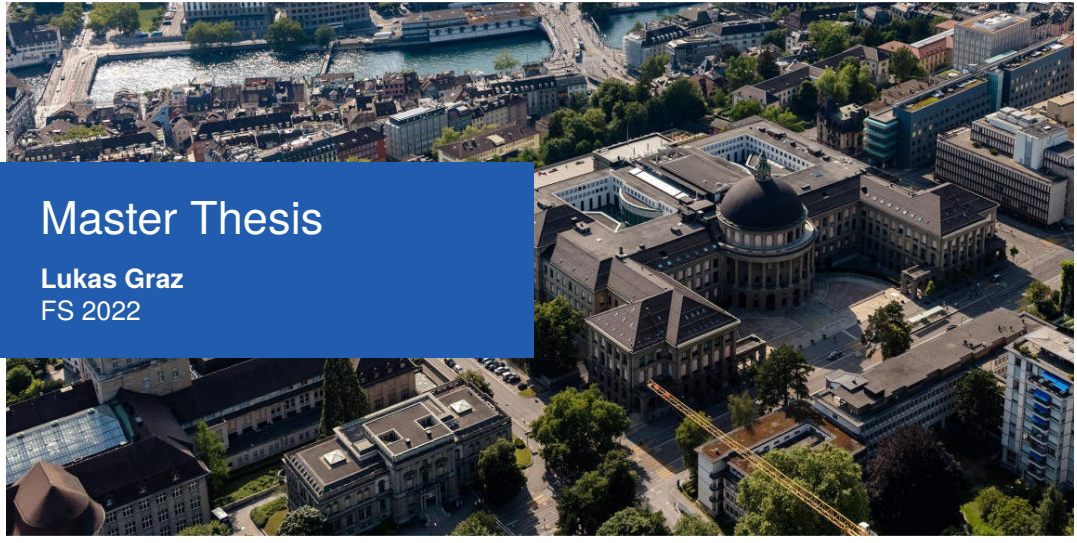
ETH zürich

D-MATH — Seminar for Statistics
D-USYS — Crop Science

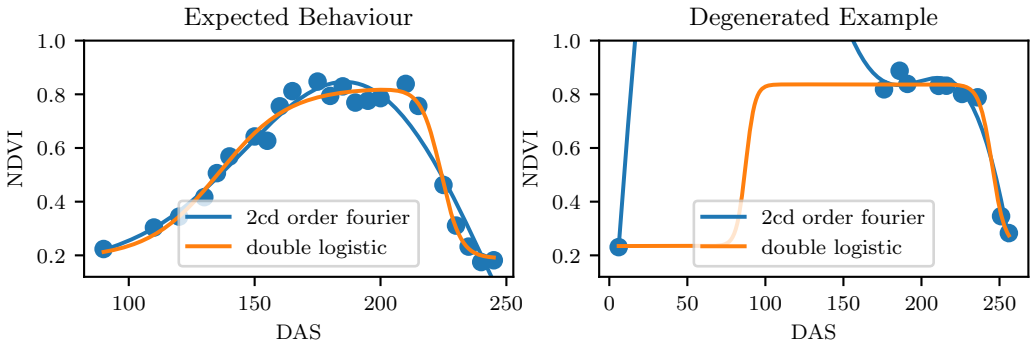


Master Thesis

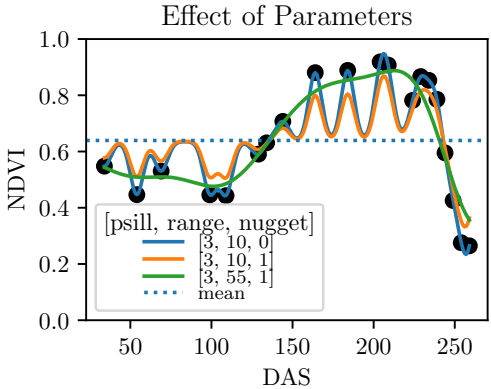
Lukas Graz

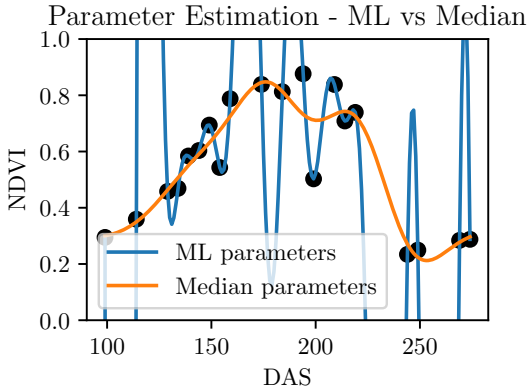
FS 2022

Parametric Curve

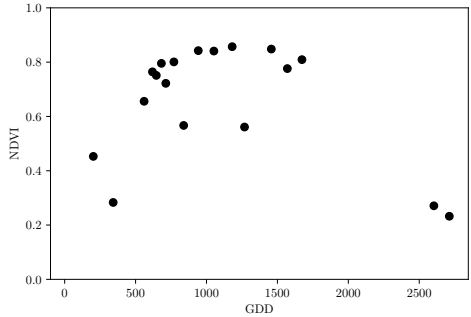


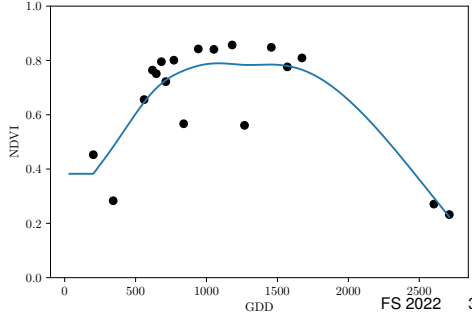
Kriging / Gaussian Process Regression



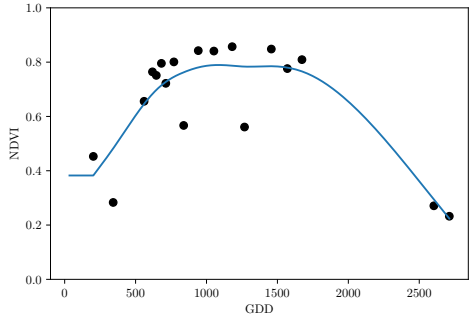


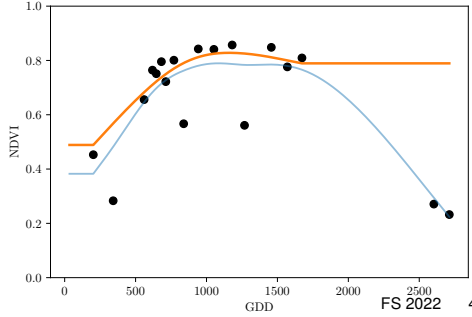
1. Interpolation





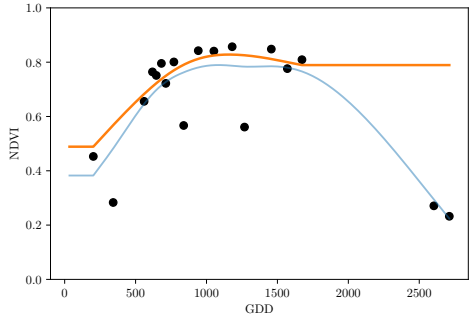
2. Robust Reweighting

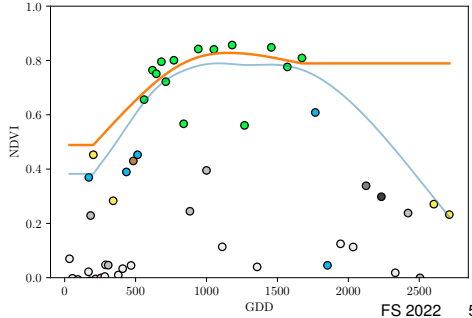




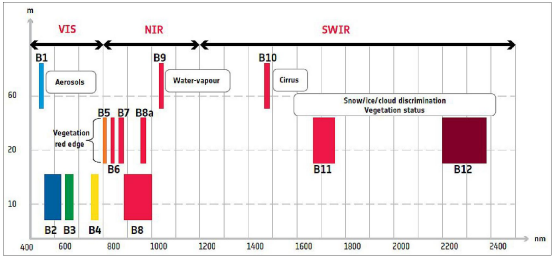
3. Other Scl-Classes

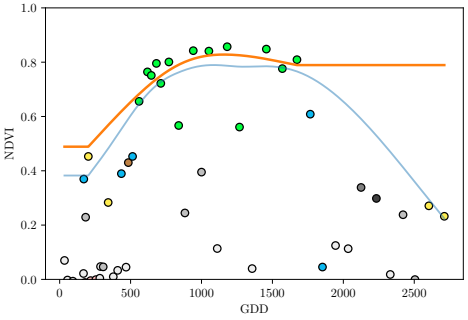
Class	
No Data (Missing data on projected tiles) (black)	
Saturated or defective pixel (red)	
Dark features / Shadows (very dark gray)	
Cloud shadows (dark brown)	
Vegetation (green)	
Bare soils / deserts (dark yellow)	
Water (dark and bright) (blue)	
Cloud low probability (dark gray)	
Cloud medium probability (gray)	
Cloud high probability (white)	
Thin cirrus (very bright blue)	
Snow or ice (very bright pink)	





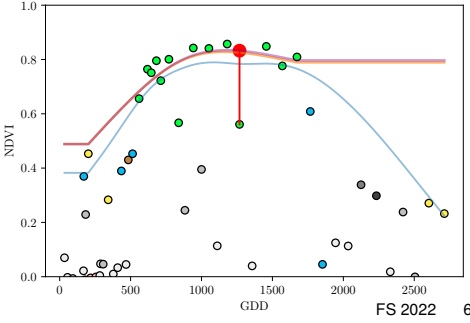
4. Correction





- get “true” NDVI
- get table:

“truth”	observed	scl-class	B2-B10	weather
“truth”	observed	scl-class	B2-B10	weather
…	…	…	…	…



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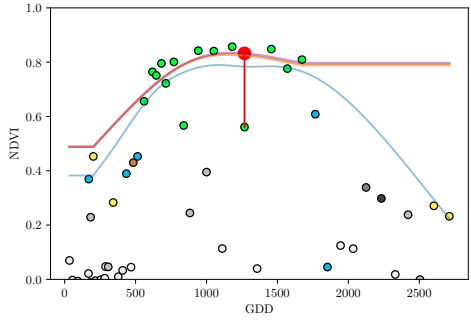
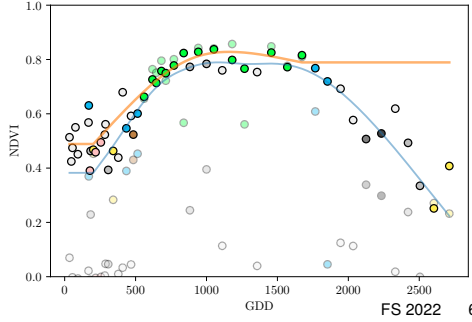
“truth”	observed	scl-class	B2-B10	weather
“truth”	observed	scl-class	B2-B10	weather
…	…	…	…	…

- Random Forest
- predict/correct NDVI



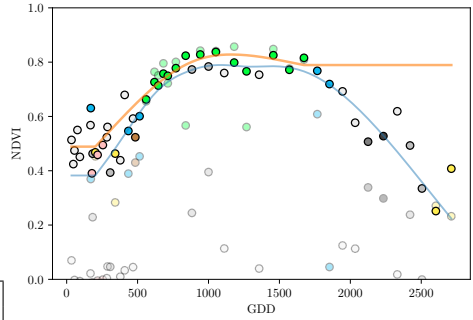


5. Uncertainty Estimation

- Table with residuals:

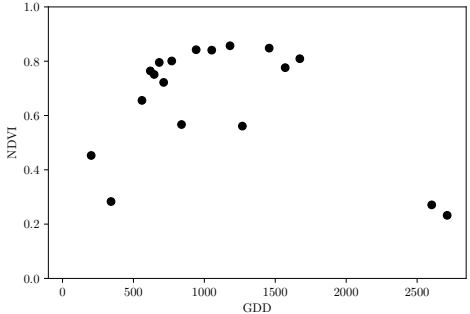
residuals	observed	scl-class	B2-B10	weather
residuals	observed	scl-class	B2-B10	weather
...	...	...	...	...

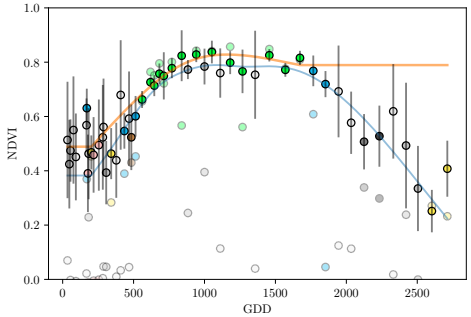
- Random Forest
- predict residuals
- $weights = \frac{1}{|residual|}$

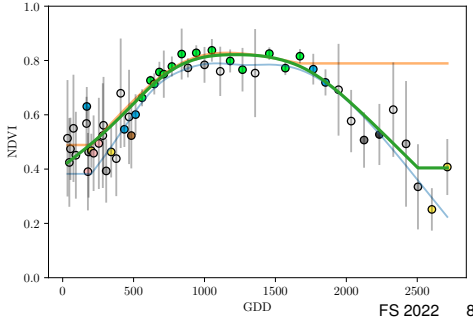


6. Robust Fit to Corrected NDVI

Reminder: Original Situation

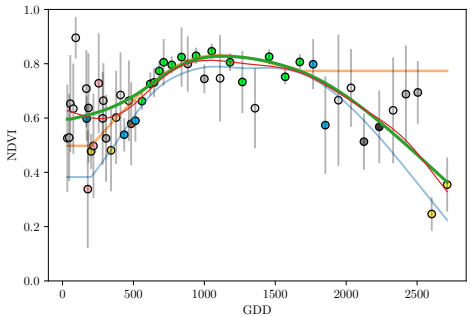






Overfitted?

Leave current year out for training



Use all years for training