

Day 3 Uncertainty Workshop Proceedings

AM discussion- Point 1: "defining the PI"

Setting the PIs wider- conservative

95% confidence is standard statistical convention

For sensitivity analysis 95% confidence may be too wide –

90% maybe more acceptable..

The interval should bound the reality 9 times out of 10 occurrences

Point 2- Accuracy/validation

Version 1 not to report on a global measure of accuracy.

Version 1 not to require new sampling- only using legacy data

Reporting of accuracy through validation (probability sampling)- not to come till

Version 3.

Version 1: Point support predictions with at 90% PI for all soil properties

Version 2: As for Version 1 and Block predictions

Version 3: As for Version 2 and some measure of accuracy (via probability sampling) new data.

Version 4: Each property at each depth given a rating (A, AA, AAA status) dependent on meeting 'expert defined' threshold criteria. Both at point and block supports.

After coffee: Gerard discussing versioning table and six uncertainty specification levels. Can't we use expert opinion to get an answer for the third option. Expert judgment in terms of high / med / low uncertainty. To achieve a version one needs to complete each of the aims in terms of outputs and validation exercises. Are we encouraging poor mapping but allowing people to complete versions through low quality maps (Linda L.).

How it will be done: a non-prescriptive list of suggested methods for an appendix.

Use of certainty or uncertainty terminology? Confusing the issues perhaps. Confusion with everyday use of the word? Should we use accuracy instead?

Discussion on splines and uncertainty

Session on splines and uncertainty at next GSM meeting?

Going from GSM output back to original splines – is this allowed?

Next: Getting to version 1 for different levels of data.

Year stamping

It would be valuable to provide a raster surface to indicate the age of observational data used in the modeling

With each prediction location the year of the nearest data point (or weighted average year of the nearest 8 data points) should be reported. This idea will be investigated

for inclusion as a specification in version x. Specs to somehow reflect date range of the data????????????? Practical reason is to show how old or out of date the data is or can be.

2 distinct cases for uncertainty prediction that most data sets in the world will fall within

Many points/few class maps

Many class maps/fewer points

Data density of points compared to variability

Guidance for uncertainty estimation methods

“Sufficient” data points to produce maps

1. Use any geostatistics technique??? Variety of methodologies to get to uncertainty

1a-Model soil property-with covariates

1b-Model the error in the soil property-map of the soil property, independent soil point data, model residuals with geostats

2. Cross validation approach-(requires less point data??)

No point data

Expert judgment needed

3. Expert (Prior) knowledge and distribution of Soil maps

-Lowest of the low gives the low and highest of the high gives the high

-Monte Carlo example

Alternative classification

1 Spatial statistics – spatially varying prediction variance is generated from the model

Spatial statistical modeling of the soil properties (not residuals)

2 Formation of residuals from independent data set or resampling techniques

(a) Build spatial statistical model (can include covariates)

(b) Build non-spatial models probably on the covariates

3 Expert knowledge with soil class maps.

(a) Weighted average from map units

(b) Weighted average from

Eg pH : example of ratings for thresholds of accuracy. Use of independent data is a requirement.

	Avg width of 90% prediction interval	% area falls within the 90% prediction interval
A	3	90
AA	2	90
AAA	1	90

Version 1 product by Orleans

P – point based uncertainty estimates

E – expert approaches

Denmark	P	Mogens Greve
Nigeria	P	Odeh / Hannes Reuter
France	P & E	Dominique
Africa	P	Tomi Hengl
US – Lower 48	E	Jim Thompson
Canada	E	Glenn Lelyk
NZ	E & p	Alan Hewitt
Australia	P & E	Ross Searle
Republic of Korea	P & E	Young Suk Hong
Netherlands ?	P & V	Dick Brus \ Dennis Walvoort
Europe ???	P & E	Cristiano Ballabio
Argentina ???		Marco ?
China ???		Ganling Zhang
Taiwan ???	P	Sun
Czech Republic		Lubos Boruvka