

NetCDF Description for Near Real-Time Surface Currents

Produced by the HF-Radar Network

Original:
2021/03/26
Mark Otero

Edited:
2026/10/01
Brian Zelenke

In order to promote data distribution and interoperability, sea surface velocities computed in near real-time by the HF-Radar Network (HFRNet) are stored in a portable and self-describing format called Network Common Data Form (NetCDF). NetCDF is a data format with supporting software libraries and conventions that enable the creation, access, and sharing of scientific data. A full description of NetCDF including documentation, conventions and software is available from [Unidata](#).

Two conventions are used for organizing and describing surface currents stored in NetCDF. The [Climate and Forecast \(CF\) Metadata Convention](#) provides the majority of the framework for describing both the data and associated metadata including standardized attributes, units, and variable names. The [Attribute Convention for Dataset Discovery \(ACDD\)](#) is also followed in order to make data available to discovery systems such as the [Thematic Real-time Environmental Distributed Data Services \(THREDDS\)](#).

The following features were added in product version *2.0.00*:

- Updates for current versions of CF & ACDD metadata standards
- Updates to processing metadata
- Updates to contributing radial metadata
- Added depth as a scalar coordinate vertical variable
- Added time and depth bounds as cell boundaries
- Added the grid geoid
- Added the horizontal dilution of precision (HDOP)
- Added the number of sites and radials contributing to each total solution

The product version was revised to *v1r0* effective July 2025, when administration of HFRNet transitioned from the Scripps Institution of Oceanography's Coastal Observing Research & Development Center to the National Oceanic & Atmospheric Administration (NOAA) U.S. Integrated Ocean Observing System (IOOS) Office.

Questions and comments should be directed to [HFRNet administrators](#).

Appendix A: Sample product version v1r0 file header (effective after June 2025)

```
Source:
  \rtv-uswc-6km-uwls_v1r0_hfr_s202603091200000_e202603091200000_c202603100002177.nc
Format:
  netcdf4
Global Attributes:
  Conventions      = 'CF-1.12,ACDD-1.3'
  id_HFR           = '202603091200iooshfrowlsRTVuswc6km'
  id               = 'cebdd425-b0f6-46dd-83bd-243f31041bf7'
  date_created     = '2026-03-10T00:02:38Z'
  source           = 'RDLm_ANGL_2026_03_09_1200.ruv, RDLm_BIGC_2026_03_09_1200.ruv,
RDLm_CRIS_2026_03_09_1200.ruv, RDLm_EXPL_2026_03_09_1200.ruv,
RDLm_GCVE_2026_03_09_1200.ruv, RDLm_MONT_2026_03_09_1200.ruv,
RDLi_PBON_2026_03_09_1200.ruv, RDLm_PREY_2026_03_09_1200.ruv,
RDLm_PSLR_2026_03_09_1200.ruv, RDLm_RAGG_2026_03_09_1200.ruv,
RDLm_SAUS_2026_03_09_1200.ruv, RDLm_SCRZ_2026_03_09_1200.ruv,
RDLm_SHEL_2026_03_09_1200.ruv, RDLm_SLID_2026_03_09_1200.ruv,
RDLi_WLD2_2026_03_09_1200.ruv, RDLi_WSH1_2026_03_09_1200.ruv,
RDLi_YHL1_2026_03_09_1200.ruv, RDLi_YHS2_2026_03_09_1200.ruv,
RDLm_AGL1_2026_03_09_1200.ruv, RDLm_ARG1_2026_03_09_1200.ruv,
RDLm_BMLR_2026_03_09_1200.ruv, RDLm_COP1_2026_03_09_1200.ruv,
RDLm_DCLR_2026_03_09_1200.ruv, RDLm ESTR_2026_03_09_1200.ruv,
RDLm_GCYN_2026_03_09_1200.ruv, RDLm_LUIS_2026_03_09_1200.ruv,
RDLm_MBAC_2026_03_09_1200.ruv, RDLm_MGS1_2026_03_09_1200.ruv,
RDLm_MLML_2026_03_09_1200.ruv, RDLm_NIC1_2026_03_09_1200.ruv,
RDLm_PAFS_2026_03_09_1200.ruv, RDLm_PILR_2026_03_09_1200.ruv,
RDLm_PPNS_2026_03_09_1200.ruv, RDLm_PTC1_2026_03_09_1200.ruv,
RDLm_PTM1_2026_03_09_1200.ruv, RDLm_RFG1_2026_03_09_1200.ruv,
RDLm_SCCI_2026_03_09_1200.ruv, RDLi_SCDB_2026_03_09_1200.ruv,
RDLm_SCDH_2026_03_09_1200.ruv, RDLm_SCI1_2026_03_09_1200.ruv,
RDLm_SCNB_2026_03_09_1200.ruv, RDLi_SCPF_2026_03_09_1200.ruv,
RDLi_SCTB_2026_03_09_1200.ruv, RDLm_SDBP_2026_03_09_1200.ruv,
RDLi_SDCP_2026_03_09_1200.ruv, RDLm_SDDP_2026_03_09_1200.ruv,
RDLm_SDPL_2026_03_09_1200.ruv, RDLm_SDSC_2026_03_09_1200.ruv,
RDLm_SDSL_2026_03_09_1200.ruv, RDLm_SDSN_2026_03_09_1200.ruv,
RDLm_SDWW_2026_03_09_1200.ruv, RDLm_SNI1_2026_03_09_1200.ruv,
RDLm SSD1_2026_03_09_1200.ruv, RDLi_WIN1_2026_03_09_1200.ruv,
RDLm_WSP1_2026_03_09_1200.ruv'
  program          = 'Integrated Ocean Observing System (IOOS)'
```

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project          = 'NESDIS Common Cloud Framework.'
title            = 'Near-Real Time Surface Ocean Velocity, U.S. West Coast, 6km
                  Resolution'
summary          = 'Surface ocean velocities estimated from HF-Radar are representative
                  of the upper 2.4 meters of the ocean. The main objective of near-real
                  time processing is to produce the best product from available data at
                  the time of processing. Radial velocity measurements are obtained from
                  individual radar sites through the U.S. HF-Radar Network. Hourly radial
                  data are processed by unweighted least squares on a 6km resolution grid
                  of the U.S. West Coast to produce near real-time surface current maps.'

instrument        = 'OCEAN SURFACE CURRENT RADAR'
keywords          = 'NOAA, IOOS, CODAR SeaSonde, Earth Science, Oceans, Coastal
                  Processes, Marine Environment Monitoring, Ocean Circulation, Ocean
                  Currents, Surface Currents, Wind-Driven Circulation, Tides, Tidal
                  Currents, Pacific Ocean, North Pacific Ocean'

geospatial_lat_min    = 30.25
geospatial_lat_max    = 49.992
geospatial_lat_resolution = '6 km'
geospatial_lat_units   = 'degrees_north'
geospatial_lon_min    = -130.36
geospatial_lon_max    = -115.8056
geospatial_lon_resolution = '6 km'
geospatial_lon_units   = 'degrees_east'
processing_level        = 'NOAA Level 3. Near real-time dataset with automated data acquisition
                  and processing quality control.'

history          = 'HFRNet v1r0'
references        = 'Terrill, E. et al., 2006. Data Management and Real-time Distribution
                  in the HF-Radar National Network. Proceedings of the MTS/IEEE Oceans
                  2006 Conference, Boston MA, September 2006.'

Institution        = 'DOC/NOAA/NESDIS/OSPO > Office of Satellite and Product Operations,
                  NESDIS, NOAA, U.S. Department of Commerce.'

creator_type        = 'institution'
creator_name        = 'NOAA IOOS Surface Currents Program'
creator_email        = 'data.ioos@noaa.gov'
creator_url          = 'https://ioos.noaa.gov/project/hf-radar/'
naming_authority     = 'gov.noaa.nesdis.ncei'
standard_name_vocabulary = 'CF Standard Name Table, Version 89'
keywords_vocabulary   = 'Global Change Master Directory (GCMD) Keywords, Version 21.2'
instrument_vocabulary = 'Global Change Master Directory (GCMD) Keywords, Version 21.2'
format_version        = '2.0.00'
product_version      = 'v1r0'

```

```

time_coverage_start      = '2026-03-09T12:00:00Z'
time_coverage_end        = '2026-03-09T12:00:00Z'
cdm_data_type            = 'Grid'
day_night_data_flag      = 'both'
metadata_link            = 'https://cdn.ioos.noaa.gov/media/2017/12/hfradar_nodc_sep_2014.pdf'
platform                 = 'CODAR SeaSonde, COASTAL STATIONS'
platform_vocabulary      = 'Global Change Master Directory (GCMD) Keywords, Version 21.2'
production_environment   = 'INT'
production_site          = 'PLAIT'
publisher_email          = 'espcoperations@noaa.gov'
publisher_type           = 'institution'
publisher_name           = 'DOC/NOAA/NESDIS/OSPO > Office of Satellite and Product Operations,
                           NESDIS, NOAA, U.S. Department of Commerce.'
publisher_url            = 'http://www.ospo.noaa.gov'

Dimensions:
  time = 1      (UNLIMITED)
  lat  = 367
  lon  = 234
  nv   = 2

Variables:
  time
    Size:          1x1
    Dimensions:    time
    Datatype:      int32
    Attributes:
      standard_name = 'time'
      units         = 'seconds since 1970-01-01'
      calendar      = 'gregorian'
      bounds        = 'time_bnds'

  lat
    Size:          367x1
    Dimensions:    lat
    Datatype:      single
    Attributes:
      standard_name = 'latitude'
      units         = 'degrees_north'

  lon
    Size:          234x1
    Dimensions:    lon
    Datatype:      single
    Attributes:

```

```

        standard_name = 'longitude'
        units          = 'degrees_east'
time_bnds
    Size:          2x1
    Dimensions:    nv,time
    Datatype:      int32
depth
    Size:          1x1
    Dimensions:
    Datatype:      single
    Attributes:
        standard_name = 'depth'
        units         = 'm'
        positive      = 'down'
        axis          = 'Z'
        bounds        = 'depth_bnds'
        comment        = 'Nominal depth (and corresponding bounds) based on contributing
radars'
depth_bnds
    Size:          2x1
    Dimensions:    nv
    Datatype:      single
wgs84
    Size:          1x1
    Dimensions:
    Datatype:      int8
    Attributes:
        grid_mapping_name      = 'latitude_longitude'
        longitude_of_prime_meridian = 0
        semi_major_axis        = 6378137
        inverse_flattening      = 298.2572
u
    Size:          234x367x1
    Dimensions:    lon,lat,time
    Datatype:      int16
    Attributes:
        _FillValue      = -32767
        standard_name    = 'surface_eastward_sea_water_velocity'
        units            = 'm s-1'
        scale_factor      = 0.01
        grid_mapping      = 'wgs84'

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        coordinates      = 'depth'
        cell_methods      = 'depth: mean time: mean'
        ancillary_variables = 'dopx'

v
Size:      234x367x1
Dimensions: lon,lat,time
Datatype:  int16
Attributes:
    _FillValue      = -32767
    standard_name    = 'surface_northward_sea_water_velocity'
    units            = 'm s-1'
    scale_factor     = 0.01
    grid_mapping      = 'wgs84'
    coordinates      = 'depth'
    cell_methods      = 'depth: mean time: mean'
    ancillary_variables = 'dopy'

dopx
Size:      234x367x1
Dimensions: lon,lat,time
Datatype:  int16
Attributes:
    _FillValue      = -32767
    long_name        = 'longitudinal dilution of precision'
    comment          = 'The longitudinal dilution of precision (dopx) represents the
                        contribution of radial geometry to uncertainty in the eastward velocity
                        estimate (u).'
    scale_factor     = 0.01
    grid_mapping      = 'wgs84'
    coordinates      = 'depth'

dopy
Size:      234x367x1
Dimensions: lon,lat,time
Datatype:  int16
Attributes:
    _FillValue      = -32767
    long_name        = 'latitudinal dilution of precision'
    comment          = 'The latitudinal dilution of precision (dopy) represents the
                        contribution of radial geometry to uncertainty in the northward
                        velocity estimate (v).'
    scale_factor     = 0.01
    grid_mapping      = 'wgs84'

```

```

        coordinates      = 'depth'
hdop
    Size:      234x367x1
    Dimensions: lon,lat,time
    Datatype:  int16
    Attributes:
        _FillValue      = -32767
        long_name        = 'horizontal dilution of precision'
        comment          = 'The horizontal dilution of precision (hdop) is the vector
                           length (magnitude) of the eastward (dopx) and northward (dopy)
                           dilution of precision.  It represents the contribution of radial
                           geometry to the overall uncertainty in the total velocity (u and
                           v) estimate.'
        scale_factor     = 0.01
        grid_mapping      = 'wgs84'
        coordinates      = 'depth'
        ancillary_variables = 'dopx dopy'
number_of_sites
    Size:      234x367x1
    Dimensions: lon,lat,time
    Datatype:  int8
    Attributes:
        _FillValue      = -127
        long_name        = 'number of contributing radars'
        units            = 'count'
        comment          = 'Number of radars contributing radials to the total solution'
        grid_mapping      = 'wgs84'
        coordinates      = 'depth'
number_of_radials
    Size:      234x367x1
    Dimensions: lon,lat,time
    Datatype:  int16
    Attributes:
        _FillValue      = -32767
        long_name        = 'number of contributing radials'
        units            = 'count'
        comment          = 'Number of radials contributing to the total solution'
        grid_mapping      = 'wgs84'
        coordinates      = 'depth'
processing_parameters
    Size:      1x1

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Dimensions:
Datatype:  int8
Attributes:
    long_name                = 'Methods and parameters used to compute total
                              solutions'
    combine_method_name      = 'Unweighted Least Squares'
    combine_method_description = 'Method used to compute total solutions from radial
                              velocities'
    grid_search_radius       = 10
    grid_search_radius_units = 'km'
    grid_search_radius_description = 'Search radius used for finding contributing radial
                              velocities'
    max_radial_speed         = 100
    max_radial_speed_units   = 'cm s-1'
    max_radial_speed_description = 'Maximum radial speed allowed to contribute to
                              total solutions'
    max_rtv_speed           = 100
    max_rtv_speed_units     = 'cm s-1'
    max_rtv_speed_description = 'Maximum allowed total speed'
    min_radar_sites         = 2
    min_radar_sites_description = 'Minimum number of radar sites required to make a
                              total solution'
    min_radials             = 3
    min_radials_description  = 'Minimum number of radials required to make a
                              solution'
    max_hdop                = 1.25
    max_hdop_description    = 'Maximum allowed HDOP'
radial_metadata
    Size: 1x1
    Dimensions:
    Datatype:  int8
    Attributes:
        long_name                = 'Metadata on radial velocities used to compute
                              total solutions'
        number_files_loaded      = 55
        number_files_loaded_description = 'Number of radial files loaded'
        files_loaded             = 'RDLm_ANGL_2026_03_09_1200.ruv,
                              RDLm_BIGC_2026_03_09_1200.ruv,
                              RDLm_CRIS_2026_03_09_1200.ruv,
                              RDLm_EXPL_2026_03_09_1200.ruv,
                              RDLm_GCVE_2026_03_09_1200.ruv,'

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RDLm_MONT_2026_03_09_1200.ruv,
RDLi_PBON_2026_03_09_1200.ruv,
RDLm_PREY_2026_03_09_1200.ruv,
RDLm_PSLR_2026_03_09_1200.ruv,
RDLm_RAGG_2026_03_09_1200.ruv,
RDLm_SAUS_2026_03_09_1200.ruv,
RDLm_SCRZ_2026_03_09_1200.ruv,
RDLm_SHEL_2026_03_09_1200.ruv,
RDLm_SLID_2026_03_09_1200.ruv,
RDLi_WLD2_2026_03_09_1200.ruv,
RDLi_WSH1_2026_03_09_1200.ruv,
RDLi_YHL1_2026_03_09_1200.ruv,
RDLi_YHS2_2026_03_09_1200.ruv,
RDLm_AGL1_2026_03_09_1200.ruv,
RDLm_ARG1_2026_03_09_1200.ruv,
RDLm_BMLR_2026_03_09_1200.ruv,
RDLm_COP1_2026_03_09_1200.ruv,
RDLm_DCLR_2026_03_09_1200.ruv,
RDLm ESTR_2026_03_09_1200.ruv,
RDLm_GCYN_2026_03_09_1200.ruv,
RDLm_LUIS_2026_03_09_1200.ruv,
RDLm_MBAC_2026_03_09_1200.ruv,
RDLm_MGS1_2026_03_09_1200.ruv,
RDLm_MLML_2026_03_09_1200.ruv,
RDLm_NIC1_2026_03_09_1200.ruv,
RDLm_PAFS_2026_03_09_1200.ruv,
RDLm_PILR_2026_03_09_1200.ruv,
RDLm_PPNS_2026_03_09_1200.ruv,
RDLm_PTC1_2026_03_09_1200.ruv,
RDLm_PTM1_2026_03_09_1200.ruv,
RDLm_RFG1_2026_03_09_1200.ruv,
RDLm_SCCI_2026_03_09_1200.ruv,
RDLi_SCDB_2026_03_09_1200.ruv,
RDLm_SCDH_2026_03_09_1200.ruv,
RDLm_SCI1_2026_03_09_1200.ruv,
RDLm_SCNB_2026_03_09_1200.ruv,
RDLi_SCPF_2026_03_09_1200.ruv,
RDLi_SCTB_2026_03_09_1200.ruv,
RDLm_SDBP_2026_03_09_1200.ruv,
RDLi_SDCP_2026_03_09_1200.ruv,
RDLm_SDDP_2026_03_09_1200.ruv,

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                                RDLm_SDPL_2026_03_09_1200.ruv,
                                RDLm_SDSC_2026_03_09_1200.ruv,
                                RDLm_SDSL_2026_03_09_1200.ruv,
                                RDLm_SDSN_2026_03_09_1200.ruv,
                                RDLm_SDWW_2026_03_09_1200.ruv,
                                RDLm_SNI1_2026_03_09_1200.ruv,
                                RDLm_SSD1_2026_03_09_1200.ruv,
                                RDLi_WIN1_2026_03_09_1200.ruv,
                                RDLm_WSP1_2026_03_09_1200.ruv'
                                = 'Radial file names loaded'

prod_mon      files_loaded_description
              Size:          1x1
              Dimensions:
              Datatype:      uint32
              Attributes:
                  long_name    = 'Total (actual) number of retrievals'

```

Appendix B: Sample product version 2.0.00 file header (used before July 2025)

```
Source:
  \202103091200_hfr_uswc_6km_rtv_uwls_SIO.nc
Format:
  netcdf4_classic
Global Attributes:
  Conventions      = 'ACDD-1.3,CF-1.7'
  id               = '202103091200siohfruwlsrtvuswc6km'
  date_created     = '2021-03-09T15:22:36Z'
  source           = 'surface ocean velocity field from hf-radar'
  program          = 'Integrated Ocean Observing System (IOOS)'
  title            = 'Near-Real Time Surface Ocean Velocity, U.S. West Coast, 6km Resolution'
  summary          = 'Surface ocean velocities estimated from HF-Radar are representative
of the upper 2.4 meters of the ocean. The main objective of
near-real time processing is to produce the best product from
available data at the time of processing. Radial velocity
measurements are obtained from individual radar sites through the
U.S. HF-Radar Network. Hourly radial data are processed by unweighted
least squares on a 6km resolution grid of the U.S. West Coast to
produce near real-time surface current maps.'
  Instrument       = 'Earth Remote Sensing Instruments, Active Remote Sensing,
Profilers/Sounders, Radar Sounders, Doppler RADAR'
  keywords         = 'Earth Science, Oceans, Sea Surface, Coastal Processes, Marine
Environment Monitoring, Ocean Circulation, Ocean Currents,
Wind-Driven Circulation, Tides, Tidal Currents, Pacific Ocean, North
Pacific Ocean'
  geospatial_lat_min = 30.25
  geospatial_lat_max = 49.992
  geospatial_lon_min = -130.36
  geospatial_lon_max = -115.8056
  processing_level    = 'Near real-time dataset with automated data acquisition and processing
quality control'
  history             = '2021-03-09T12:53:22Z hfrnet rtvMergeData: Saving 4 new solutions
2021-03-09T13:23:02Z hfrnet rtvMergeData: Saving 1787 solutions; 1787
new or updated, 0 unmodified from previous run(s)
2021-03-09T13:53:05Z hfrnet rtvMergeData: Saving 2678 solutions; 1886
new or updated, 792 unmodified from previous run(s)
2021-03-09T14:22:41Z hfrnet rtvMergeData: Saving 5017 solutions; 4340
new or updated, 677 unmodified from previous run(s)
2021-03-09T14:52:43Z hfrnet rtvMergeData: Saving 9704 solutions; 7298
```

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new or updated, 2406 unmodified from previous run(s)
2021-03-09T15:22:36Z hfrnet rtvMergeData: Saving 9704 solutions; 7
new or updated, 9697 unmodified from previous run(s)
2021-03-09T15:22:36Z hfrnet rtvSaveNetcdf: Removed 1530 solutions
exceeding HDOP threshold of 1.25'

references
= 'Terrill, E. et al., 2006. Data Management and Real-time Distribution
in the HF-Radar National Network. Proceedings of the MTS/IEEE Oceans
2006 Conference, Boston MA, September 2006.'

Institution
= 'Coastal Observing Research and Development Center, Scripps
Institution of Oceanography'

creator_type
= 'group'
creator_name
= 'HFRNet Administrators'
creator_email
= 'hfrnet.administrators@sio.ucsd.edu'
creator_url
= 'http://cordc.ucsd.edu/projects/mapping/'
naming_authority
= 'edu.ucsd.cordc'
standard_name_vocabulary
= 'CF Standard Name Table, Version 51'
keywords_vocabulary
= 'Global Change Master Directory (GCMD) Keywords, Version 8.6'
instrument_vocabulary
= 'Global Change Master Directory (GCMD) Keywords, Version 8.6'
format_version
= '1.1.00'
product_version
= '2.0.00'

Dimensions:
time = 1      (UNLIMITED)
lat  = 367
lon  = 234
nv   = 2

Variables:
time
    Size:      1x1
    Dimensions: time
    Datatype:   int32
    Attributes:
        standard_name = 'time'
        units          = 'seconds since 1970-01-01'
        calendar       = 'gregorian'
        bounds         = 'time_bnds'

lat
    Size:      367x1
    Dimensions: lat
    Datatype:   single
    Attributes:
        standard_name = 'latitude'

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```

        units = 'degrees_north'
lon
    Size:          234x1
    Dimensions: lon
    Datatype:      single
    Attributes:
        standard_name      = 'longitude'
        units               = 'degrees_east'
time_bnds
    Size:          2x1
    Dimensions: nv,time
    Datatype:      int32
depth
    Size:          1x1
    Dimensions:
    Datatype:      single
    Attributes:
        standard_name      = 'depth'
        units              = 'm'
        bounds             = 'depth_bnds'
        comment            = 'Nominal depth (and corresponding bounds) based on contributing
                                radars'
depth_bnds
    Size:          2x1
    Dimensions: nv
    Datatype:      single
wgs84
    Size:          1x1
    Dimensions:
    Datatype:      int8
    Attributes:
        grid_mapping_name   = 'latitude_longitude'
        longitude_of_prime_meridian = 0
        semi_major_axis     = 6378137
        inverse_flattening   = 298.2572
u
    Size:          234x367x1
    Dimensions: lon,lat,time
    Datatype:      int16
    Attributes:
        standard_name      = 'surface_eastward_sea_water_velocity'

```

```

        units                = 'm s-1'
        _FillValue           = -32767
        scale_factor         = 0.01
        grid_mapping          = 'wgs84'
        coordinates          = 'depth'
        cell_methods         = 'depth: mean time: mean'
        ancillary_variables   = 'dopx'
v
Size:          234x367x1
Dimensions: lon,lat,time
Datatype:      int16
Attributes:
    standard_name          = 'surface_northward_sea_water_velocity'
    units                  = 'm s-1'
    _FillValue             = -32767
    scale_factor           = 0.01
    grid_mapping            = 'wgs84'
    coordinates            = 'depth'
    cell_methods           = 'depth: mean time: mean'
    ancillary_variables     = 'dopy'
dopx
Size:          234x367x1
Dimensions: lon,lat,time
Datatype:      int16
Attributes:
    long_name              = 'longitudinal dilution of precision'
    comment                 = 'The longitudinal dilution of precision (dopx) represents the
                             contribution of radial geometry to uncertainty in the eastward
                             velocity estimate (u).'
    _FillValue             = -32767
    scale_factor           = 0.01
    grid_mapping            = 'wgs84'
    coordinates            = 'depth'
dopy
Size:          234x367x1
Dimensions: lon,lat,time
Datatype:      int16
Attributes:
    long_name              = 'latitudinal dilution of precision'
    comment                 = 'The latitudinal dilution of precision (dopy) represents the
                             contribution of radial geometry to uncertainty in the northward

```

```

        _FillValue      = -32767
        scale_factor    = 0.01
        grid_mapping     = 'wgs84'
        coordinates     = 'depth'
hdop
    Size:                234x367x1
    Dimensions: lon,lat,time
    Datatype:   int16
    Attributes:
        long_name        = 'horizontal dilution of precision'
        comment          = 'The horizontal dilution of precision (hdop) is the vector
                           length (magnitude) of the eastward (dopx) and northward (dopy)
                           dilution of precision.  It represents the contribution of radial
                           geometry to the overall uncertainty in the total velocity (u and
                           v) estimate.'
        _FillValue      = -32767
        scale_factor    = 0.01
        grid_mapping     = 'wgs84'
        coordinates     = 'depth'
        ancillary_variables = 'dopx dopy'
number_of_sites
    Size:                234x367x1
    Dimensions: lon,lat,time
    Datatype:   int8
    Attributes:
        long_name        = 'number of contributing radars'
        units            = 'count'
        comment          = 'Number of radars contributing radials to the total solution'
        _FillValue      = -127
        grid_mapping     = 'wgs84'
        coordinates     = 'depth'
number_of_radials
    Size:                234x367x1
    Dimensions: lon,lat,time
    Datatype:   int16
    Attributes:
        long_name        = 'number of contributing radials'
        units            = 'count'
        comment          = 'Number of radials contributing to the total solution'
        _FillValue      = -32767

```

grid_mapping	= 'wgs84'
coordinates	= 'depth'
processing_parameters	
Size:	1x1
Dimensions:	
Datatype:	int8
Attributes:	
long_name	= 'Methods and parameters used to compute total solutions'
combine_method_name	= 'Unweighted Least Squares'
combine_method_description	= 'Method used to compute total solutions from radial velocities'
grid_search_radius	= 10
grid_search_radius_units	= 'km'
grid_search_radius_description	= 'Search radius used for finding contributing radial velocities'
max_radial_speed	= 100
max_radial_speed_units	= 'cm s-1'
max_radial_speed_description	= 'Maximum radial speed allowed to contribute to total solutions'
max_rtv_speed	= 100
max_rtv_speed_units	= 'cm s-1'
max_rtv_speed_description	= 'Maximum allowed total speed'
min_radar_sites	= 2
min_radar_sites_description	= 'Minimum number of radar sites required to make a total solution'
min_radials	= 3
min_radials_description	= 'Minimum number of radials required to make a solution'
max_hdop	= 1.25
max_hdop_description	= 'Maximum allowed HDOP'
radial_metadata	
Size:	1x1
Dimensions:	
Datatype:	int8
Attributes:	
long_name	= 'Metadata on radial velocities used to compute total solutions'
number_files_loaded	= 62
number_files_loaded_description	= 'Number of radial files loaded'
files_loaded	= 'RDL_m_BML_BML1_2021_03_09_1200.ruv'

RDL_m_BML_BRAG_2021_03_09_1200.ruv
RDL_m_BML_PAFS_2021_03_09_1200.ruv
RDL_m_BML_PBON_2021_03_09_1200.ruv
RDL_m_BML_PREY_2021_03_09_1200.ruv
RDL_m_BML_SLID_2021_03_09_1200.ruv
RDL_i_CODAR_ANGL_2021_03_09_1200.ruv
RDL_m_CODAR_BIGC_2021_03_09_1200.ruv
RDL_m_CODAR_CRIS_2021_03_09_1200.ruv
RDL_m_CODAR_EXPL_2021_03_09_1200.ruv
RDL_m_CODAR_FORT_2021_03_09_1200.ruv
RDL_m_CODAR_MONT_2021_03_09_1200.ruv
RDL_m_CODAR_PILR_2021_03_09_1200.ruv
RDL_m_CODAR_PSLR_2021_03_09_1200.ruv
RDL_m_CODAR_RTC1_2021_03_09_1200.ruv
RDL_m_CODAR_SAUS_2021_03_09_1200.ruv
RDL_m_BML_GCVE_2021_03_09_1200.ruv
RDL_m_BML_SHEL_2021_03_09_1200.ruv
RDL_m_BML_TRIN_2021_03_09_1200.ruv
RDL_i_OSU_CBL1_2021_03_09_1200.ruv
RDL_i_OSU_LOO1_2021_03_09_1200.ruv
RDL_i_OSU_PSG1_2021_03_09_1200.ruv
RDL_i_OSU_WIN1_2021_03_09_1200.ruv
RDL_i_OSU_WLD2_2021_03_09_1200.ruv
RDL_i_OSU_WSH1_2021_03_09_1200.ruv
RDL_i_OSU_YHL1_2021_03_09_1200.ruv
RDL_i_OSU_YHS2_2021_03_09_1200.ruv
RDL_i_SLO_AGL1_2021_03_09_1200.ruv
RDL_m_SLO_DCLR_2021_03_09_1200.ruv
RDL_m_SLO ESTR_2021_03_09_1200.ruv
RDL_m_SLO_FBK1_2021_03_09_1200.ruv
RDL_i_SLO_LUIS_2021_03_09_1200.ruv
RDL_m_SLO_PTC1_2021_03_09_1200.ruv
RDL_m_SLO_RAGG_2021_03_09_1200.ruv
RDL_m_UCSB_COP1_2021_03_09_1200.ruv
RDL_m_UCSB_RFG1_2021_03_09_1200.ruv
RDL_m_UCSB_SCI1_2021_03_09_1200.ruv
RDL_m_CODAR_GCYN_2021_03_09_1200.ruv
RDL_m_CODAR_MLML_2021_03_09_1200.ruv
RDL_m_CODAR_NPGS_2021_03_09_1200.ruv
RDL_m_CODAR_PPNS_2021_03_09_1200.ruv
RDL_m_CODAR_SCRZ_2021_03_09_1200.ruv

	RDL_m_ONC_VJOR_2021_03_09_1200.ruv
	RDL_m_ONC_VROC_2021_03_09_1200.ruv
	RDL_i_SIO_SDBP_2021_03_09_1200.ruv
	RDL_m_SIO_SDDP_2021_03_09_1200.ruv
	RDL_m_SIO_SDPL_2021_03_09_1200.ruv
	RDL_m_SIO_SDSC_2021_03_09_1200.ruv
	RDL_m_SIO_SDSL_2021_03_09_1200.ruv
	RDL_m_SIO_SDSN_2021_03_09_1200.ruv
	RDL_m_SIO_SDUT_2021_03_09_1200.ruv
	RDL_m_SIO_SDWW_2021_03_09_1200.ruv
	RDL_m_UCSB_NIC1_2021_03_09_1200.ruv
	RDL_i_UCSB_PTM1_2021_03_09_1200.ruv
	RDL_m_UCSB_SNI1_2021_03_09_1200.ruv
	RDL_m_USC_SCDB_2021_03_09_1200.ruv
	RDL_i_USC_SCDH_2021_03_09_1200.ruv
	RDL_m_USC_SCPF_2021_03_09_1200.ruv
	RDL_m_ONC_VCOL_2021_03_09_1200.ruv
	RDL_m_ONC_VGPT_2021_03_09_1200.ruv
	RDL_m_ONC_VION_2021_03_09_1200.ruv
	RDL_m_ONC_VATK_2021_03_09_1200.ruv'
files_loaded_description	= 'Radial file names