

For the purposes of these specifications, uncertainty is defined for each location and depth increment at increasing levels of sophistication in Table 1. For version 1, it is the 90% Prediction Interval (PI) which reports the range of values within which the true value is expected to occur 9 times out of 10 (or 90% of the time). There is no assumption that this prediction interval is necessarily symmetric around the predicted value.

The products will provide enough/adequate/sufficient (but some may feel a 90% PI is inadequate) information about uncertainty for users to make a valid interpretation of the usefulness of the products for their needs.

Communication of uncertainty. Not our responsibility. Can of worms. It's important. Alex – fix this!

Certainty-consensus to use uncertainty

Paragraph on validation. Idea: From version 3 and beyond, we will provide regional / national independent summary / accuracy measures of accuracy of the maps and their uncertainties. Do we require model-free measures of accuracy? Independent quality assessment

of the product by comparison of the predictions with independent observations. List some options here (and Table 1). Ideally – use a probability sample. Validation of predictions in one stage, and validation of claims of uncertainty in a second stage (perhaps done together). Validation sampling appendix (Bas and Brendan to write a couple of paragraphs on this).

Year Stamping:

With each prediction location the year of the nearest data point or modal profile or year of publication of soil polygon (or weighted average year of the nearest y data points could be reported). This idea will be investigated by AU and US for inclusion as a specification in version X (x=2?).

Version/level	Spatial entity	Grid	Properties	Uncertainty	Validation measure
1	'point'	3 arc second by 3 arc second by standard depths (Table 1)	Point estimates of all properties in Tables 4, 5 & 6 at all depths	Upper and lower 90% PI for all properties at all depths	N/A
2 (includes all version 1 product)	100 m by 100m block by depth increment	3 arc second by 3 arc second by standard depths (Table 1)	Block average of all properties in Tables 4, 5 & 6 at all depths	Upper and lower 90% PI of block average for all properties at all depths	N/A
3 (includes all version 2 product)				Marginal probability distribution for each and every xyz-point	National/Regional RMSE, etc. for point predictions for all properties at all depths, by independent (probability) sampling
4 (A, AA, AAA)				Complete spatial-multivariate probability distribution (joint probability distribution for all soil properties and xyz-points)	Thresholds are met for each prediction

Uncertainty