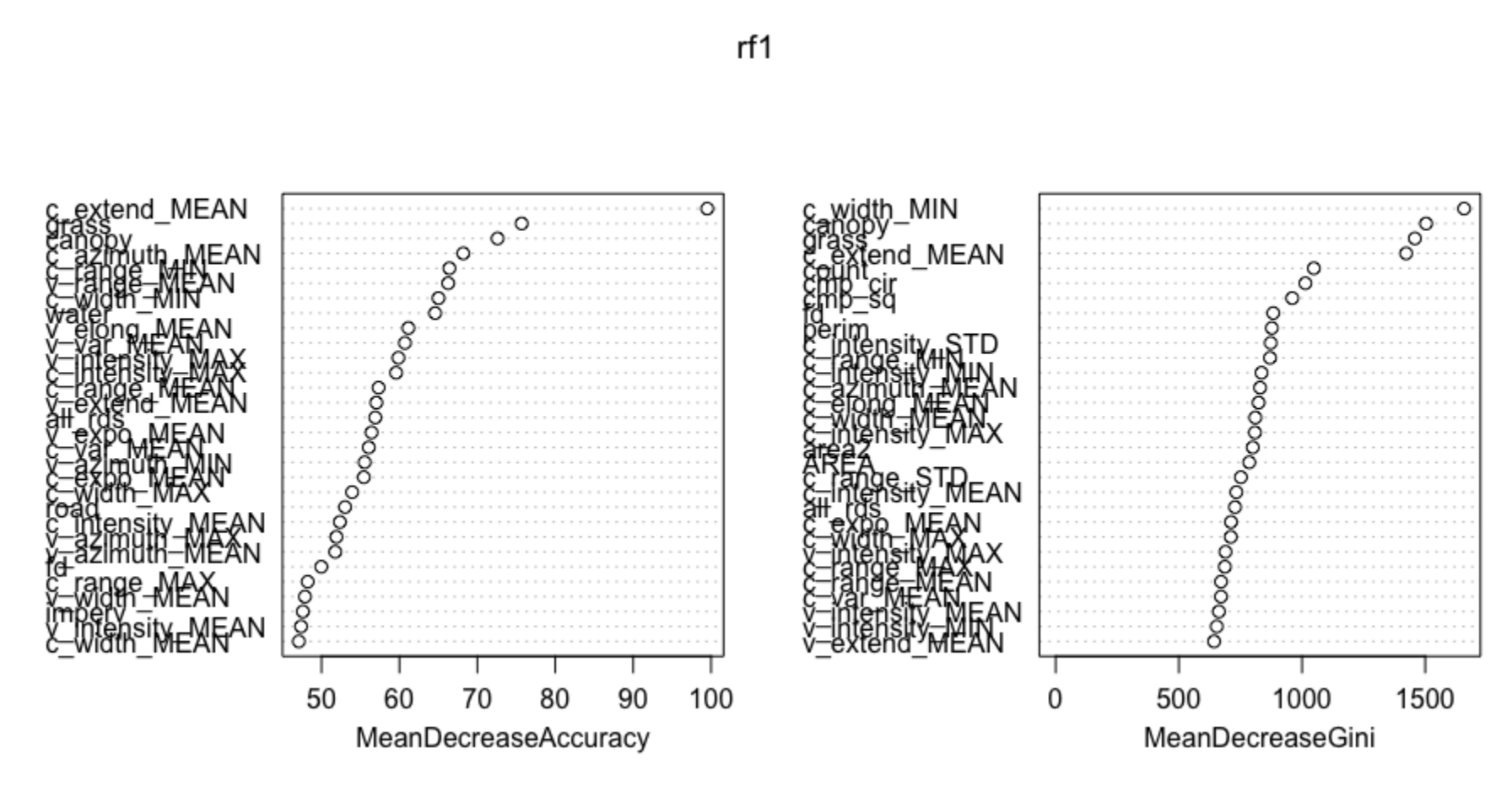
Hydrography updates

David Saavedra, LUWG update Jan 6, 2021

- Initial random forest model run on classified hydrography features
- Initial variables used:
  - *r.geomorphon* outputs describing morphology of each feature (orientation, depth, relative elevation, elongation, etc.)
  - Shape index – distinguishes long narrow features (i.e. stream channel) from compact round ones
  - Land cover summary within each feature
  - Geometry of each feature –perimeter, area

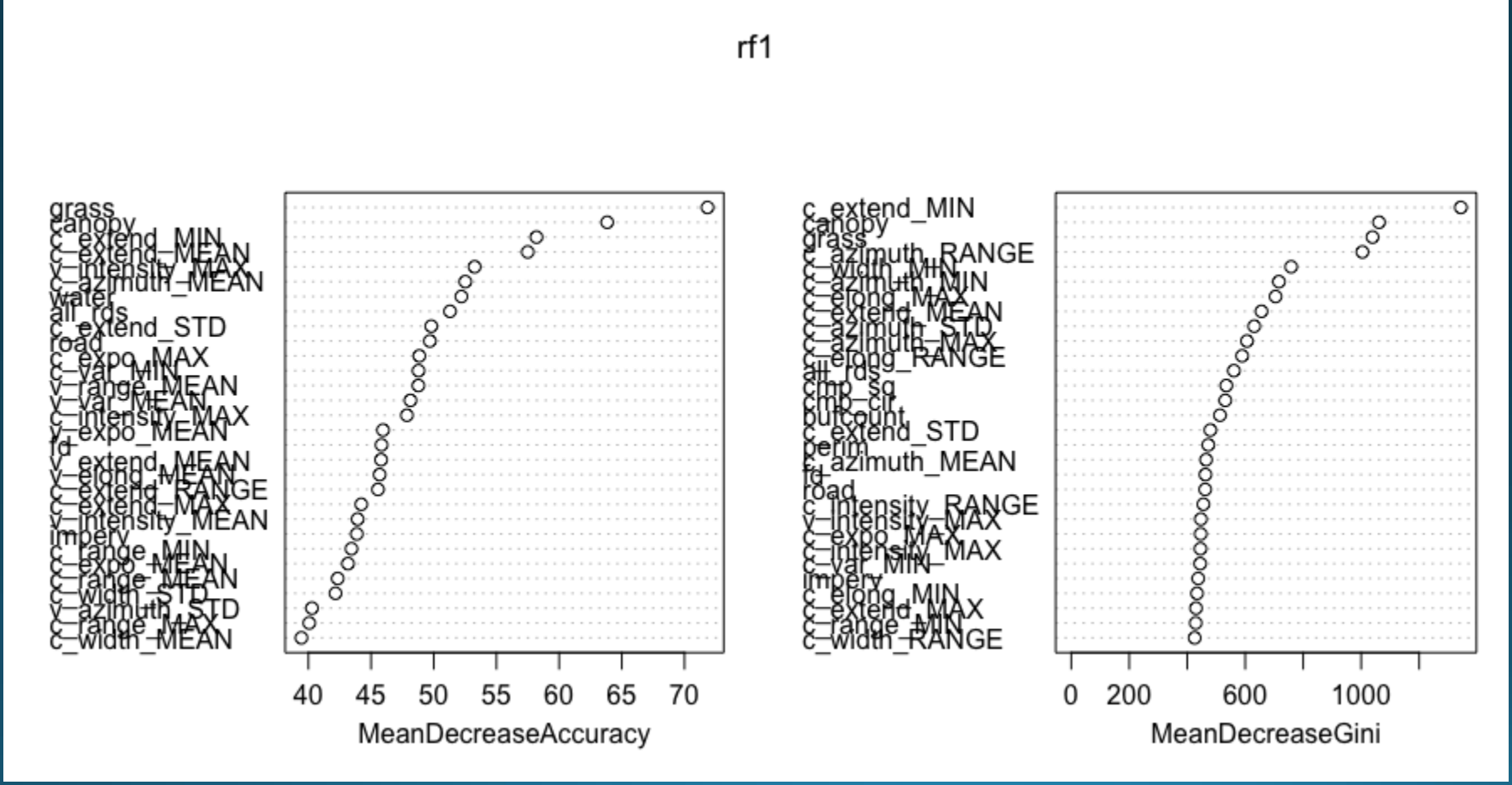
Initial random forest results

- Variable importance plot using mean values within features:



Initial random forest results

- Variable importance plot using additional statistics:



Initial accuracy

- ~62% accuracy at distinguishing different classes (stream, ditch, gully, floodplain depression, etc.)
- ~81% accuracy when simply distinguishing stream/non-stream
- Confusion matrix:

	A	B	C	D	E	F	G	H	I	J	K
1		other	gully	road ditch	ag ditch	detention	floodplain	unknown	wetland	stream	error
2	other	3559	355	152	950	104	144	0	0	1435	0.46872668
3	gully	616	1077	42	1507	33	139	0	0	2950	0.83076681
4	road ditch	642	10	545	73	12	5	0	0	477	0.69104308
5	ag ditch	476	458	57	3478	37	135	0	0	1551	0.43830749
6	detention	373	54	18	171	556	42	0	0	966	0.74495413
7	floodplain	180	97	4	430	18	1251	0	0	1627	0.65317438
8	unknown	0	0	0	0	0	0	0	0	8	1
9	wetland	22	31	3	80	5	24	0	14	210	0.96401028
10	stream	659	330	101	906	88	366	0	0	19800	0.11011236

Next steps

- Consultation with Dr. Baker at UMBC and Kumar Mainali, Conservancy's in-house AI expert to explore ways to improve results

- PA North Central 2018 lidar is finished and en-route from USGS
  - In combination with PA South Central collection, will provide full QL2 coverage of CBW portion of PA
  - Will allow us to begin producing initial hydrography products for remainder of HUC8s within or intersecting PA
- New lidar collection for northern/middle neck of VA to be complete soon (before April/May)