least every three hours, and fields 20, 23, 24, 31, 32 and 36-52 should be sampled at least every 6 hours.

Other variables are to be accumulated and then averaged.

Tier 2: Sub-daily output

Group 1: 3-hourly fields.
Fields 1-17 of the Tier 1 variables excepting 2, 3 and 9, plus 27.

State variables should be instantaneous, fluxes and cloud cover as averages.

Instantaneous = 1,5,6,7,8 and averages=4,10,12-17,27, and sum=11.

Group 2: 6-hourly fields.
Fields 18-55 of the Tier 1 variables excepting 26, 27 and 33.

Instantaneous = 20, 23, 24, 31, 32, 36-52, 56-57

Averages = 18, 19, 21, 22, 25, 28-30, 34, 35, 53-55

NetCDF Attributes to be used

	Variable	Long_name	Standard_name	unit
1	tas	Near-Surface Air Temperature	air_temperature	K
2	tasmax	Daily Maximum Near-Surface Air Temperature	air_temperature	K
3	tasmin	Daily Minimum Near-Surface Air Temperature	air_temperature	K
4	pr	Precipitation	precipitation_flux	kg m-2 s-1
5	psl	Sea Level Pressure	air_pressure_at_sea_level	Pa
6	ps	Surface Air pressure	surface_air_pressure	Pa
7	huss	Near-Surface Specific Humidity	specific_humidity	1
8	sfcWind	Near-Surface Wind Speed	wind_speed	m s-1
9	sfcWindmax	Daily Maximum Near-Surface Wind Speed	wind_speed	m s-1
10	clt	Total Cloud Fraction	cloud_area_fraction	%
11	sund	Duration Of Sunshine	duration_of_sunshine	s
12	rsds	Surface Downwelling Shortwave Radiation	surface_downwelling_shortwave_flux_in_air	W m-2
13	rlds	Surface Downwelling Longwave Radiation	surface_downwelling_longwave_flux_in_air	W m-2
14	hfls	Surface Upward Latent Heat Flux	surface_upward_latent_heat_flux	W m-2
15	hfss	Surface Upward Sensible Heat Flux	surface_upward_sensible_heat_flux	W m-2

16	rsus	Surface Upwelling Shortwave Radiation	surface_upwelling_shortwave_flux_in_air	W m-2
17	rlus	Surface Upwelling Longwave Radiation	surface_upwelling_longwave_flux_in_air	W m-2
18	evspsbl	Evaporation	water_evaporation_flux	kg m-2 s-1
19	mrfso	Soil Frozen Water Content	soil_frozen_water_content	kg m-2
20	mrros	Surface Runoff	surface_runoff_flux	kg m-2 s-1
21	mrro	Total Runoff	runoff_flux	kg m-2 s-1
22	mrso	Total Soil Moisture Content	soil_moisture_content	kg m-2
23	snw	Snow Amount	surface_snow_amount	kg m-2
24	prhmax	Daily Maximum Hourly Precipitation Rate	precipitation_flux	kg m-2 s-1
25	prc	Convective Precipitation	convective_precipitation_flux	kg m-2 s-1
26	rlut	TOA Outgoing Longwave Radiation	toa_outgoing_longwave_flux	W m-2
27	rsdt	TOA Incident Shortwave Radiation	toa_incoming_shortwave_flux	W m-2
28	rsut	TOA Outgoing Shortwave Radiation	toa_outgoing_shortwave_flux	W m-2
29	uas	Eastward Near-Surface Wind Velocity	eastward_wind	m s-1
30	vas	Northward Near-Surface Wind Velocity	northward_wind	m s-1
31	wsgsmax	Daily Maximum Near-Surface Wind Speed Of Gust	wind_speed_of_gust	m s-1
32	ts	Surface Temperature	surface_temperature	K
33	zmla	Height Of Boundary Layer	atmosphere_boundary_layer_thickness	m
34	prw	Water Vapor Path	atmosphere_water_vapor_content	kg m-2
35	clwvi	Condensed Water Path	atmosphere_cloud_condensed_water_content	kg m-2
36	clivi	Ice Water Path	atmosphere_cloud_ice_content	kg m-2
37	ua200, 500, 850	Eastward Wind	eastward_wind	m s-1
38	va200, 500, 850	Northward Wind	northward_wind	m s-1
39	ta200, 500, 850	Air Temperature	air_temperature	K
40	hus850	Specific Humidity	specific_humidity	1
41	zg200,500	Geopotential Height	geopotential_height	m
42	snm	Surface Snow Melt	surface_snow_melt_flux	kg m-2 s-1
43	snc	Snow Area Fraction	surface_snow_area_fraction	%
44	tauu	Surface Downward Eastward Wind Stress	surface_downward_eastward_stress	Pa
45	tauv	Surface Downward Northward Wind Stress	surface_downward_northward_stress	Pa
46	snd	Snow Depth	surface_snow_thickness	m
47	cll	Low Cloud Cover	cloud_area_fraction_in_atmosphere_layer	%

48	clm	Medium Cloud Cover	cloud_area_fraction_in_atmosphere_layer	%
49	clh	High Cloud Cover	cloud_area_fraction_in_atmosphere_layer	%
50	sftlf	Land Area Fraction	land_area_fraction	%
51	orog	Surface Altitude	surface_altitude	m
52	sic	Sea Ice Area Fraction	sea_ice_fraction	%
53	prsn	Snowfall Flux	snowfall_flux	kg m-2 s-1
54	evspsblpot	Potential Evapotranspiration	potential_water_evaporation_flux	kg m-2 s-1

Acknowledgments

Many people have contributed to these specifications, pointing out numerous inconsistencies and ambiguities. Particularly, Stephanie Legutke of the DKRZ and Martin Juckes of the BADC have given many suggestions. Many thanks to everyone!