## **XBeach Standard Names**

For more info on XBeach please refer to https://public.deltares.nl/display/XBEACH/Home

## XBeach names

XBeach name	standard_name	variable name
(m) x-coord. comp. grid (positive shoreward, perp. to coastline)		
(m) y-coord. comp. grid		
(m) x-coord. comp. grid (positive shoreward, perp. to coastline)		
(m) y-coord. comp. grid		
(m) x-coord. in u points		
(m) y-coord. in v points		
(m) world x-coordinates	projection_x_coordinate (CF)	
(m) world y-coordinates	projection_y_coordinate (CF)	
(m) grid size x-direction		
(m) grid size y-direction		
(m) x-origin of grid in world coordinates		
(m) y-origin of grid in world coordinates		
(rad) (deg on input) angle of grid w.r.t. East		
depths defined positive downwards (1) or upwards(-1)	(attribute in depth variable CF)	
(rad) minimum angle of computational wave grid (carth. in rad)		
(rad) minimum angle of computational wave grid (carth. in rad)		
local number of grid cells x-direction		
local number of grid cells y-direction		
(m) bed level		
(m) initial bed level	sea_surface_height_above_geoid (CF) (at t=0)	
(m) initial bed level (rad) wave angles directional distribution w.r.t. comp. x-axis		
	t=0)	
(rad) wave angles directional distribution w.r.t. comp. x-axis	t=0)	
(rad) wave angles directional distribution w.r.t. comp. x-axis <ul> <li>number of wave direction bins</li> </ul>	t=0)	· ·
(rad) wave angles directional distribution w.r.t. comp. x-axis         Image: mathematical content of the state of th	t=0)	
<ul> <li>(rad) wave angles directional distribution w.r.t. comp. x-axis</li> <li>number of wave direction bins</li> <li>(rad) wave direction bin size</li> <li>(rad) mean incident wave angle</li> </ul>	t=0)	· · ·
<ul> <li>(rad) wave angles directional distribution w.r.t. comp. x-axis</li> <li>number of wave direction bins</li> <li>(rad) wave direction bin size</li> <li>(rad) mean incident wave angle</li> <li>cos(theta)</li> </ul>	t=0)	· · ·
<ul> <li>(rad) wave angles directional distribution w.r.t. comp. x-axis</li> <li>number of wave direction bins</li> <li>(rad) wave direction bin size</li> <li>(rad) mean incident wave angle</li> <li>cos(theta)</li> <li>sin(theta)</li> </ul>	t=0)	· · ·
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<ul> <li>(rad) wave angles directional distribution w.r.t. comp. x-axis</li> <li>number of wave direction bins</li> <li>(rad) wave direction bin size</li> <li>(rad) mean incident wave angle</li> <li>cos(theta)</li> <li>sin(theta)</li> <li>(rad) mean wave angle</li> <li>(N/m2) wave force x-direction</li> <li>(N/m2) wave force y-direction</li> </ul>	t=0)	
<ul> <li>(rad) wave angles directional distribution w.r.t. comp. x-axis</li> <li>number of wave direction bins</li> <li>(rad) wave direction bin size</li> <li>(rad) mean incident wave angle</li> <li>cos(theta)</li> <li>sin(theta)</li> <li>(rad) mean wave angle</li> <li>(N/m2) wave force x-direction</li> <li>(N/m2) wave force y-direction</li> <li>(N/m2) wave force y-direction</li> <li>(N/m) radiation stress</li> </ul>	t=0)	
<ul> <li>(rad) wave angles directional distribution w.r.t. comp. x-axis</li> <li>number of wave direction bins</li> <li>(rad) wave direction bin size</li> <li>(rad) mean incident wave angle</li> <li>cos(theta)</li> <li>sin(theta)</li> <li>(rad) mean wave angle</li> <li>(N/m2) wave force x-direction</li> <li>(N/m2) wave force y-direction</li> <li>(N/m2) wave force y-direction</li> <li>(N/m) radiation stress</li> <li>(N/m) radiation stress</li> </ul>	t=0)	
<ul> <li>(rad) wave angles directional distribution w.r.t. comp. x-axis</li> <li>number of wave direction bins</li> <li>(rad) wave direction bin size</li> <li>(rad) mean incident wave angle</li> <li>cos(theta)</li> <li>sin(theta)</li> <li>(rad) mean wave angle</li> <li>(N/m2) wave force x-direction</li> <li>(N/m2) wave force y-direction</li> <li>(N/m2) wave force y-direction</li> <li>(N/m) radiation stress</li> <li>(N/m) radiation stress</li> <li>(N/m) radiation stress</li> </ul>	t=0)	
<ul> <li>(rad) wave angles directional distribution w.r.t. comp. x-axis</li> <li>number of wave direction bins</li> <li>(rad) wave direction bin size</li> <li>(rad) mean incident wave angle</li> <li>cos(theta)</li> <li>sin(theta)</li> <li>(rad) mean wave angle</li> <li>(N/m2) wave force x-direction</li> <li>(N/m2) wave force y-direction</li> <li>(N/m2) wave force y-direction</li> <li>(N/m) radiation stress</li> </ul>	t=0)	
(rad) wave angles directional distribution w.r.t. comp. x-axis <ul> <li>number of wave direction bins</li> <li>(rad) wave direction bin size</li> <li>(rad) mean incident wave angle</li> <li>cos(theta)</li> <li>sin(theta)</li> <li>(rad) mean wave angle</li> <li>(N/m2) wave force x-direction</li> <li>(N/m2) wave force y-direction</li> <li>(N/m2) wave force y-direction</li> <li>(N/m) radiation stress</li> <li>(N/m) wave height</li> </ul>	t=0)	
(rad) wave angles directional distribution w.r.t. comp. x-axis <ul> <li>number of wave direction bins</li> <li>(rad) wave direction bin size</li> <li>(rad) mean incident wave angle</li> <li>cos(theta)</li> <li>sin(theta)</li> <li>(rad) mean wave angle</li> <li>(N/m2) wave force x-direction</li> <li>(N/m2) wave force y-direction</li> <li>(N/m2) wave force y-direction</li> <li>(N/m) radiation stress</li> <li>(N/m) radiation stress</li> <li>(N/m) radiation stress</li> <li>(N/m) radiation stress</li> <li>(N/m) wave height</li> <li>(m/s) group velocity x-direction</li> </ul>	t=0)	
(rad) wave angles directional distribution w.r.t. comp. x-axis <ul> <li>number of wave direction bins</li> <li>(rad) wave direction bin size</li> <li>(rad) mean incident wave angle</li> <li>cos(theta)</li> <li>sin(theta)</li> <li>(rad) mean wave angle</li> <li>(N/m2) wave force x-direction</li> <li>(N/m2) wave force y-direction</li> <li>(N/m2) wave force y-direction</li> <li>(N/m) radiation stress</li> <li>(n) wave height</li> <li>(m) wave height</li> <li>(m/s) group velocity x-direction</li> </ul>	t=0)	

(J/m2/rad) directionally distributed wave energy	
(rad) wave angles	
cos of wave angles	
sin of wave angles	
(rad/s) relative frequency	
(J/m2/rad) directionally distributed roller energy	
(rad/m) wave number	
(m/s) wave celerity	
(m/s) group velocity	
(rad/s) mean frequency	
(rad/s) mean abs frequency	
(m) water depth	sea_floor_depth_below_sea_level
(m) water level	sea_surface_height_above_geoid (CF)
(m) water level due to tide alone	
(s) input time of input tidal signal	
(m) input tidal signal	
(s) input time of input wind signal	
(m/s) input wind velocity	
(deg nautical) input wind direction	
(m/s) uniform wind velocity current time	
(m/s) uniform wind direction current time	
(m/s) rate of change water level	
(m/s) water surface gradient in x-direction	
(m/s) water surface gradient in y-direction	
bed level gradient in x-direction	
😑 bed level gradient in y-direction	
(m/s) rate of change bed level	
(m/s) (GLM) x-velocity in u-points	
(m/s) (GLM) y-velocity in v-points	
(m2/s) x-discharge in u-points	
(m2/s) y-discharge in u-points	
(m) cum. sedimentation/erosion	
(kg/m3/m) bed concentration gradient x-dir.	
(kg/m3/m) bed concentration gradient y-dir.	
(kg/m3/m) suspended concentration gradient x-dir.	
(kg/m3/m) suspended concentration gradient y-dir.	
(m/s) incident bound wave velocity	
(Nm/m2) wave energy	
(Nm/m2) roller energy	
(m/s) orbital velocity	
(W/m2) dissipation	
fraction breaking waves	
(m/s) Stokes drift	
(rad) mean wave direction	
(m/s) Eulerian mean velocity x-dir.	
(m/s) Eulerian mean velocity y-dir.	
(m/s) (GLM) velocity magnitude u-points	

(m/s) (GLM) velocity magnitude u-points	
(m/s) (GLM) velocity magnitude v-points	
(m/s) (GLM) velocity magnitude v-points	
(m/s) (GLM) x-velocity cell centre (for output)	
(m/s) (GLM) y-velocity cell centre (for output)	
(m/s) Eulerian mean x-velocity cell centre (for output)	
(m/s) Eulerian mean y-velocity cell centre (for output)	
(m) water depth previous time step	
emask wet/dry u-points	
mask wet/dry v-points	
emask wet/dry eta-points	
(m) water depth in u-points	
(m) water depth in v-points	
(m) water depth in u-points	
(m) water depth in v-points	
(m/s) velocity magnitude in cell centre	
(m3/m3) depth-averaged concentration for each sediment fraction	
(m/s) x-comp. Stokes drift	
(m/s) y-comp. Stokes drift	
(m/s) return flow due to roller	
(m/s) return flow due to roller after breaker delay	
(m) incoming bound long wave	
(W/m2) roller energy dissipation	
(m/s) longterm mean velocity at bnds in x-direction	
(m/s) longterm mean velocity at bnds in y-direction	
0 = uniform grid size, 1 = variable grid size	
(m/s) y velocity in u points	
(m/s) x velocity in v points	
(m) D50 grain diameters for all sediment classses	
(m) D90 grain diameters for all sediment classses	
equilibrium sediment concentartion factor for each sediment class	
control of the c	
<ul> <li>(s) sediment response time for each sediment class</li> <li>(m2/s) suspended sediment transport x-dir. for each sediment class (excluding pores)</li> </ul>	
(m2/s) suspended sediment transport y-dir. for each sediment class (excluding pores)	
(m2/s) bed sediment transport x-dir. for each sediment class (excluding pores)	
(m2/s) bed sediment transport y-dir. for each sediment class (excluding pores)	
(m3/m3) depth-averaged bed equilibrium concentration for each sediment class	
(m3/m3) depth-averaged suspended equilibrium concentration for each sediment class	
(m/s) time averaged flow velocity due to wave assymetry	
maximum wave surface slope used in roller dissipation formulation	
(m^2/s^2) near bed turbulence intensity due to depth induces breaking	
(s) wave period interval associated with breaking induced turbulence	
(m) total bed level change due to avalanching	
(m) maximum elevation in simulation	
(m) minimum elevation in simulation for subroutine dispersion	

(m) groundwater table (min(zb.gwhead))         (m) vertical size of aquifer through which groundwater can flow         (m) level of the bottom of the aquifer         (m/s) groundwater flow in x-direction         (m/s) groundwater flow in x-direction         (m/s) groundwater flow in x-direction (interaction between surface and ground water)         (m) Infiltration layer depth used in quasi-vertical flow model for groundwater         (m) boundary condition back boundary for groundwater head         (m/s2/sh2) depth averaged turbulence intensity due to long wave breaking         (m/s2/sh2) depth averaged turbulence intensity due to long wave breaking         (m/s2/sh2) depth averaged turbulence intensity due to long wave breaking         (m/s2/sh2) depth averaged turbulence intensity due to long wave breaking         (m/s2/sh2) depth averaged) for raction         (m/s2/sh2) depth averaged) for raction         (m/s2/sh2) depth averaged) for raction         (m/s2/sh2) depth averaged) for wci         (m/s) u-velocity (time-averaged) for wci         (m) waterlevel (time-averaged) for wci         (m/s2/sh2) normalized dynamic pressure         (m/s) vertical velocity at the bottom         (m/s2/sh2) component of bed shear stress         (N/m*2) -component of bed shear stress         (N/m*2) v-component of bed shear stress         (N/m*2) vasipation rate due to bed friction		
mg groundwater head (differs from gwlevel)         (m) groundwater table (min(zb.gwhead))           (m) vertical size of aquifer through which groundwater can flow         (m) vertical size of aquifer through which groundwater can flow           (m) vertical size of aquifer through which groundwater can flow         (m) vertical size of aquifer through which groundwater can flow           (m) so proundwater flow in x-direction         (m/s) groundwater flow in x-direction (interaction between surface and ground water)           (m/s) groundwater flow in x-direction (interaction between surface and ground water)         (m) Infiltration layer depth used in quasi-vertical flow model for groundwater           (m) Infiltration layer depth used in quasi-vertical flow model for groundwater         (m/s) which groundwater perform           (m/s) groundwater flow in x-direction         (m/s) supplicit bed deposition rate per fraction           (m/s) seplicit bed layers (can be different for each computational cell)         (m/s) unplicit bed layers (can be different for each computational cell)           (m/s) unplicit bed layers (can be different for each computational cell)         (m/s) unplicit bed layers (can be different for each computational cell)           (m/s) unplicit bed layers (can be different for each computational cell)         (m/s) unplicit bed layers (can be different for each computational cell)           (m/s) unplicit bed layers (can be different for each computational cell)         (m/s) unplicit bed layers (can be different for each computational cell)           (m/s) unplicit bed layers (can b	eskewness of short waves	
(m) groundwater table (min(zb.gwhead))         (m) vertical size of aquifer through which groundwater can flow         (m) level of the bottom of the aquifer         (m/s) groundwater flow in x-direction         (m/s) groundwater flow in x-direction         (m/s) groundwater flow in x-direction (interaction between surface and ground water)         (m) Infiltration layer depth used in quasi-vertical flow model for groundwater         (m) boundary condition back boundary for groundwater head         (m/s2/sh2) depth averaged turbulence intensity due to long wave breaking         (m/s2/sh2) depth averaged turbulence intensity due to long wave breaking         (m/s2/sh2) depth averaged turbulence intensity due to long wave breaking         (m/s2/sh2) depth averaged turbulence intensity due to long wave breaking         (m/s2/sh2) depth averaged) for raction         (m/s2/sh2) depth averaged) for raction         (m/s2/sh2) depth averaged) for raction         (m/s2/sh2) depth averaged) for wci         (m/s) u-velocity (time-averaged) for wci         (m) waterlevel (time-averaged) for wci         (m/s2/sh2) normalized dynamic pressure         (m/s) vertical velocity at the bottom         (m/s2/sh2) component of bed shear stress         (N/m*2) -component of bed shear stress         (N/m*2) v-component of bed shear stress         (N/m*2) vasipation rate due to bed friction	e asymmetry of short waves	
(m) vertical size of aquifer through which groundwater can flow       (m)	(m) groundwater head (differs from gwlevel)	
(m) level of the bottom of the aquifer         (m/s) groundwater flow in x-direction         (m/s) groundwater flow in y-direction         (m/s) groundwater flow in z-direction (interaction between surface and ground water)         (m) Infiltration layer depth used in quasi-vertical flow model for groundwater         (m) Londary condition back boundary for groundwater head         (m^22s^2) depth averaged turbulence intensity due to long wave breaking         (m/s) bed erosion rate per fraction         (m/s) explicit bed deposition rate per fraction         (m/s) explicit bed deposition rate per fraction         (m/s) uvelocity (time-averaged) for wci         (m/s) uvelocity (time-averaged) for wci         (m/s) vertical velocity at the bottom         (m/s) vertical velocity at the free surface         (N/m^2) x-component of bed shars stress         (N/m^2) x-component of bed shars stress         (M/m^2) dissipation rate use to bed friction         (m/s2) sediment transport integrated over bed load and suspended and for all sediment grains         (m/3m3) Sediment transport integrated over bed load and suspended and for all sediment grains         (m/s) 1 Vertical velocity at the bottom waves2         (m/s) 1 Surface elevation at boundary due to (short) waves2	(m) groundwater table (min(zb,gwhead))	
(m/s) groundwater flow in x-direction       (m/s)         (m/s) groundwater flow in y-direction (interaction between surface and ground water)       (m/s)         (m) Infiltration layer depth used in quasi-vertical flow model for groundwater       (m/s)         (m) boundary condition back boundary for groundwater head       (m/s)         (m/s) groundwater per fraction       (m/s)         (m/s) explicit bed deposition rate per fraction       (m/s)         (m/s) explicit bed deposition rate per fraction       (m/s)         (m/s) u-velocity (time-averaged) for wei       (m/s)         (m/s) u-velocity (time-averaged) for wei       (m/s)         (m/s) vertical velocity at the bottom       (m/s)         (m/s) vertical velocity (time-averaged) for wei       (m/s)         (m/s) vertical velocity at the free surface       (m/s)         (m/s) vertical velocity at the bottom       (m/s)         (m/s) vertical velocity at the free surface       (m/s)         (M/m2) -component of bed shear stress       (M/m2)         (M/m2) sediment transport integrated over bed load and suspended and for all sediment grains       (m/s)         (m/s) Sediment transport integrated over bed load and suspended and for all sediment grains       (m/s)         (m/s) Sediment transport integrated over bed load and suspended and for all sediment grains       (m/s)         (m/s) Sediment transport int	(m) vertical size of aquifer through which groundwater can flow	
(m/s) groundwater flow in y-direction         (m/s) groundwater flow in z-direction (interaction between surface and ground water)         (m) Infiltration layer depth used in quasi-vertical flow model for groundwater         (m) boundary condition back boundary for groundwater head         (m) boundary condition back boundary for groundwater head         (m/s) bed erosion rate per fraction         (m/s) explicit bed deposition rate per fraction         (m/s) explicit bed deposition rate per fraction         (m/s) u-velocity (time-averaged) for wci         (m) long wave roller thickness         (m/s) v-velocity (time-averaged) for wci         (m/s) v-velocity (time-avera	(m) level of the bottom of the aquifer	
(m/s) groundwater flow in z-direction (interaction between surface and ground water)         (m) Infiltration layer depth used in quasi-vertical flow model for groundwater         (m) boundary condition back boundary for groundwater head         (m/z)/s/2) depth averaged turbulence intensity due to long wave breaking         (m/z)/s/2) depth averaged turbulence intensity due to long wave breaking         (m/z)/s/2) depth averaged turbulence intensity due to long wave breaking         (m/s) implicit bed deposition rate per fraction         (m/s) explicit bed deposition rate per fraction         (m/s) u-velocity (time-averaged) for wci         (m/s) u-velocity (time-averaged) for wci         (m/s) v-velocity (time-averaged) for wci         (m/s) v-velocity (time-averaged) for wci         (m/s) vertical velocity at the bottom         (m/s) vertical velocity at the free surface         (N/m^2) x-component of bed shear stress         (N/m^2) y-component of bed shear stress         (N/m^2) y-component of bed shear stress         (M/m^2) Sediment transport integrated over bed load and suspended and for all sediment grains         (m/s)/s) ! Vertical velocity at boundary due to (short) waves2         (m) ! Surface elevation at boundary due to (short) waves	(m/s) groundwater flow in x-direction	
(m) Infiltration layer depth used in quasi-vertical flow model for groundwater         (m) boundary condition back boundary for groundwater head         (m*/2)s*2) depth averaged turbulence intensity due to long wave breaking         (m*/s) bed erosion rate per fraction         (m/s) implicit bed deposition rate per fraction         (m/s) explicit bed deposition rate per fraction         (m/s) explicit bed deposition rate per fraction         (m/s) explicit bed deposition rate per fraction         (m/s) uvelocity (time-averaged) for wei         (m) long wave roller thickness         (m/s) vvelocity (time-averaged) for wei         (m/s) vertical velocity at the bottom         (m/s) vertical velocity at the bottom         (m/s) vertical velocity at the free surface         (N/m*2) -component of bed shear stress         (W/m*2) dissipation rate due to bed friction         (m2/s) Sediment transport integrated over bed load and suspended and for all sediment grains         (m2/s) Sediment transport integrated over bed load and suspended and for all sediment grains         (m2/s) Sediment transport integrated over bed load and suspended and for all sediment grains         (m3/m3) Sediment transport integrated over bed load and suspended and for all sediment grains         (m3/m3) Sediment transport integrated over bed load and suspended and for all sediment grains         (m3/m3) Sediment toncentration integrated over bed load and suspended and for al	(m/s) groundwater flow in y-direction	
(m) boundary condition back boundary for groundwater head       (m*2/s*2) depth averaged turbulence intensity due to long wave breaking         (m*2/s*2) depth averaged turbulence intensity due to long wave breaking       (m*s)         (m*s) implicit bed deposition rate per fraction       (m*s)         (m*s) explicit bed intervent (time-averaged) for wci       (m*s)         (m*s) v-velocity at the bottom       (m*s)         (m*s) v-velocity at the bottom       (m*s)         (m*s) v-velocity at the free surface       (N/m*2) s-component of bed shear stress         (N/m*2) s-component of bed shear stress       (N/m*2)         (W/m*2) dissipation rate due to bed friction       (m2)         (m2)       Sediment transport integrated over bed load and suspended and for all sediment	(m/s) groundwater flow in z-direction (interaction between surface and ground water)	
(m²2/s²2) depth averaged turbulence intensity due to long wave breaking         (m/s²) bed erosion rate per fraction         (m/s²) implicit bed deposition rate per fraction         • number of bed layers (can be difefrent for each computational cell)         (m/s²) u-velocity (time-averaged) for wci         (m/s²) v-velocity (time-averaged) for wci         (m²/s²/s²2) normalized dynamic pressure         (m²/s²/s²2) normalized dynamic pressure         (m/s²) v-velocity at the bottom         (m/s²) v-component of bed shear stress         (N/m²2) x-component of bed shear stress         (N/m²2) y-component of bed shear stress         (m²2/s²) Sediment transport integrated over bed load and suspended and for all sediment grains         (m²/s²) Sediment concentration integrated over bed load and suspended and for all sediment grains         (m²/s) Sediment concentration integrated over bed load and suspended and for all sediment grains         (m²/s) Sediment concentration integrated over bed load and suspended and for all sediment grains         (m²/s) Sediment concentration integrated over bed load and suspended and for all sediment grains         (m²/s) Sediment concentration integrated over bed load and suspended and for all sediment grains         (m/s) ! Surface elevation at boundary due to (shor	(m) Infiltration layer depth used in quasi-vertical flow model for groundwater	
(m/s) bed erosion rate per fraction         (m/s) implicit bed deposition rate per fraction         ● number of bed layers (can be different for each computational cell)         (m/s) u-velocity (time-averaged) for wci         (m) long wave roller thickness         (m/s) v-velocity (time-averaged) for wci         (m/s) v-velocity at the bottom         (m²/s^2) normalized dynamic pressure         (m/s) v-trical velocity at the bottom         (m/s2) v-component of bed shear stress         (N/m^2) v-component of bed shear stress         (N/m^2) v-component of bed shear stress         (N/m^2) v-component of bed shear stress         (m/s/s) Sediment transport integrated over bed load and suspended and for all sediment grains         (m2/s) Sediment concentration integrated over bed load and suspended and for all sediment grains         (m/s/m3) Sediment concentration integrated over bed load and suspended and for all sediment grains         (m/s/s) 1 Vertical velocity at boundary due to (short) waves2         (m) 1 Surface elevation at boundary due to (short) waves	(m) boundary condition back boundary for groundwater head	
(m/s) implicit bed deposition rate per fraction         (m/s) explicit bed deposition rate per fraction         Implicit bed layers (can be diferent for each computational cell)         (m/s) u-velocity (time-averaged) for wci         (m) long wave roller thickness         (m/s) v-velocity (time-averaged) for wci         (m) waterlevel (time-averaged) for wci         (m/s) v-velocity (time-averaged) for wci         (m/s) vertical velocity at the bottom         (m/s) vertical velocity at the bottom         (m/s) v-omponent of bed shear stress         (N/m^2) x-component of bed shear stress         (W/m^2) dissipation rate due to bed friction         (m/s) Sediment transport integrated over bed load and suspended and for all sediment grains         (m/s) Sediment concentration integrated over bed load and suspended and for all sediment grains         (m/s) 1 Vertical velocity at boundary due to (short) waves2         (m/s) 1 Surface elevation at boundary due to (short) waves	(m^2/s^2) depth averaged turbulence intensity due to long wave breaking	
(m/s) explicit bed deposition rate per fraction         Image: number of bed layers (can be difefrent for each computational cell)         (m/s) u-velocity (time-averaged) for wci         (m) long wave roller thickness         (m/s) v-velocity (time-averaged) for wci         (m/s) v-velocity (time-averaged) for wci         (m) waterlevel (time-averaged) for wci         (m/s) v-velocity (time-averaged) for wci         (m/s) v-velocity at the averaged) for wci         (m/s) v-velocity at the bottom         (m/s) v-trical velocity at the bottom         (m/s) v-component of bed shear stress         (N/m^2) x-component of bed shear stress         (N/m^2) y-component of bed shear stress         (W/m^2) dissipation rate due to bed friction         (m/s/s) Sediment transport integrated over bed load and suspended and for all sediment grains         (m/s/s) Sediment concentration integrated over bed load and suspended and for all sediment grains         (m/s) ! Vertical velocity at boundary due to (short) waves2         (m) ! Surface elevation at boundary due to (short) waves	(m/s) bed erosion rate per fraction	
number of bed layers (can be difefrent for each computational cell)         (m/s) u-velocity (time-averaged) for wci         (m) long wave roller thickness         (m/s) v-velocity (time-averaged) for wci         (m/s) v-velocity (time-averaged) for wci         (m) waterlevel (time-averaged) for wci         (m/s) varical velocity at the bottom         (m/s) vertical velocity at the free surface         (N/m²2) x-component of bed shear stress         (N/m²2) y-component of bed shear stress         (W/m²2) dissipation rate due to bed friction         (m2/s) Sediment transport integrated over bed load and suspended and for all sediment grains         (m3/m3) Sediment concentration integrated over bed load and suspended and for all sediment grains         (m/s)! Vertical velocity at boundary due to (short) waves2         (m/s)! Vertical velocity at boundary due to (short) waves	(m/s) implicit bed deposition rate per fraction	
(m/s) u-velocity (time-averaged) for wci         (m) long wave roller thickness         (m/s) v-velocity (time-averaged) for wci         (m/s) v-velocity (time-averaged) for wci         (m) waterlevel (time-averaged) for wci         (m/x) v-velocity (time-averaged) for wci         (m/x) v-velocity (time-averaged) for wci         (m/x) v-velocity (time-averaged) for wci         (m/x) v-telocity at the overaged) for wci         (m/x) v-trical velocity at the bottom         (m/s) vertical velocity at the bottom         (m/s) vertical velocity at the free surface         (N/m^2) x-component of bed shear stress         (N/m^2) y-component of bed shear stress         (W/m^2) dissipation rate due to bed friction         (m2/s) Sediment transport integrated over bed load and suspended and for all sediment grains         (m2/s) Sediment concentration integrated over bed load and suspended and for all sediment grains         (m3/m3) Sediment concentration integrated over bed load and suspended and for all sediment grains         (m/s) ! Vertical velocity at boundary due to (short) waves2         (m) ! Surface elevation at boundary due to (short) waves	(m/s) explicit bed deposition rate per fraction	
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(m/s) v-velocity (time-averaged) for wci         (m) waterlevel (time-averaged) for wci         (m) waterlevel (time-averaged) for wci         (m^2/s^2) normalized dynamic pressure         (m/s) vertical velocity at the bottom         (m/s) vertical velocity at the bottom         (m/s) vertical velocity at the free surface         (N/m^2) x-component of bed shear stress         (N/m^2) y-component of bed shear stress         (W/m^2) dissipation rate due to bed friction         (m2/s) Sediment transport integrated over bed load and suspended and for all sediment grains         (m3/m3) Sediment concentration integrated over bed load and suspended and for all sediment grains         (m/s) ! Vertical velocity at boundary due to (short) waves2         (m) ! Surface elevation at boundary due to (short) waves	(m/s) u-velocity (time-averaged) for wci	
(m) waterlevel (time-averaged) for wci         (m/2/s^2) normalized dynamic pressure         (m/s) vertical velocity at the bottom         (m/s) vertical velocity at the free surface         (N/m^2) x-component of bed shear stress         (N/m^2) y-component of bed shear stress         (W/m^2) dissipation rate due to bed friction         (m2/s) Sediment transport integrated over bed load and suspended and for all sediment grains         (m3/m3) Sediment concentration integrated over bed load and suspended and for all sediment grains         (m/s) ! Vertical velocity at boundary due to (short) waves2         (m) ! Surface elevation at boundary due to (short) waves	(m) long wave roller thickness	
(m^2/s^2) normalized dynamic pressure         (m/s) vertical velocity at the bottom         (m/s) vertical velocity at the free surface         (m/s) vertical velocity at the free surface         (N/m^2) x-component of bed shear stress         (N/m^2) y-component of bed shear stress         (N/m^2) y-component of bed shear stress         (N/m^2) dissipation rate due to bed friction         (m2/s) Sediment transport integrated over bed load and suspended and for all sediment grains         (m3/m3) Sediment concentration integrated over bed load and suspended and for all sediment grains         (m/s) ! Vertical velocity at boundary due to (short) waves2         (m) ! Surface elevation at boundary due to (short) waves	(m/s) v-velocity (time-averaged) for wci	
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(m/s) vertical velocity at the free surface         (N/m^2) x-component of bed shear stress         (N/m^2) y-component of bed shear stress         (W/m^2) dissipation rate due to bed friction         (m2/s) Sediment transport integrated over bed load and suspended and for all sediment grains         (m3/m3) Sediment concentration integrated over bed load and suspended and for all sediment grains         (m3/m3) Sediment concentration integrated over bed load and suspended and for all sediment grains         (m/s) ! Vertical velocity at boundary due to (short) waves2         (m) ! Surface elevation at boundary due to (short) waves	(m^2/s^2) normalized dynamic pressure	
(N/m^2) x-component of bed shear stress         (N/m^2) y-component of bed shear stress         (W/m^2) dissipation rate due to bed friction         (m2/s) Sediment transport integrated over bed load and suspended and for all sediment grains         (m2/s) Sediment transport integrated over bed load and suspended and for all sediment grains         (m3/m3) Sediment concentration integrated over bed load and suspended and for all sediment grains         (ms) ! Vertical velocity at boundary due to (short) waves         (m) ! Surface elevation at boundary due to (short) waves	(m/s) vertical velocity at the bottom	
(N/m^2) y-component of bed shear stress         (W/m^2) dissipation rate due to bed friction         (m2/s) Sediment transport integrated over bed load and suspended and for all sediment grains         (m2/s) Sediment transport integrated over bed load and suspended and for all sediment grains         (m3/m3) Sediment concentration integrated over bed load and suspended and for all sediment grains         (m/s) ! Vertical velocity at boundary due to (short) waves2         (m) ! Surface elevation at boundary due to (short) waves	(m/s) vertical velocity at the free surface	
(W/m^2) dissipation rate due to bed friction       (m2/s) Sediment transport integrated over bed load and suspended and for all sediment grains         (m2/s) Sediment transport integrated over bed load and suspended and for all sediment grains       (m3/m3) Sediment concentration integrated over bed load and suspended and for all sediment grains         (m3/m3) Sediment concentration integrated over bed load and suspended and for all sediment grains       (m3/m3) Sediment concentration integrated over bed load and suspended and for all sediment grains         (m/s) ! Vertical velocity at boundary due to (short) waves2       (m) ! Surface elevation at boundary due to (short) waves	(N/m^2) x-component of bed shear stress	
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grains (m/s) ! Vertical velocity at boundary due to (short) waves2 (m) ! Surface elevation at boundary due to (short) waves	(m2/s) Sediment transport integrated over bed load and suspended and for all sediment grains	
(m) ! Surface elevation at boundary due to (short) waves	(m3/m3) Sediment concentration integrated over bed load and suspended and for all sediment grains	
	(m/s) ! Vertical velocity at boundary due to (short) waves2	
(m2/s) horizontal viscosity coefficient	(m) ! Surface elevation at boundary due to (short) waves	
	(m2/s) horizontal viscosity coefficient	