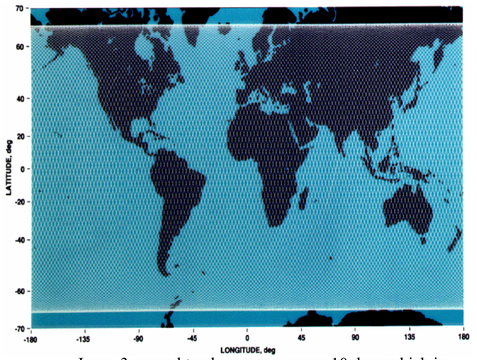


- 105 radar pulses averaged to create each 20Hz waveform
- Comprised of 128 bins of ~3 nanosec duration (45 cm)
- 4 values determined by fitting
- 20Hz values averaged to create 1 Hz record

At the satellite, travel time of radar pulse and return strength (or power) are measured. X-axis displays time, Y-axis displays power. Range travel time for Sea Surface Height (SSH) obtained by projecting 50% power value on leading edge of curve onto time axis. Wind speed is inversely related to return power. Significant Wave Height (SWH) related to slope of leading edge of return power.

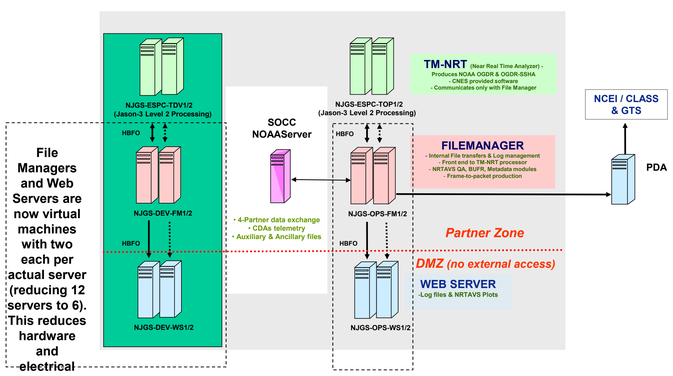


Waveforms show open-ocean variability



Jason-3 ground track coverage every 10 days which is the same orbital path as Jason-2 before 2-Oct-2016

ESPC PROCESSING



NOAA's Environmental Satellite Processing Center (ESPC) Jason-3 near-real-time operational geophysical data records (OGDRs) from data collected at NOAA's Wallops and Fairbanks ground stations and delivered through the SOCC NOAA Server. ESPC also distributes OGDRs generated by EUMETSAT from the European Usingen ground station.

PRODUCT INFORMATION

Jason-3 Level-2 Products

	OGDR Family	IGDR Family	GDR Family
Reduced 1Hz	OGDR-SSHA	IGDR-SSHA	GDR-SSHA
1 Hz + 20Hz	OGDR OGDR-BUFR*	IGDR	GDR
1Hz + 20HZ + Waveform		S-IGDR	S-GDR
Latency	3-5 Hours	1-2 Days	~ 90 Days

Size & Complexity

Latency and Accuracy

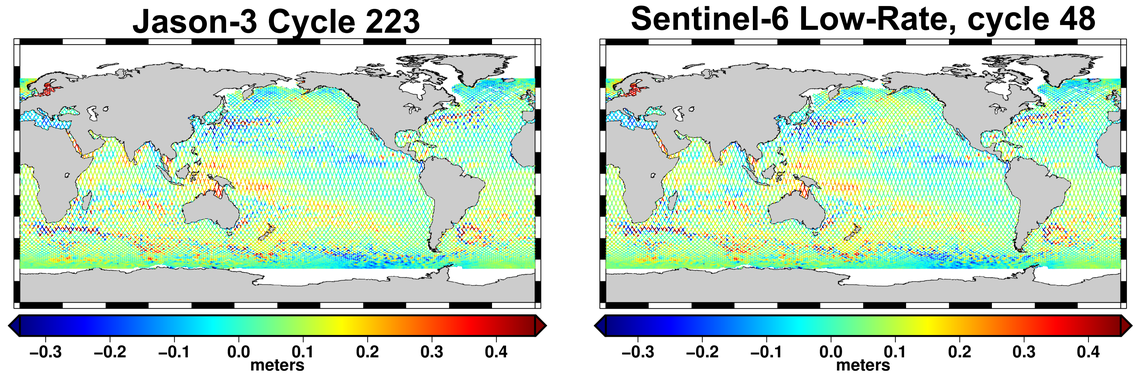
* All files in NetCDF format except OGDR-BUFR, which contains no 20-Hz data

OGDR = operational geophysical data record
IGDR = interim geophysical data record
GDR = (final, science quality) geophysical data record

See the **Jason-3 Handbook** for additional product information at
https://www.ncei.noaa.gov/sites/default/files/2021-01/Jason-3%20Products%20Handbook.pdf

National Centers for Environmental Information (NCEI) has established a data quality monitoring system for users to access graphic and numeric quality statistics and attributes for selected parameters in GDR or IGDR, which is available on the web at:
https://www.ncei.noaa.gov/products/jason-satellite-products

JASON-3 and Sentinel-6 (Low-Rate) INTERCOMPARISONS



Radar Altimeter Database System (RADS) plots for Jason-3 (cycle 223) and Sentinel-6 (cycle 48) covering from 2/26/2022 to 3/8/2022. RADS is employed at NESDIS/STAR as an enterprise multi-mission algorithm providing consistent sea level anomaly, waves, and ocean surface wind speed products. RADS was developed by NESDIS/STAR, EUMETSAT, and Department of Earth Observation and Space Systems - Delft University of Technology (Delft, Netherlands) (https://www.tudelft.nl/lr/organisatie/afdelingen/space-engineering/astrodynamics-and-space-missions). For more information on RADS, see https://www.star.nesdis.noaa.gov/socd/lsa/RADS.php

PRODUCT ACCESS

(1)Via Comprehensive Large Array-data Stewardship System (CLASS): http://www.class.noaa.gov *(all file types including orbit, auxiliary)*
See the **CLASS Tutorial** at http://www.class.noaa.gov/release/data_available/jason/jason2tutorial.html
(2) Via WMO Gateway (GTS) in BUFR format *(OGDR-BUFR only)* - Anyone with a GTS link should look for the following two WMO headers: NOAA (ISZX01 KNES) and EUMETSAT (ISZX01 EUMS) for Jason-2 OGDR-BUFR data in WMO/GTS bulletins/messages.
(3) Via ESPC PDA, Product Distribution and Access *(OGDR, OGDR-BUFR, & OGDR-SSHA)* To submit a request for ESPC PDA, contact ESPCoperations@noaa.gov.
(4) All level-2 X-GDRs can be downloaded through http, ftp, THREDDS servers from NCEI: https://www.ncei.noaa.gov/products/jason-satellite-products

National Oceanic and Atmospheric Administration (NOAA)
National Aeronautics and Space Administration (NASA) Jet Propulsion Laboratory (JPL)
Centre National d'Etudes Spatiales (CNES)
European Organization for the Exploitation of Meteorological Satellites (EUMETSAT)

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