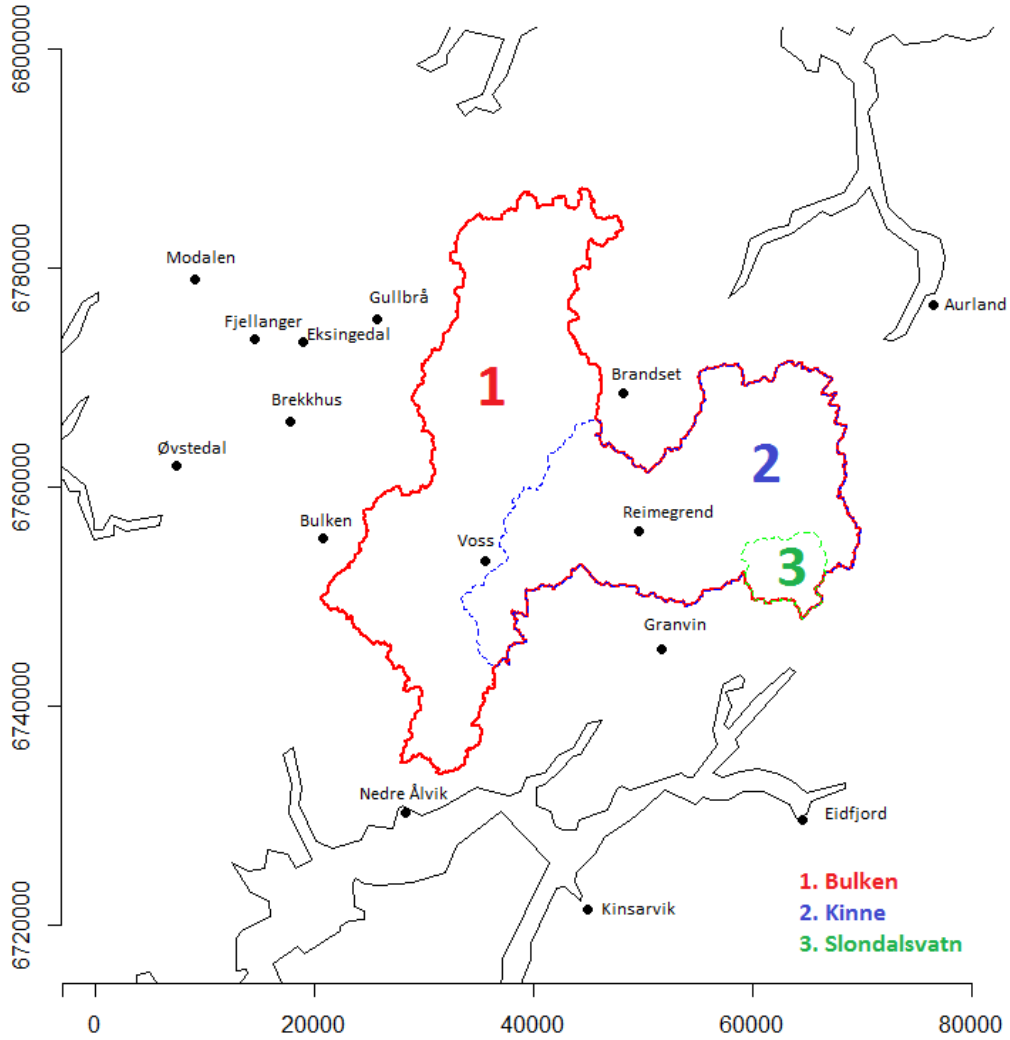
Spatial prediction of annual precipitation

Voss 2014



How to deal with limited data and data uncertainty?

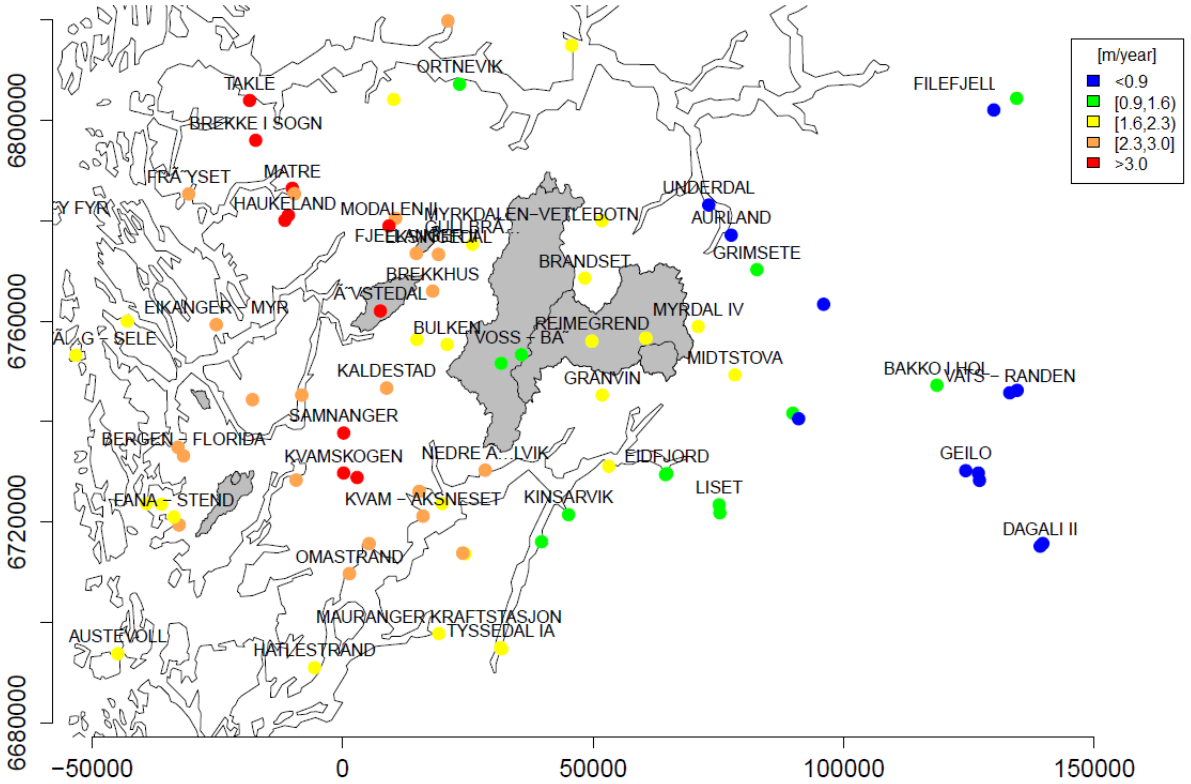
Install more precipitation gauges?

Spatial statistics :-)

Tobler's first law of Geography:

"Everything is related to everything else, but near things are more related than distant things".

Gaussian random fields.



Model for precipitation at location $\boldsymbol{s}$

Observed precipitation= Covariates + Gaussian random field + Noise

$y(\boldsymbol{s}) = \boldsymbol{x}(\boldsymbol{s})'\beta + c(\boldsymbol{s}) + \epsilon(\boldsymbol{s})$

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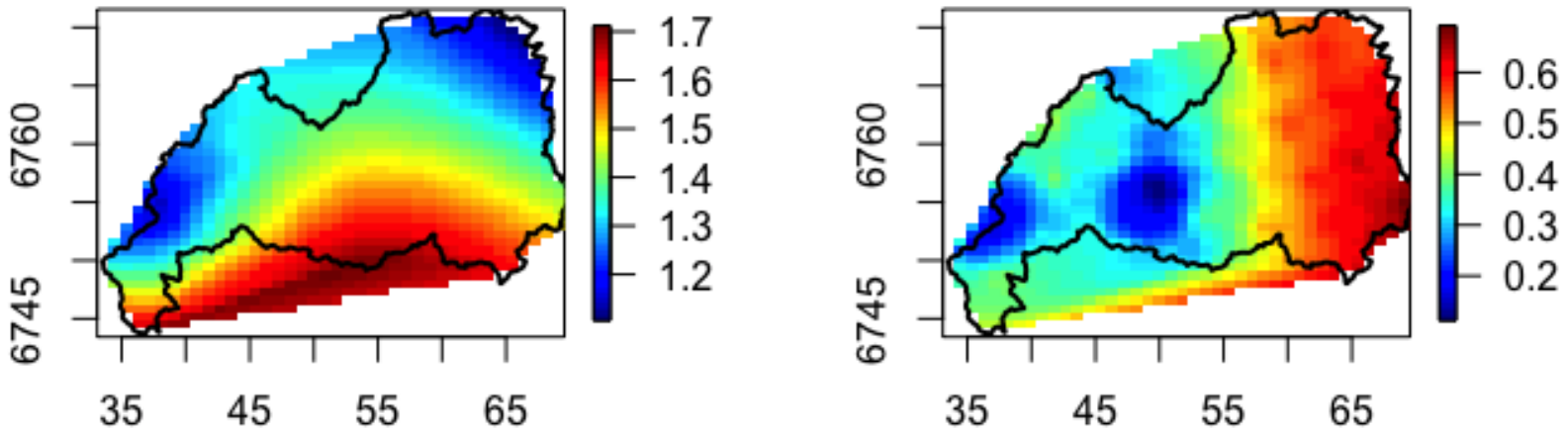
Result:



Estimated precipitation in 1993 with corresponding standard deviation [m/year].

My phd-project

So far: Point observations of precipitation are used for prediction.
Next step: Add observations of runoff.

Runoff is the flow of water caused by rainfall and/or snowmelt.