RESOLVING FINE-SCALE

patterning and restoration outcomes in the coastal Everglades

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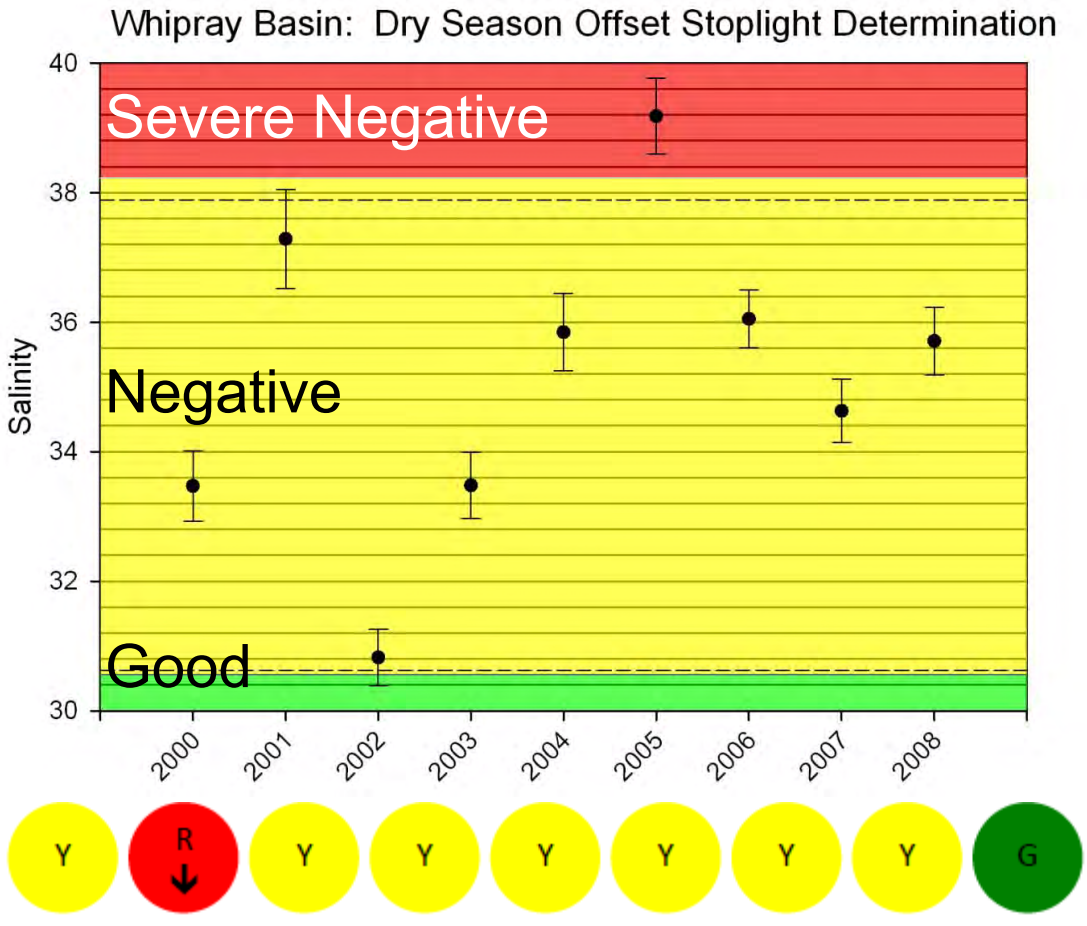
COMMUNICATING RESTORATION OUTCOMES

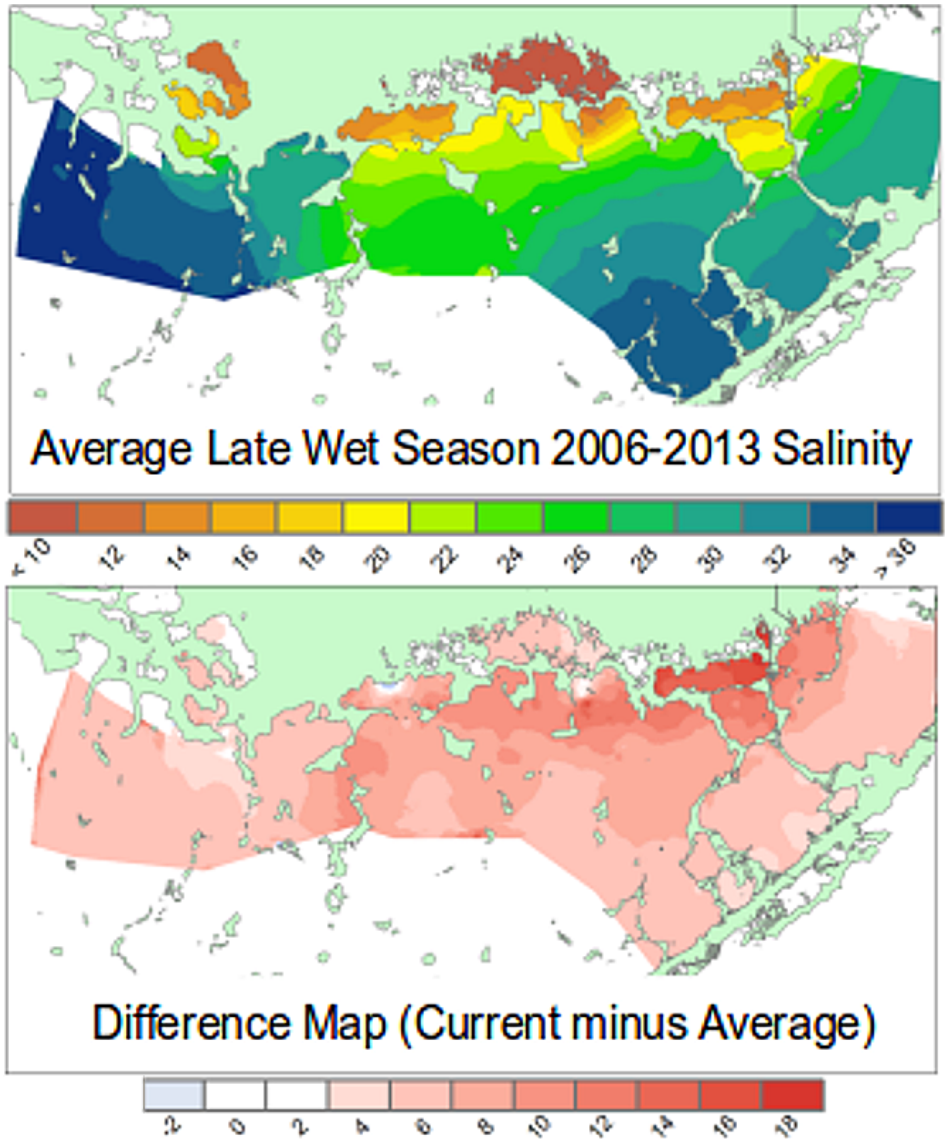
- Easy to understand
- Shows status and trends
- Difficult system-wide perspective



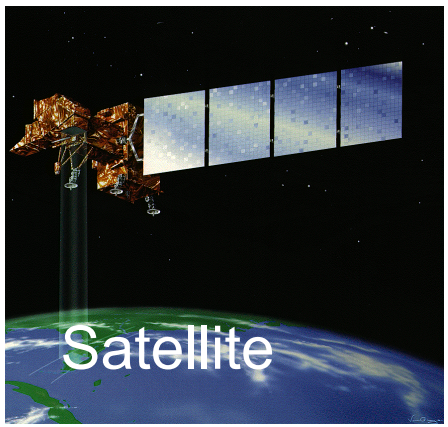
SPATIAL REPRESENTATION

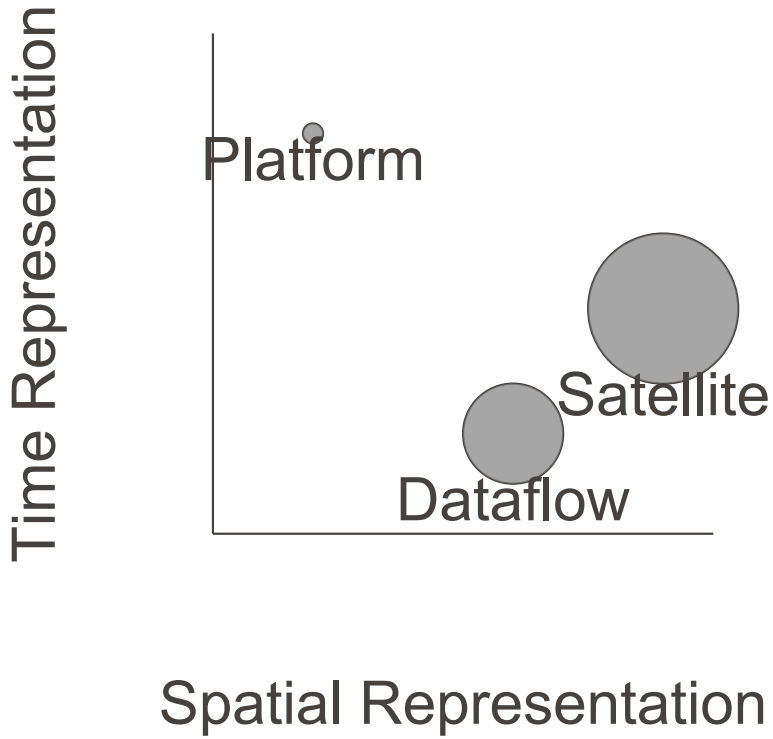
- Broader spatial representation
- More concise

1. Accuracy
2. Barriers



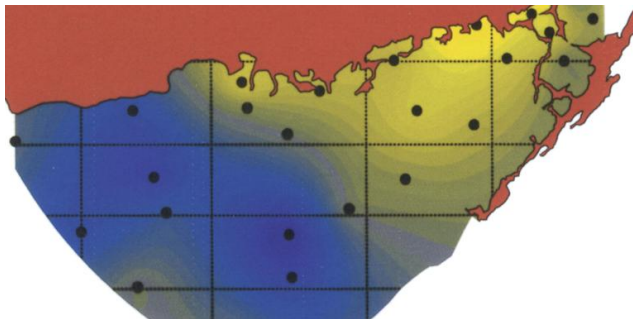
MONITORING TRADEOFFS





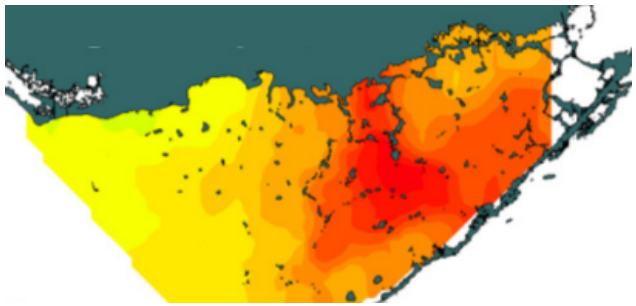
MAXIMIZE INTERPOLATION REALISM

- Fixed/Platform



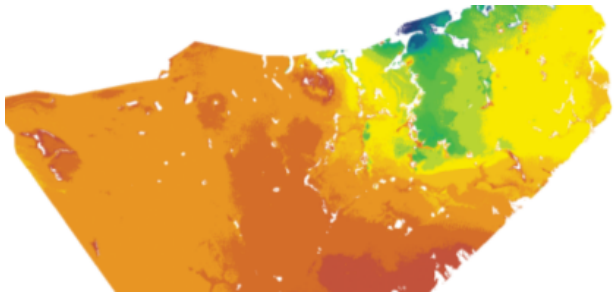
Swart and Price 2002

- Dataflow



Kelble et al. 2007

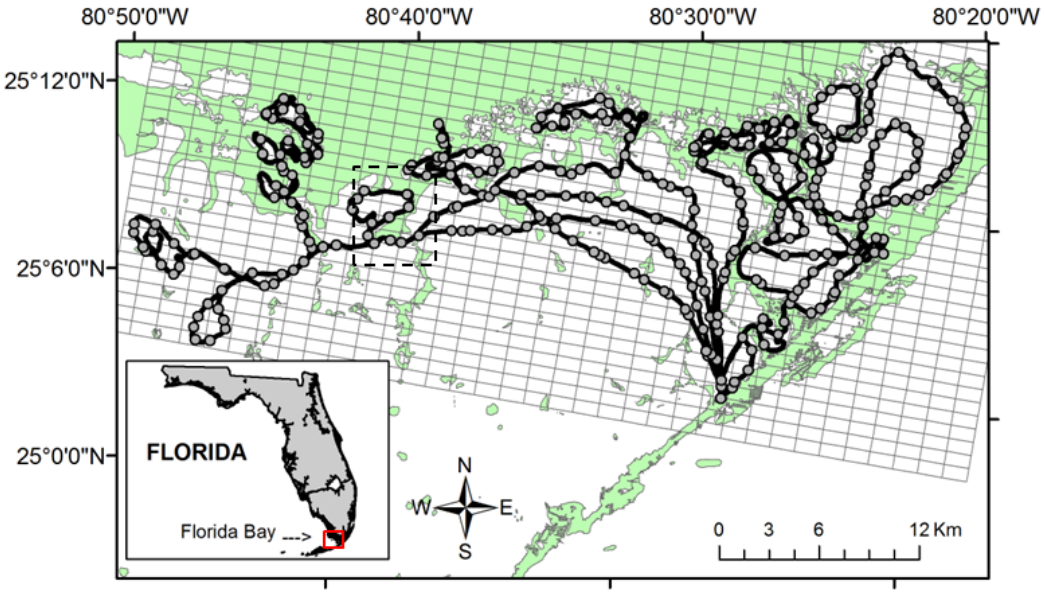
- Satellite Derived



Xie et al. 2013

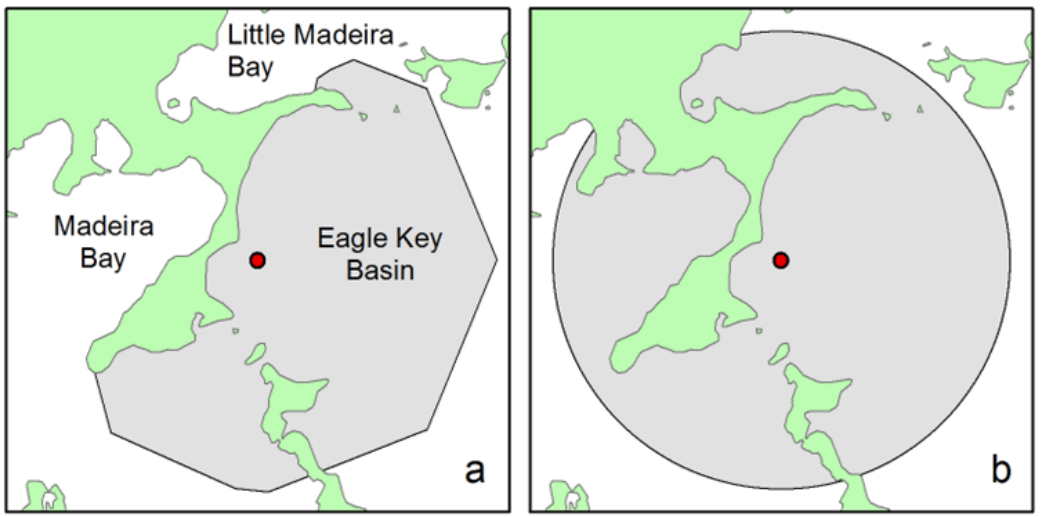
UNDERWAY DATA COLLECTION

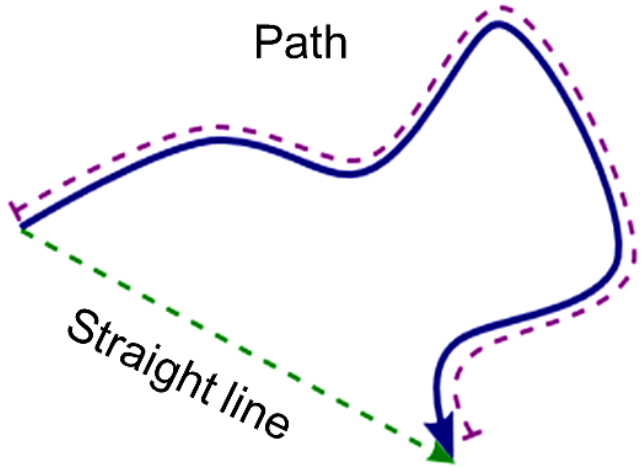
- Quarterly surveys
- Measurements every 50m
- Emphasis on freshwater discharge



INVERSE PATH DISTANCE WEIGHTING (IPDW)

As the crow flies or as the fish swims?[1][2]



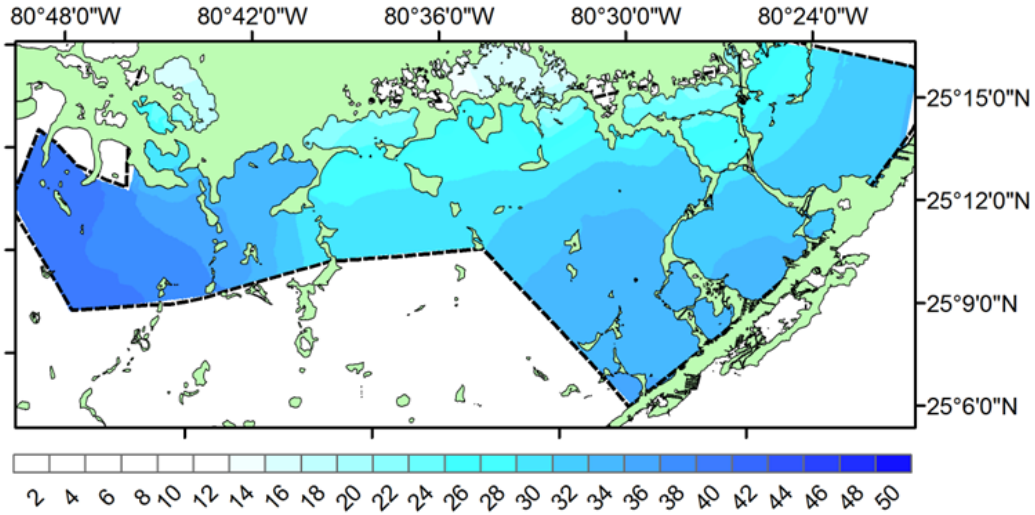


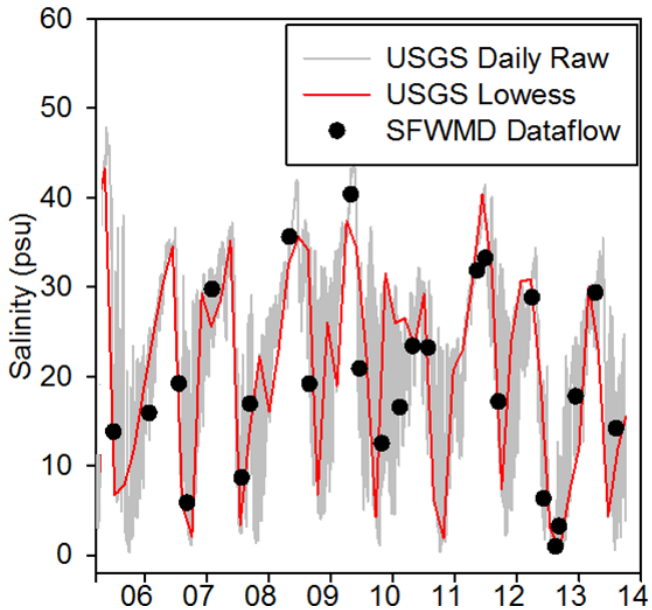
$$V = \frac{\sum_{i=1}^{n} v_i \frac{1}{d_i^p}}{\sum_{i=1}^{n} \frac{1}{d_i^p}}$$

[1] Little et al. 1997
[2] Suominen et al. 2010

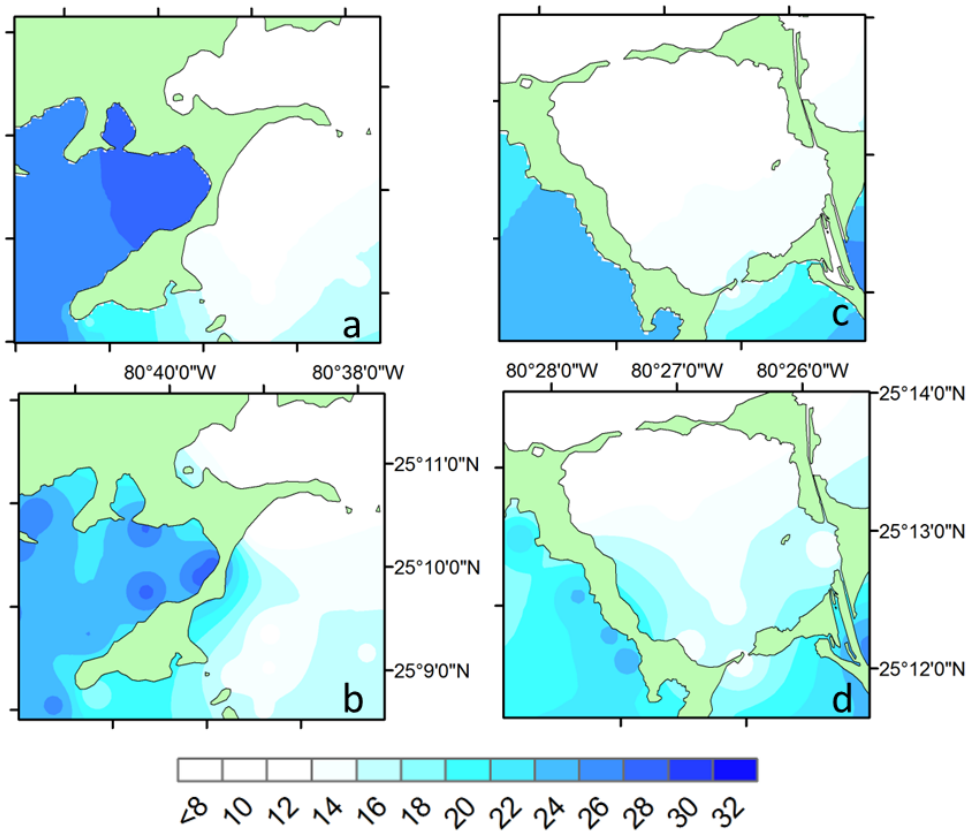
RESULTS

- Average results match expectation
- Specific results match platforms with high accuracy

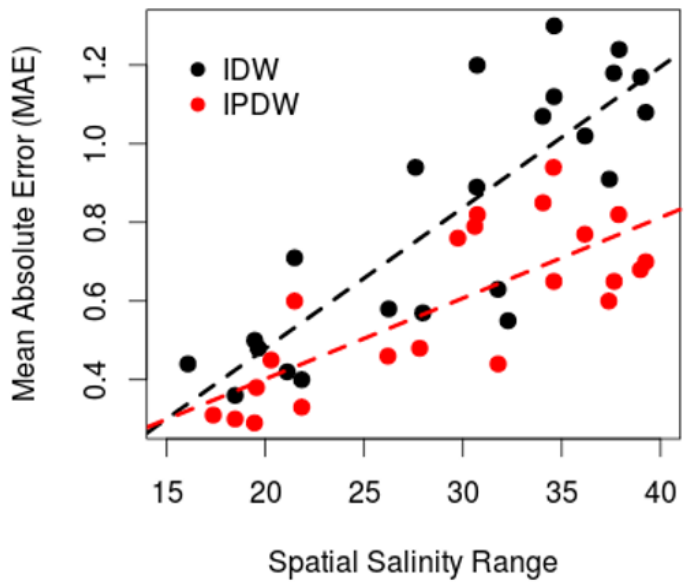




ACCURACY IMPROVEMENTS



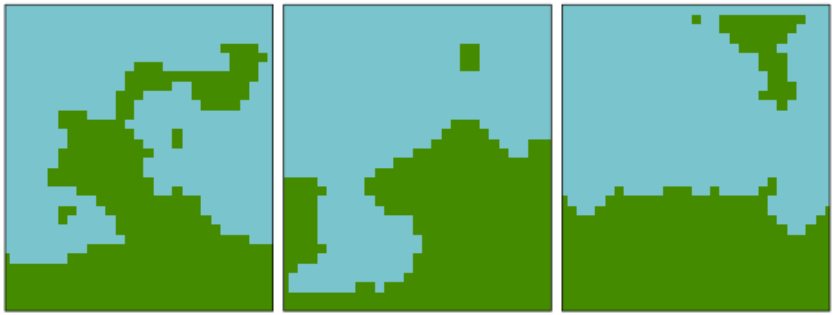
Barriers imposed realistically

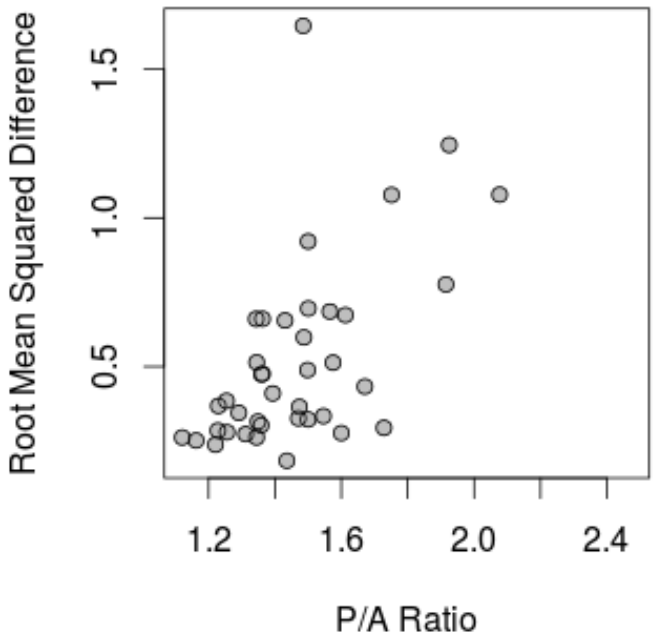


IPDW makes more difference for intense spatial gradients

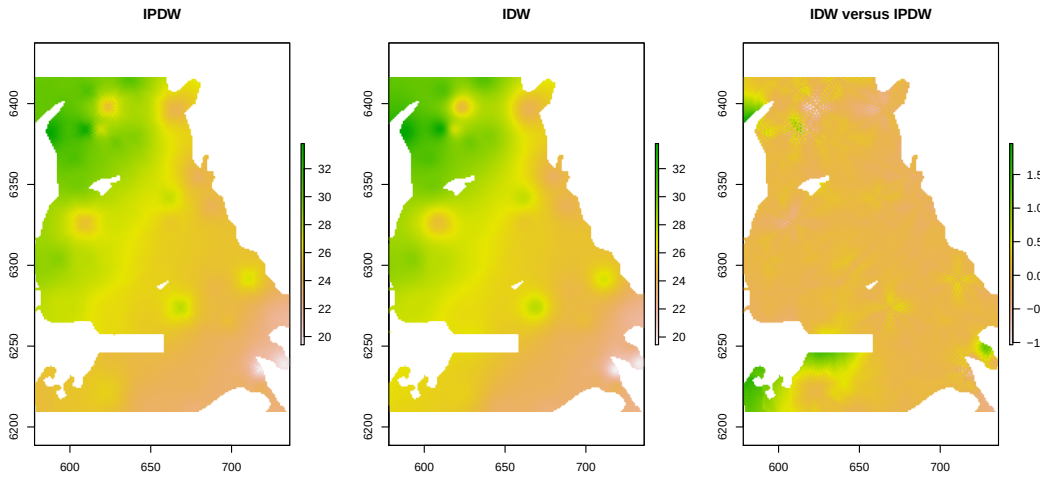
FUTURE DIRECTIONS

- When to use IPDW?
  - gradient intensity
  - coastal "roughness"
- Design of monitoring networks
- Model validation
- Kriging





RESOURCES



http://cran.r-project.org/package=ipdw

- Stachelek J.,C. J. Madden. 2015. Application of Inverse Path Distance Weighting for high-density spatial mapping of coastal water quality patterns »Int. J. Geographical Information Science«

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