All the waves we refer to here are *wind generated gravity waves* with period *O*(1 sec-1 min) and wavelength *O*(1-500 m).

Sea state, also referred to as "total", is a combination of wind-sea and swell waves.

Wind-sea are waves driven by the local winds.

Swell are waves that are no longer being driven by winds and have traveled away from the wind generation area.

				Unit
1	hs	Significant wave height **total wave height**	swh	m
2	phs0	**Wind-sea** significant wave height **wind-sea wave height**	**wind-sea** swh	m
3	phs1	**Swell** significant wave height **swell wave height**	**swell** swh	m
4	thm	Mean wave direction **total mean direction**	mean wave direction	degrees
5	pdir0	**Wind-sea** mean direction	**wind-sea** direction	degrees
6	pdir1	**Swell** mean direction	**swell** direction	degrees
7	Tm1	Mean wave period of the first moment **average period of the highest waves**	period of the most energetic waves	s
8	pTm10	**Wind-sea** mean wave Tm1 period	**wind-sea** period	s
9	pTm11	**Swell** mean wave Tm1 period	**swell** period	s
10	tm02	Mean wave period of the second moment **total mean period**	average period of all waves	s
11	fp0	Peak frequency **frequency of the waves that occur more often**	peak frequency	1/s
12	lamult	Enhancement factor to the turbulent velocity scale, scaled	Langmuir number	[]

		by the Langmuir number (*La*) where: $La=\sqrt{\frac{Friction\,velocity}{\lvert(S.\,Stokes\,Drift)\rvert}}$		
13	foc	wave to ocean energy flux $foc=\rho_w g\iint S_{diss}\,d\omega\,d\theta$	proxy for wave dissipation	W/m²
14	faw	wind to wave energy flux $faw=\rho_w g\iint S_{inp}\,d\omega\,d\theta$	proxy for wave growth	W/m²
15	charn	Sea-state Charnock parameter **non-dimensional roughness length**	Charnock	[]
16	u_v	Wind at 10 meters	wind	m/s
17	ustokes_vstokes	Surface Stokes drift **wave induced surface velocity**	Stokes drift	m/s
18	tusx_tusy	Stokes transport **wave induced transport**	Stokes transport	m²/s²
19	tauicex_tauicey	Wave to sea ice stress $\tau_{ice}=\rho_w g\iint\frac{-S_{ice}}{\omega/k}(\cos(\theta),\sin(\theta))\,d\omega\,d\theta$	wave to sea ice stress	m²/s²
20	cu-cv	Surface ocean currents	surface ocean currents	m/s
21	ifrac	Sea Ice Concentration	SIC	[]
22	thick	Sea Ice thickness	SIT	m
23	corr hs/u_v	Correlation between wind speed and total significant wave height	correlation between wind speed and wave height	[]
24	stokes_depth	Stokes depth = $D_s=\frac{1}{2k}$ where $\omega=\frac{2*\pi}{Tm1}$ and $k=\frac{\omega^2}{g}$ **depth of wave influence.**	Stokes depth	m

		N.B. Under the ice, where only low frequency waves exist, wave heights are very small, *O*(cm), and Stokes depths are very large. In this situation the waves can be felt profoundly but the wave displacements are negligible.		
25	SD_dot_ST	Dot product between the unit vectors of the surface Stokes drift (SD) and Stokes Transport (ST). 1 = SD parallel ST 0 = SD perpendicular ST **unitary dot product between wave induced surface velocity and wave induced transport**	unitary dot product between Stokes Drift and Stokes transport.	[]
26	SD_currents	Ratio of Surface Stokes drift speed over surface ocean current speed. **(wave induced surface speed) / (surface ocean current speed)** **N.B. The scale is logarithmic**	Stokes drift surface speed over ocean surface current speed.	[]
27	angle_wind_wave	Angle between wind direction and mean wave direction. **N.B. Positive values mean wind direction is to the left of the wave direction.**	angle between wind and waves	degrees
28	degree_of_crossing	Degree of crossing is the cross product of the swell and wind sea over the total surface Stokes drift. **N.B. Positive values indicate wind-sea to the right of swell.**	The degree to which swell and wind sea directions diverge	[]
29	swell_persistence	Swell persistence is: $Ps = P\,[Ws > 0.5]$ = number of times where *Ws* is larger than 0.5 in a grid point divided by the total number of times. Where *Ws* is:	probability of the sea state to be swell dominated.	%

		$Ws = \left(\frac{swell\,swh}{total\,swh} \right)^2$ **times, in percentage, that energy of swell (which is proportional to swell height squared) is larger than the wind-sea energy.**		

30	iav	Inter Annual Variability is the standard deviation of the annual means normalized by the overall mean. $iav = \frac{\sigma_{\bar{x}_j}}{\bar{x}}$	variability from year to year	%
31	mav	Mean Annual variability is the average of the annual standard deviation normalized by the annual average. $mav = \overline{\left(\frac{\sigma_j}{\bar{x}_j} \right)}$	variability within each year	%