# Assignment: PDD method

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PDD Model Parameters

I used the following influences to scale the temperature and precipitation field, respectively:

| Variable	Mechanisms	Value
Temperature	Latitudinal gradient	Linear gradient, North-South difference: 15°C
	Elevation	Lapse rate: 0.7°C/100m
	Seasonality	Cosine-function, winter-summer difference: 20°C
	Weather	Normal distribution with standard deviation of 3.5°C
Precipitation	Latitudinal gradient	Linear gradient, North-South difference: 4 mm/d
	Proximity to coast (?)	*Not yet implemented*

I derived the values for the different scalings from reanalysis data. I used ERA5 data from 2010 to 2019 to have a look at the annual mean temperature and precipitation in Greenland:

mean near-surface temperature

$\sigma_{T_s} = 3.5°C$

annual mean precipitation

$\overline{pr} = 1.6 \text{ mm d}^{-1}$
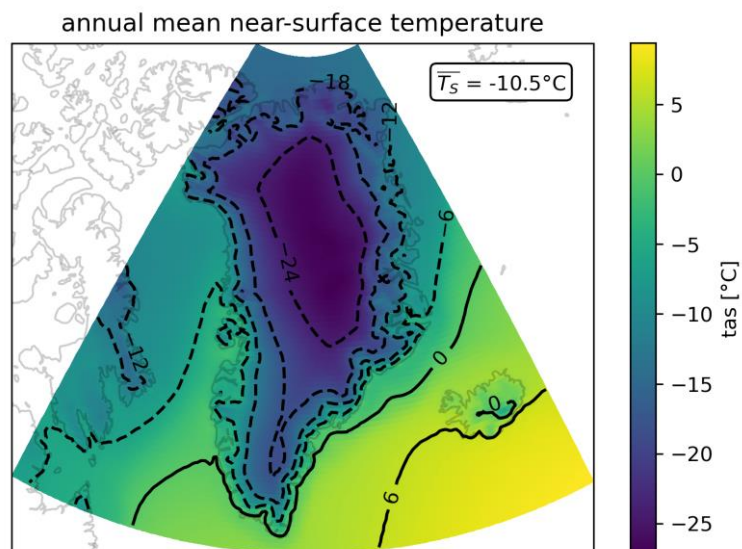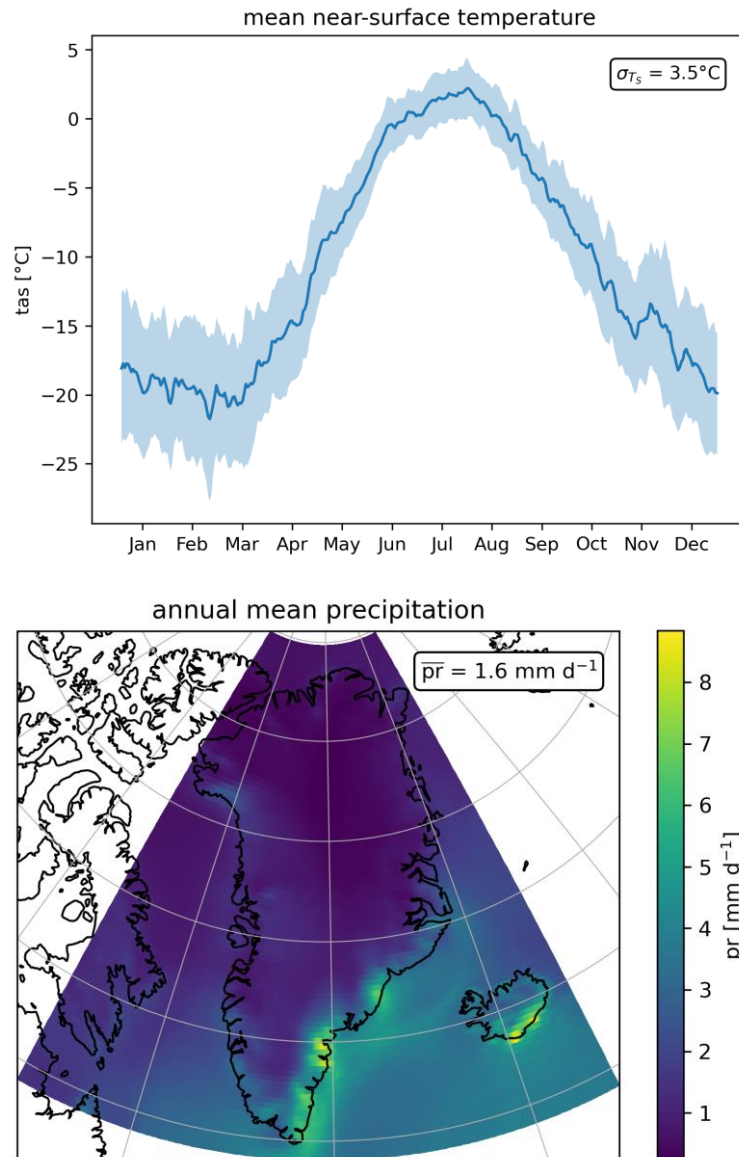
PDD Model Simulation

Then, I implemented the formulas for melting/ablation and accumulation. I chose beta = 8 mm/d/°C as this is the *ice* melting factor chosen in Seguinot, 2017, leading to this map of surface mass balance:

Surface mass balance (PDD model)
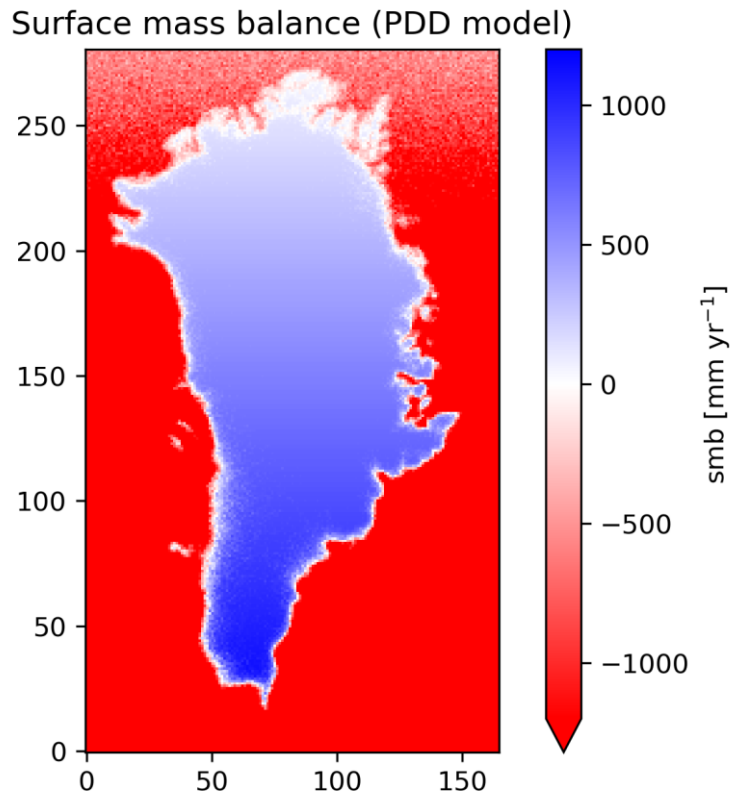
I have a feeling that the synthetic precipitation field is still lacking some mechanisms, hence, the surface mass balance only displays a negative linear gradient towards higher latitudes. I am looking forward to comparing the simulation results to those of other students, as I am not quite sure if these are the results we were expecting.