SWOT NetCDF files v1.0

The following document details the SWOT observation data format extracted from the Ohio River shapefiles and made available to all modules in the Confluence workflow.

SWOT NetCDF

Data organization

The SWOT NetCDF files are organized on the reach level with one file per reach as identified by SWORD. The data is organized into reach and node groups which hold data from each respective level.

Global Attributes

Name	Description	Value (if applicable)
title	Brief title of the file	
reach_id	Numeric identifier for the reach that also includes the basin	CBBBBBRRRRT (where C is continent, B is basin, R is reach, and T is type)
history	Date the file was created	Date (MM/DD/YYYY) Time (HH:MM:SS)
continent	The continent of the reach	

Dimensions

Name	Description	Value (if applicable)
nt	Time steps	Varies with each run
nx	Nodes	Varies by reach

Groups

reach
node

Variables

reach

		reach_id
	dimensions	None
	type	int64
	long_name	reach ID from prior river database
	comment	Unique reach identifier from the prior river database. The format of the identifier CBBBBBRRRRT where C = continent, B = basin, R = reach, and T = type).

		d_x_area
	dimensions	nt
	type	float
	long_name	Change in cross-sectional area
	units	m^2
	valid_min	-10000000
	valid_max	10000000
	fill_value	- 999999999999

		slope2
	dimensions	nt
	type	float
	long_name	Enhanced water surface slope with respect to geoid
	units	m/m
	valid_min	-0.001
	valid_max	0.1
	fill_value	- 999999999999

		width
	dimensions	nt
	type	float
	long_name	reach width
	units	m
	valid_min	0.0
	valid_max	100000
	fill_value	- 999999999999

		wse
	dimensions	nt
	type	float
	long_name	water surface elevation with respect to the geoid
	units	m
	valid_min	-1000
	valid_max	100000
	fill_value	- 999999999999

		reach_q
	dimensions	nt
	type	int
	long_name	summary quality indicator for the reach
	flag_masks	TBD
	flag_meanings	good bad
	flag_values	0 1
	valid_min	0
	valid_max	1
	fill_value	-999

		dark_frac
	dimensions	nt
	type	int
	long_name	fractional area of dark water
	units	1
	valid_min	-1000
	valid_max	10000
	fill_value	-999999999999

		ice_clim_f
	dimensions	nt
	type	int
	long_name	climatological ice cover flag
	flag_meanings	no_ice_cover uncertain_ice_cover full_ice_cover
	flag_values	0 1 2
	valid_min	0
	valid_max	2
	fill_value	-999

		ice_dyn_f
	dimensions	nt
	type	int
	long_name	dynamical ice cover flag
	flag_meanings	no_ice_cover uncertain_ice_cover full_ice_cover
	flag_values	0 1 2
	valid_min	0
	valid_max	2
	fill_value	-999

		partial_f
	dimensions	nt
	type	int
	long_name	partial reach coverage flag
	flag_meanings	covered not_covered
	flag_values	0 1
	valid_min	0
	valid_max	1
	fill_value	-999

		n_good_nod
	dimensions	nt
	type	int
	long_name	number of nodes in the reach that have a valid WSE
	units	1
	valid_min	0
	valid_max	100
	fill_value	-999

		obs_frac_n
	dimensions	nt
	type	int
	long_name	fraction of nodes that have a valid WSE
	units	1
	valid_min	0
	valid_max	1
	fill_value	- 999999999999

		xovr_cal_q
	dimensions	nt
	type	int
	long_name	quality of the cross-over calibration
	flag_masks	TBD
	flag_meanings	T B D
	flag_values	0T B D
	valid_min	0
	valid_max	1
	fill_value	-999

node

		reach_id
	dimensions	None
	type	int64
	long_name	reach ID from prior river database
	comment	Unique reach identifier from the prior river database. The format of the identifier is CBBBBBRRRRT, where C=continent, B=basin, R=reach, T=type.

		node_id
	dimensions	nx
	type	int64
	long_name	node ID of the node in the prior river database
	comment	Unique node identifier from the prior river database. The format of the identifier is CBBBBBRRRRNNNT, where C=continent, B=basin, R=reach, N=node, T=type.

		d_x_area
	dimensions	nx by nt
	type	float
	long_name	Change in cross-sectional area
	units	m^2
	valid_min	-10000000
	valid_max	10000000
	fill_value	- 999999999999

		slope2
	dimensions	nx by nt
	type	float
	long_name	Enhanced water surface slope with respect to geoid
	units	m/m
	valid_min	-0.001
	valid_max	0.1
	fill_value	- 999999999999

		width
	dimensions	nx by nt
	type	float
	long_name	node width
	units	m
	valid_min	0.0
	valid_max	100000
	fill_value	- 999999999999

		wse
	dimensions	nx by nt
	type	float
	long_name	water surface elevation with respect to the geoid
	units	m
	valid_min	-1000
	valid_max	100000
	fill_value	- 999999999999

		node_q
	dimensions	nx by nt
	type	int
	long_name	summary quality indicator for the node
	flag_masks	TBD
	flag_meanings	good bad
	flag_values	0 1
	valid_min	0
	valid_max	1
	fill_value	-999

		dark_frac
	dimensions	nx by nt
	type	int
	long_name	fractional area of dark water
	units	1
	valid_min	-1000
	valid_max	10000
	fill_value	-999999999999

		ice_clim_f
	dimensions	nx by nt
	type	int
	long_name	climatological ice cover flag
	flag_meanings	no_ice_cover uncertain_ice_cover full_ice_cover
	flag_values	0 1 2
	valid_min	0
	valid_max	2
	fill_value	-999

		ice_dyn_f
	dimensions	nx by nt
	type	int
	long_name	dynamical ice cover flag
	flag_meanings	no_ice_cover uncertain_ice_cover full_ice_cover
	flag_values	0 1 2
	valid_min	0
	valid_max	2
	fill_value	-999

		partial_f
	dimensions	nx by nt
	type	int
	long_name	partial node coverage flag
	flag_meanings	covered not_covered
	flag_values	0 1
	valid_min	0
	valid_max	1

	fill_value	-999

		n_good_pix
	dimensions	nx by nt
	type	int
	long_name	number of pixels that have a valid WSE
	units	1
	valid_min	0
	valid_max	100000
	fill_value	-999

		xovr_cal_q
	dimensions	nx by nt
	type	int
	long_name	quality of the cross-over calibration
	flag_masks	TBD
	flag_meanings	T B D
	flag_values	0T B D
	valid_min	0
	valid_max	1
	fill_value	-999