

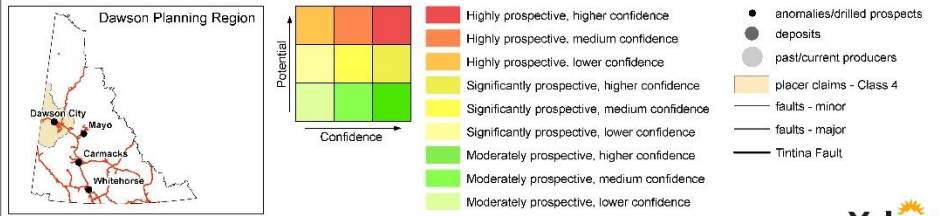
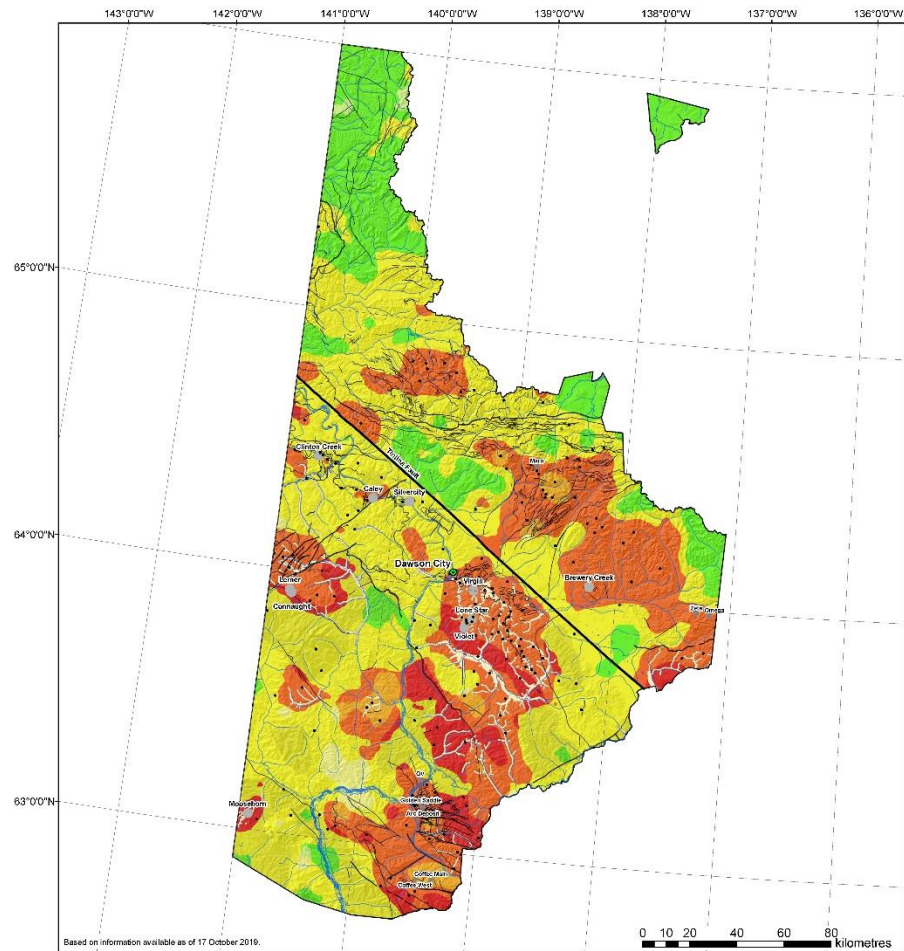


Mineral Potential of the Dawson Region

Warwick Bullen, Scott Casselman
Yukon Geological Survey, EMR



Mineral Potential/*Confidence in Geology Mapping for the Dawson Region Land Use Planning Area



*Reflective of how much bedrock mapping has been done in an area.

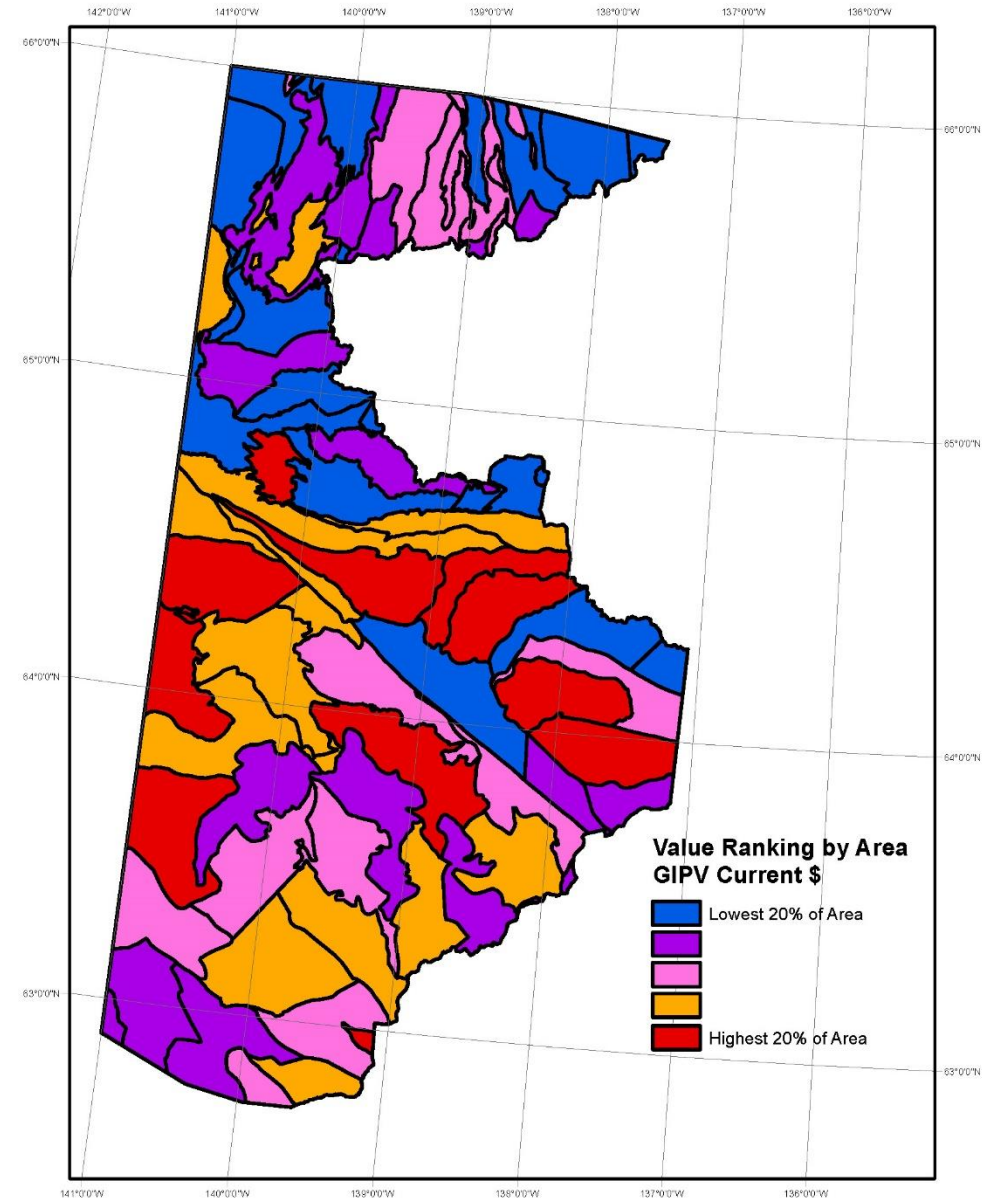


Previous method:

- Mineral potential maps produced using the “three-part method for quantitative mineral resource assessment”; which was
- Based on mineral deposit models.

Problems with this approach:

- Input process highly subjective, therefore insufficiently robust;
- Predictive power of deposit models limited (deposit scale focus, can miss or generate “false positives”, cannot distinguish large and/or high quality deposits from small and/or low quality ones; and
- Size-biased sampling issues (recently recognized; Ellefsen, 2019).

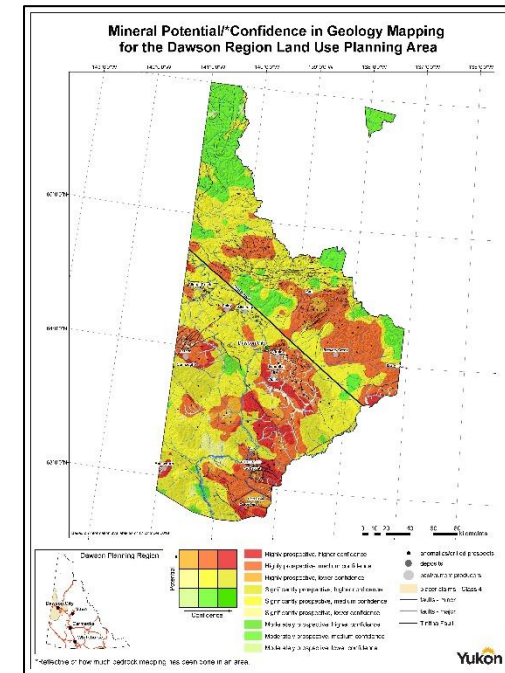
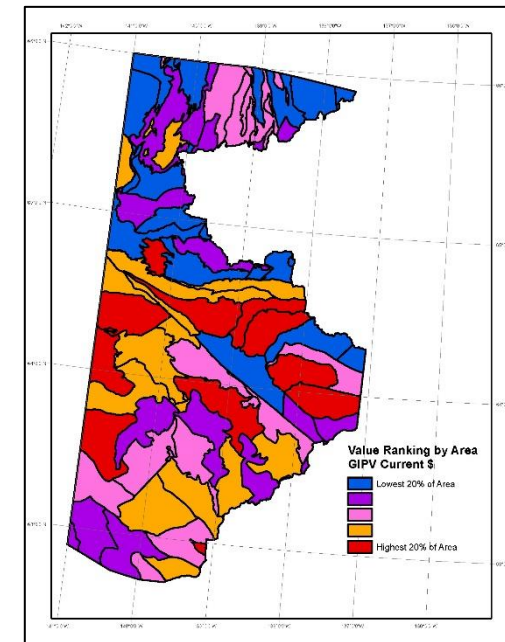


New approach:

- A generalized mineral system approach using mineral system components (actual data) that may contribute to metal accumulations generally; plus
- Additional criteria relevant to the prospectivity of the area concerned.

Requirements of the mineral potential map:

- Easy to understand, easy to relate to;
- Use actual data;
- Minimize subjective interpretations;
- Include measures of mineral potential and confidence; and
- Provide as a single map.



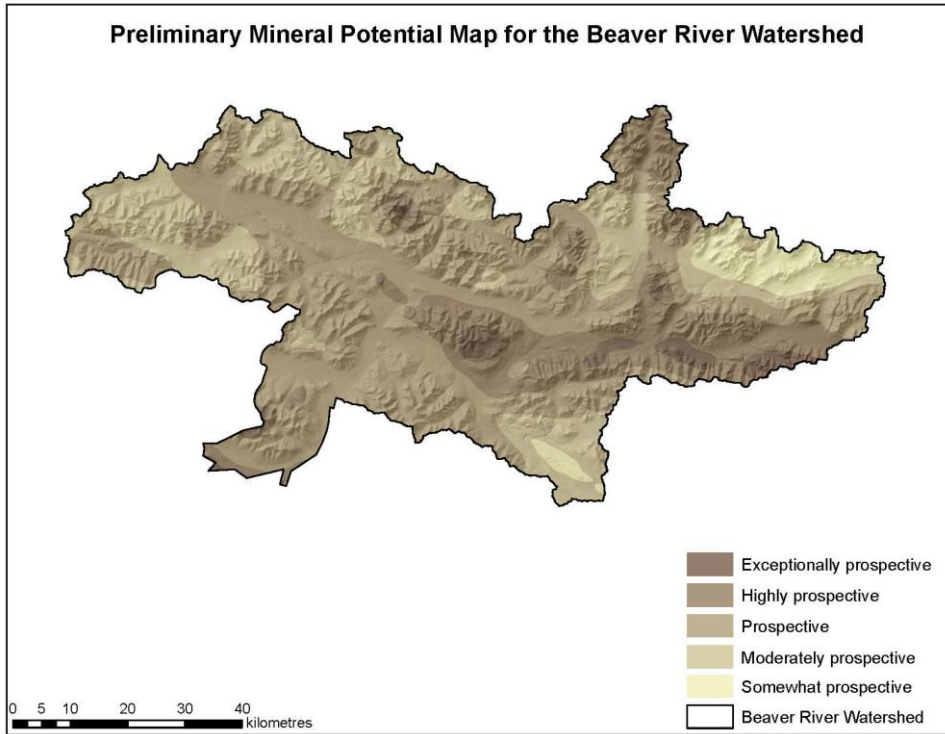
New method:

- Maps based on quantifiable, spatially-referenced features buffered and/or weight-factored as required;
- Process is iterative in nature, relies on existing rather than hypothetical data;
- Procedure makes use of block modeling techniques, each block (unit cell) is assigned a prospectivity score and, separately, a confidence score;
- Scores calculated based on the presence or absence of features within unit cells, the sum of which reflect the mineral potential of each unit cell relative to other unit cells;
- Input layers weighted according to buffer distance and/or through the application of knowledge-based factors;
- Lithology classes an exception, factored using a multiclass weights-of-evidence approach with known mineral deposits used as training points.

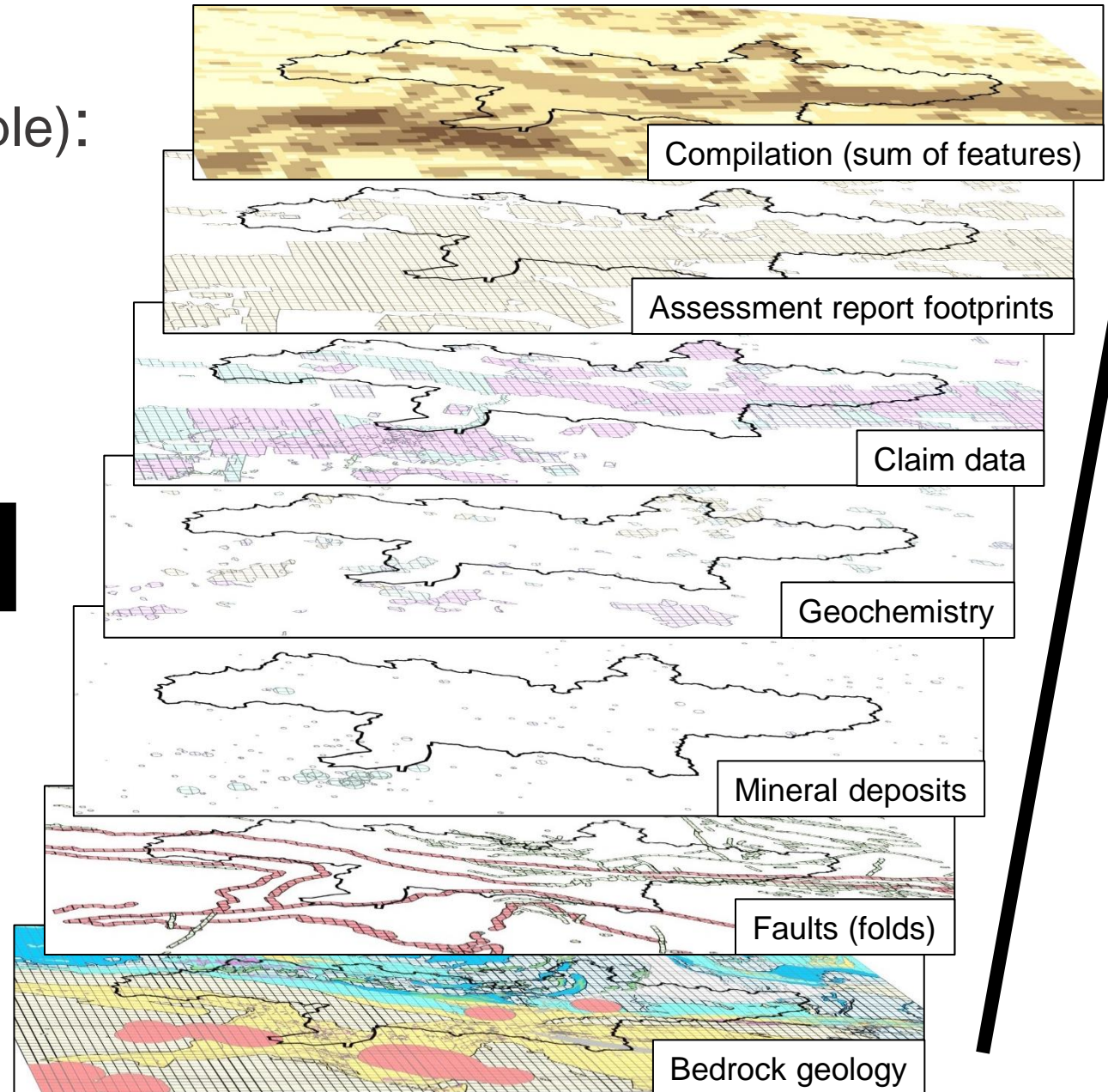


Process (Beaver River example):

➤ Interpolated prospectivity

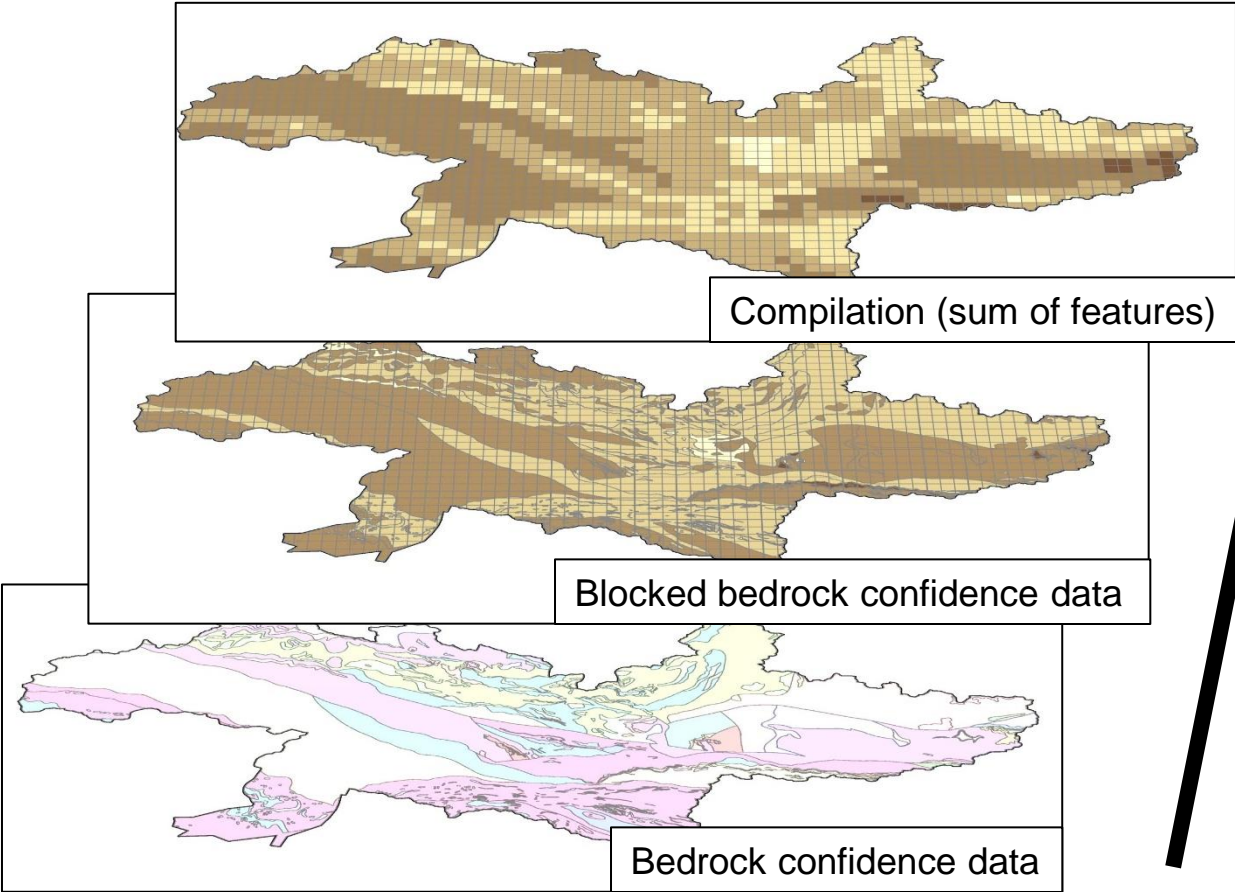
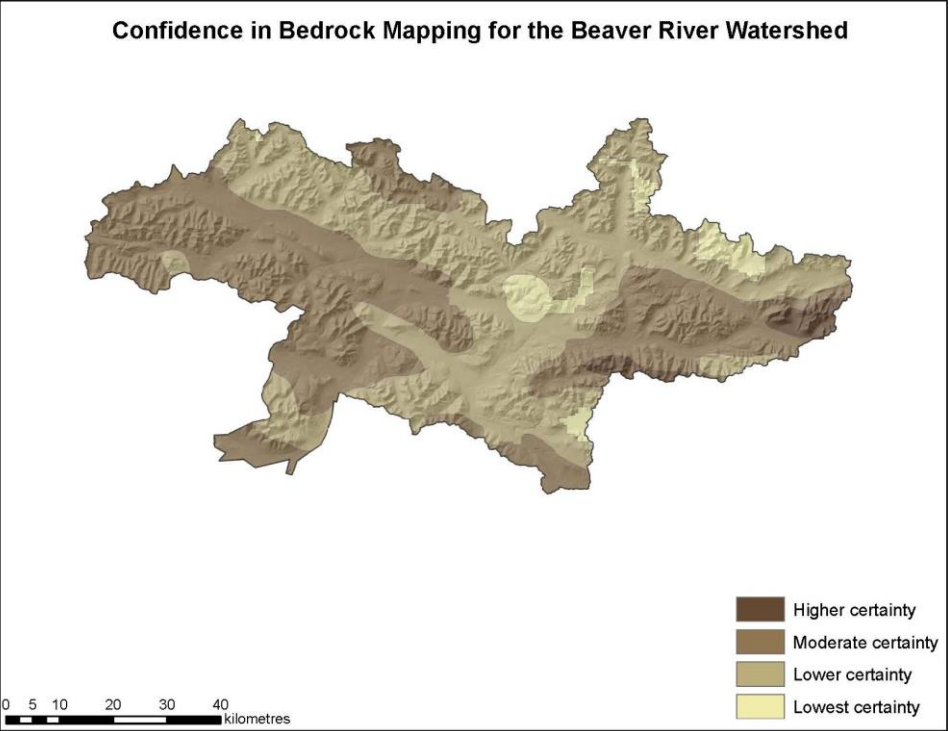


>30 layers used for Beaver River
>110 layers used for Dawson Region



Process (cont):

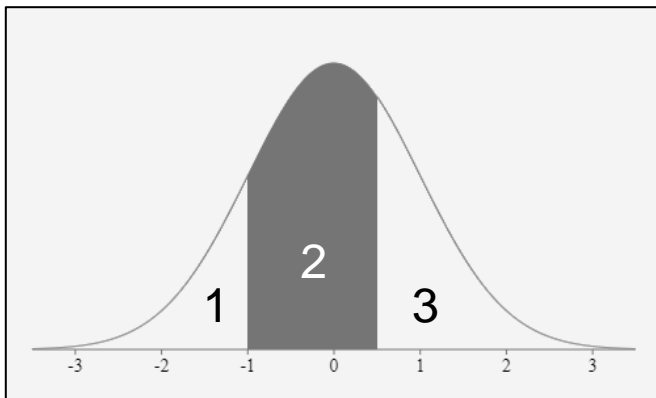
➤ Interpolated confidence.



Process (cont)

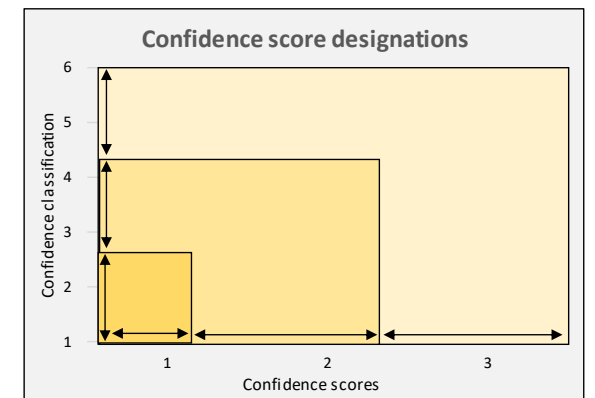
- Features used to assess prospectivity include: bedrock geology, faults, folds, stream sediment geochemistry, mineral deposit data, assessment report footprints, quartz and placer claim and status data, and placer potential info;
- Claim and assessment report footprint data are an important store of intellectual capital, therefore an important component of the mineral potential mapping process.
- Prospectivity/confidence categorization:

Three prospectivity categories



Fishnet	Freq	SumProp	LnSumProp	NormSumProp	Score
1960	5	3.3321	1.2036	0.8712	3
2265	5	1.3166	0.2751	-0.6711	2
7197	4	1.2945	0.2581	-0.6993	2
3444	5	1.1797	0.1653	-0.8534	1
6103	4	1.9548	0.6703	-0.0146	2
8385	5	1.2477	0.2213	-0.7604	1
4407	8	2.9460	1.0805	0.6666	3
6025	4	1.5048	0.4086	-0.4492	2
2056	8	5.6612	1.7336	1.7515	3

Three confidence categories

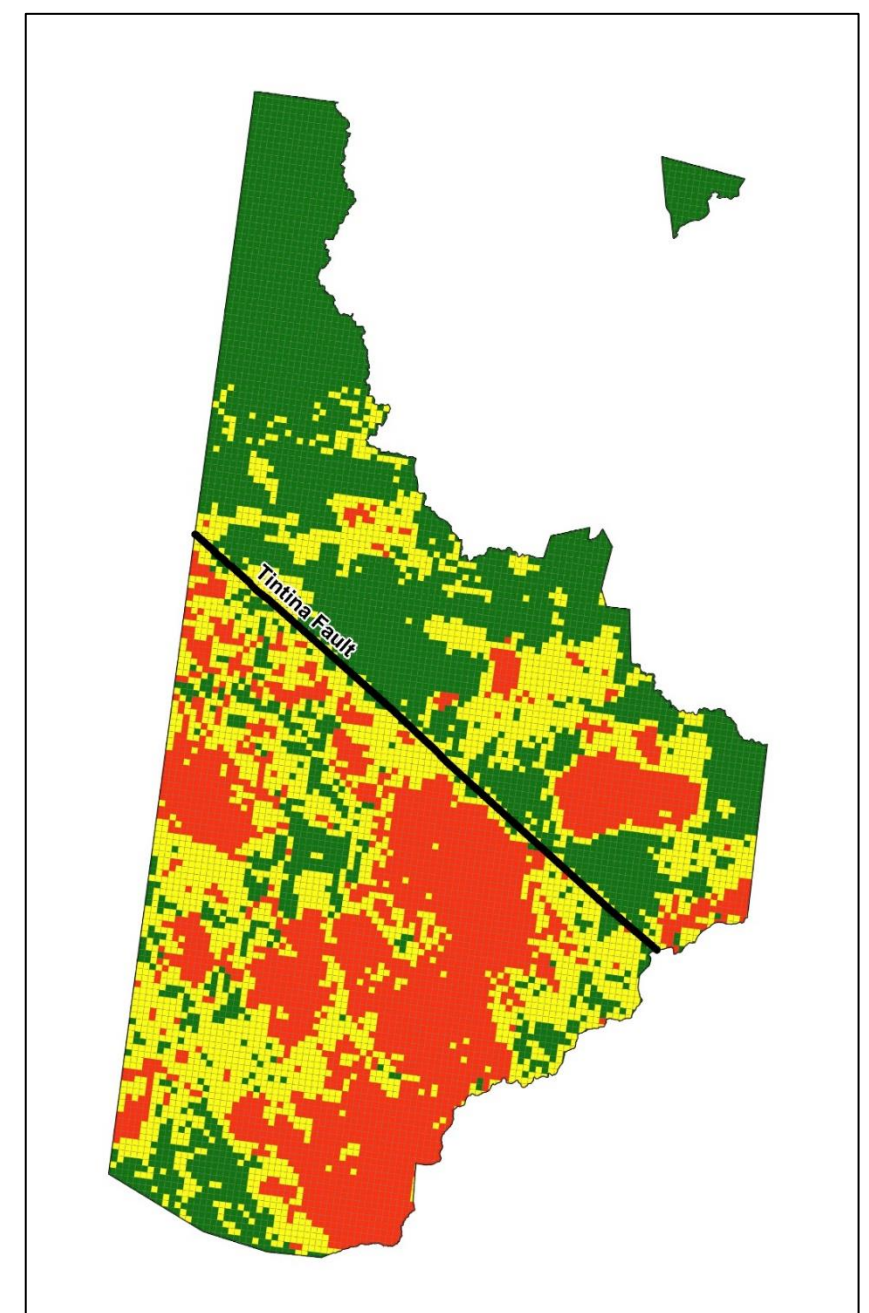


Number of possible prospectivity/confidence relationships = 9 (i.e. 3:3, 3:2.....1:2, 1:1)



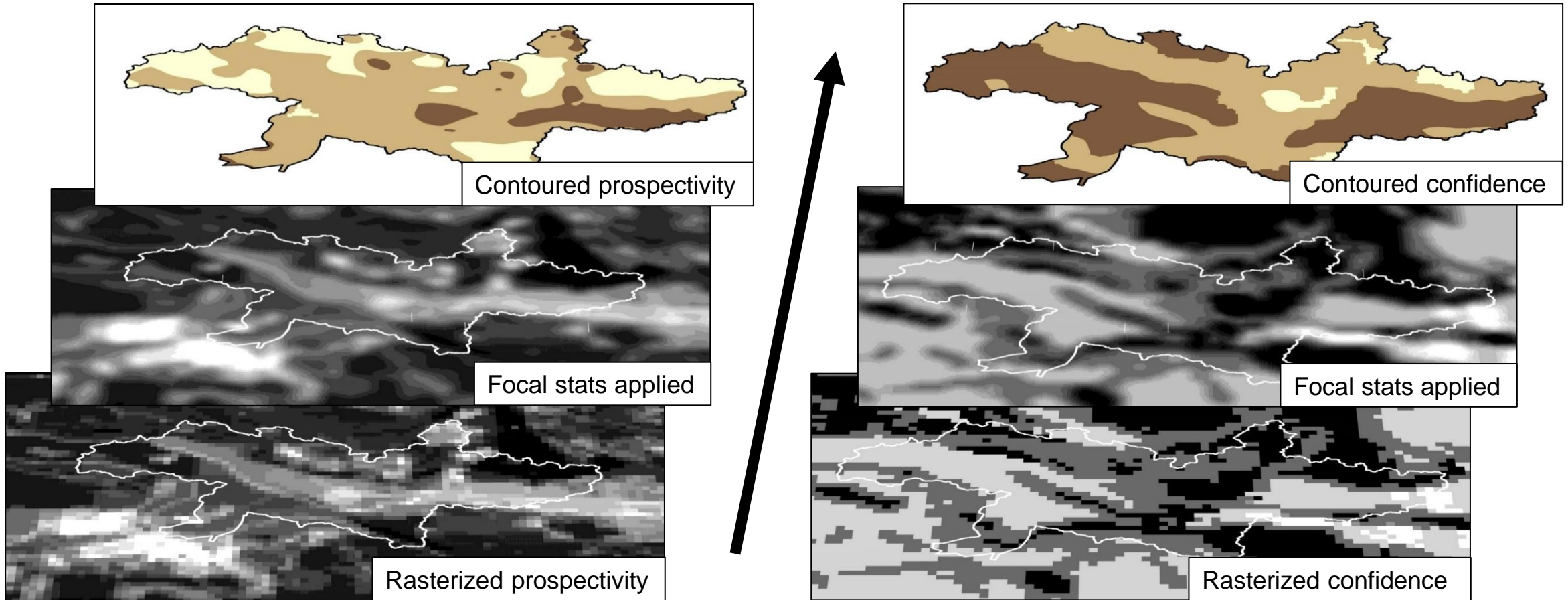
Process (cont)

- Area south of Tintina Fault approx. twice as prospective as area to the north (average block prospectivity);
- Mineral potential N/S of the fault must be levelled to remove bias – score categories adjusted accordingly;
- Achieved by proportionally adjusting areas under the normal curve.



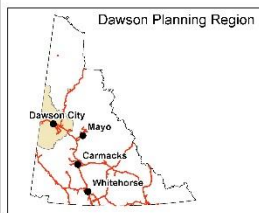
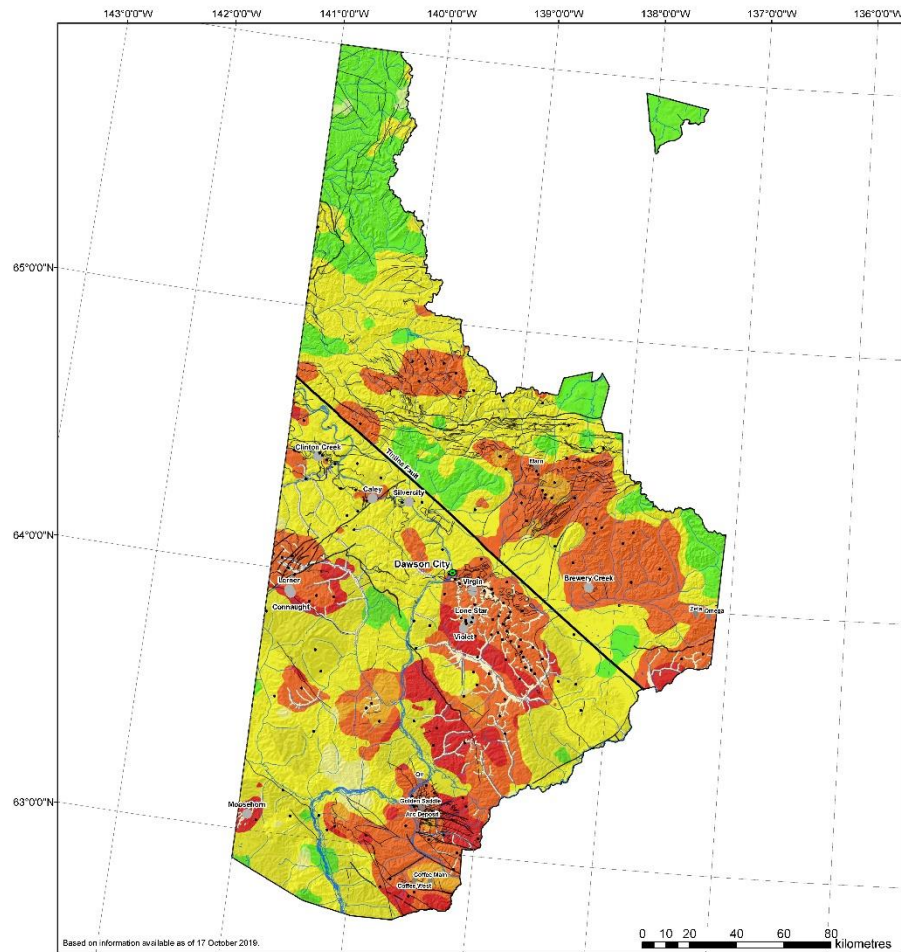
Process (cont):

- Final contouring process – mineral potential/confidence.



Fair copy:

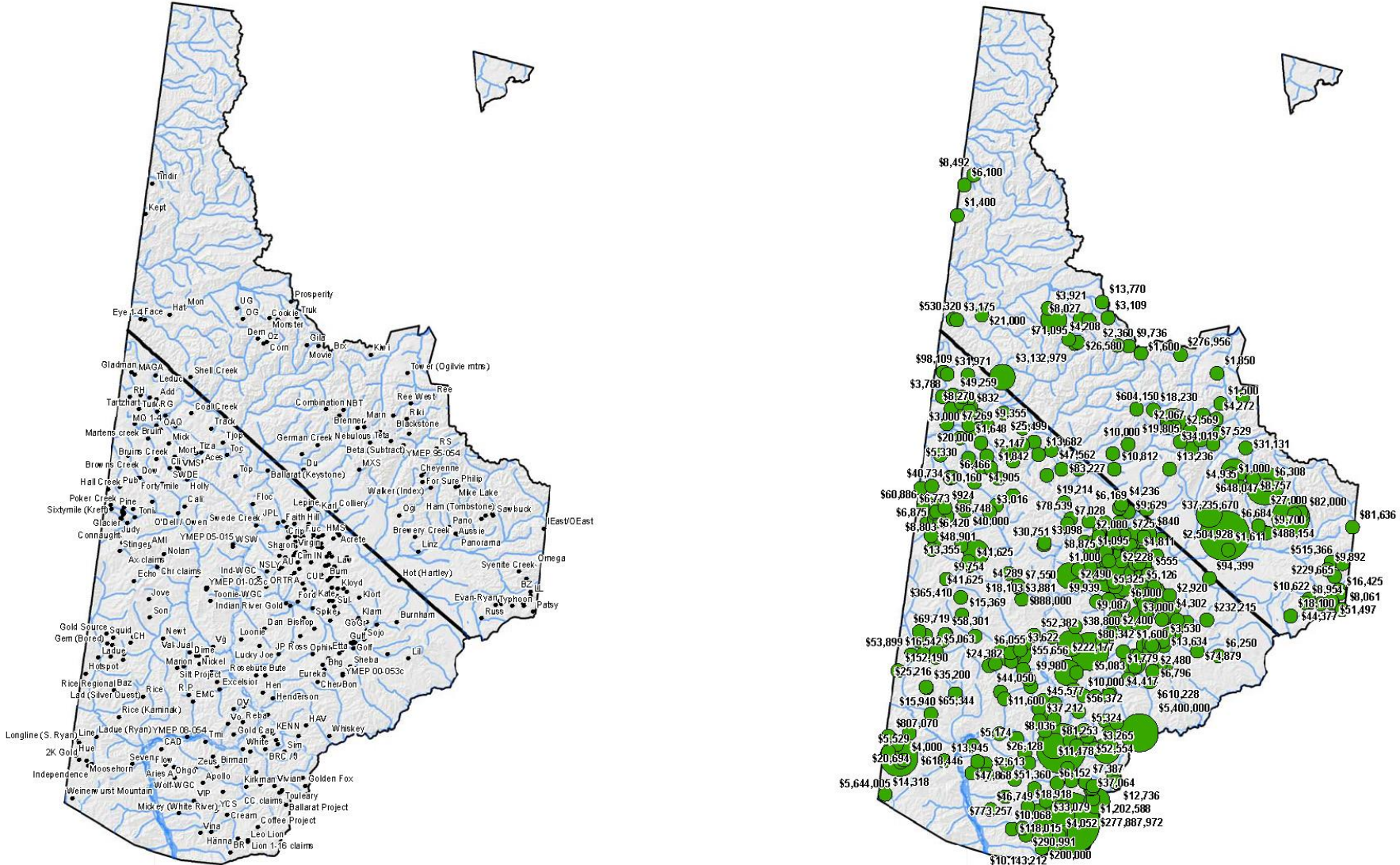
Mineral Potential/*Confidence in Geology Mapping for the Dawson Region Land Use Planning Area



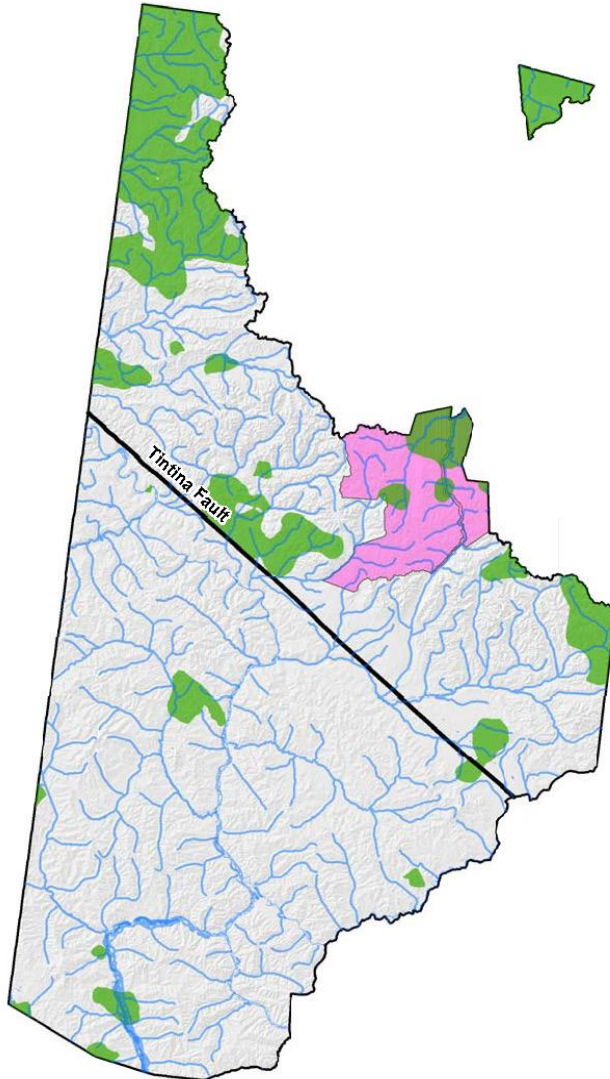
*Reflective of how much bedrock mapping has been done in an area.



Exploration projects, spends in the Dawson Region:



Areas with lower mineral potential:



Salient points:

1. Lower mineral potential areas = 15% of Dawson region.
2. Tombstone Territorial Park = 5% of Dawson region.
3. Tombstone Park includes areas with high mineral potential.



Thank you...

