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Spatial-Scale Considerations When Evaluating Sediment Transport Model Performance

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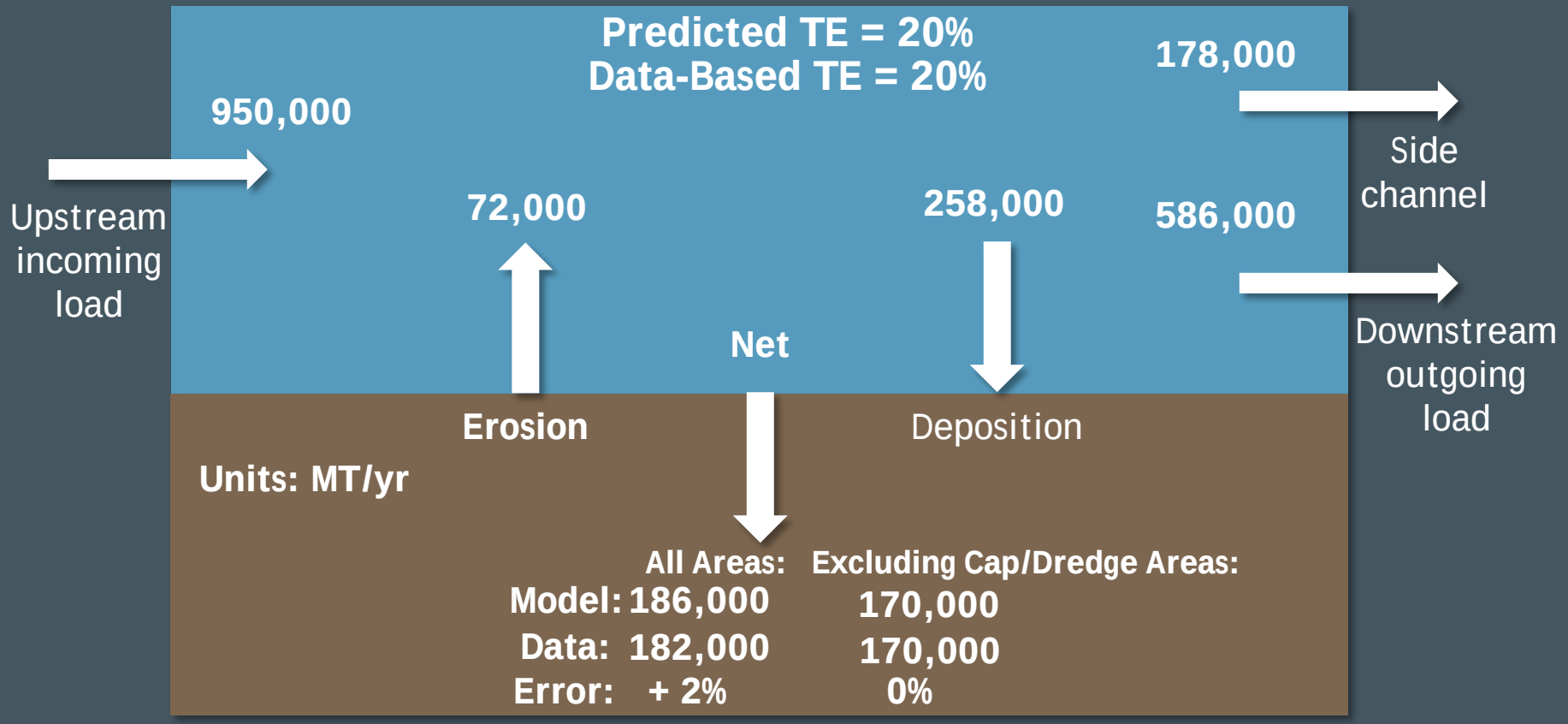
Evaluation of Model Performance: Radioisotope Cores

- At many sites, a limited number of radioisotope (geochronology) cores are available for evaluating model performance
- Typically, 5 to 10 cores provide estimates of net sedimentation rate (NSR) for model calibration
- These data cannot be used to evaluate model performance in areas that are net erosional over multi-year periods

Evaluation of Model Performance: Multi-Beam Bathymetry

- Multi-beam bathymetry data are producing a quantum leap in evaluating model performance
  - Data point(s) in each grid cell
- How should these data be used?
- Over what spatial scales?

Spatial Scale Evaluation:
Entire Study Area



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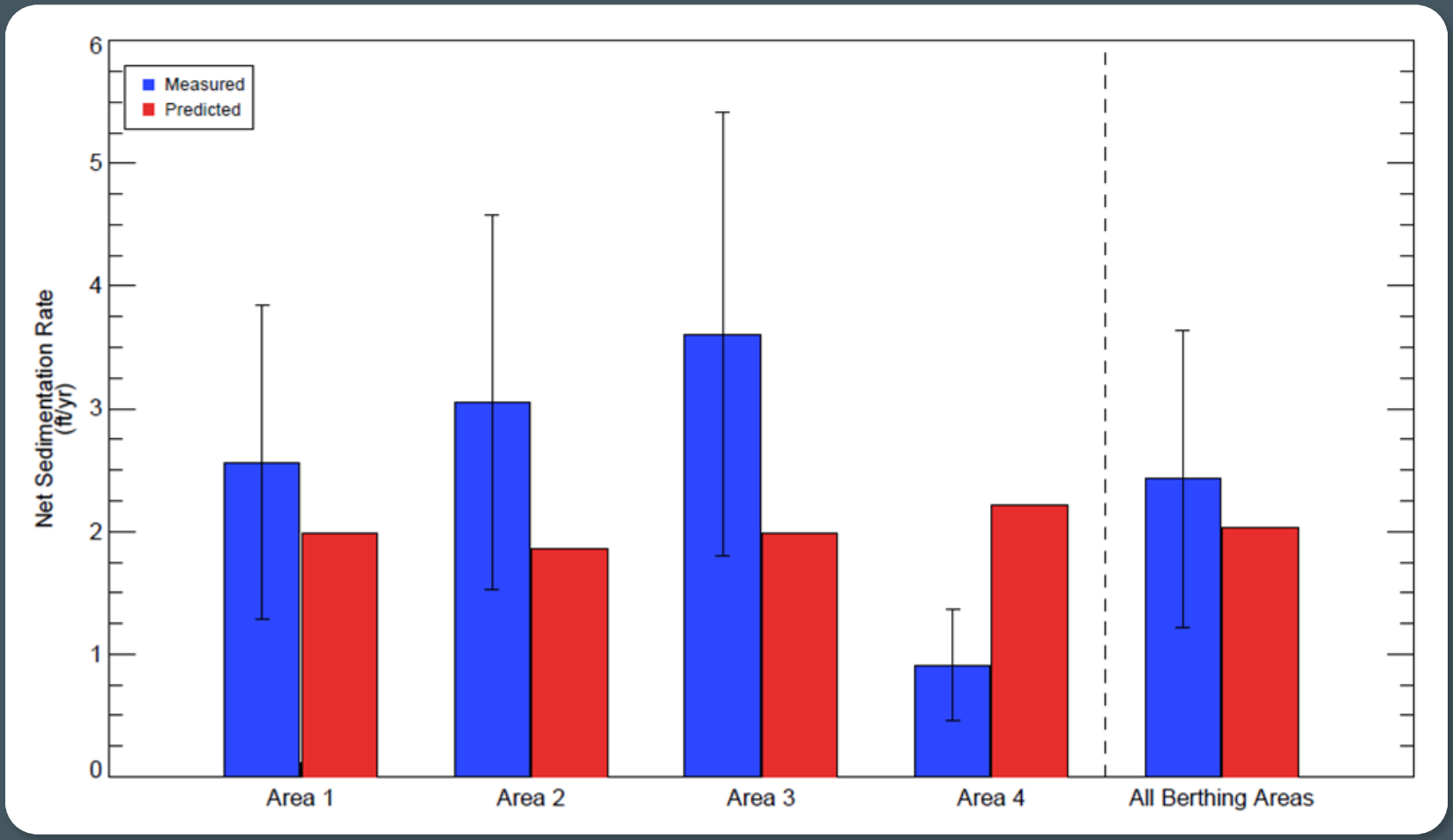
Spatial Scale Evaluation:
Specific Areas Within a Site



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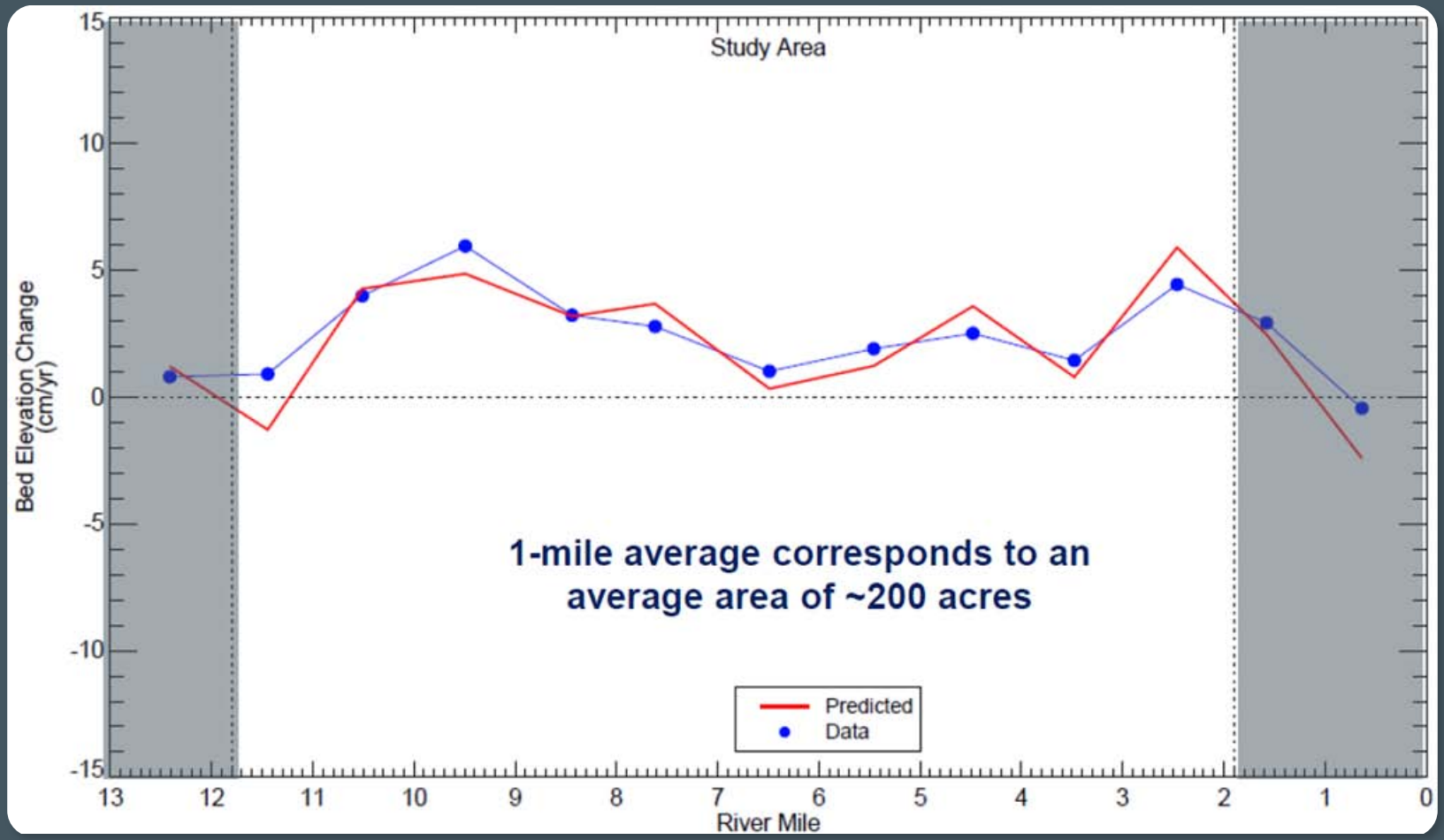
Spatial Scale Evaluation:
Longitudinal Distribution



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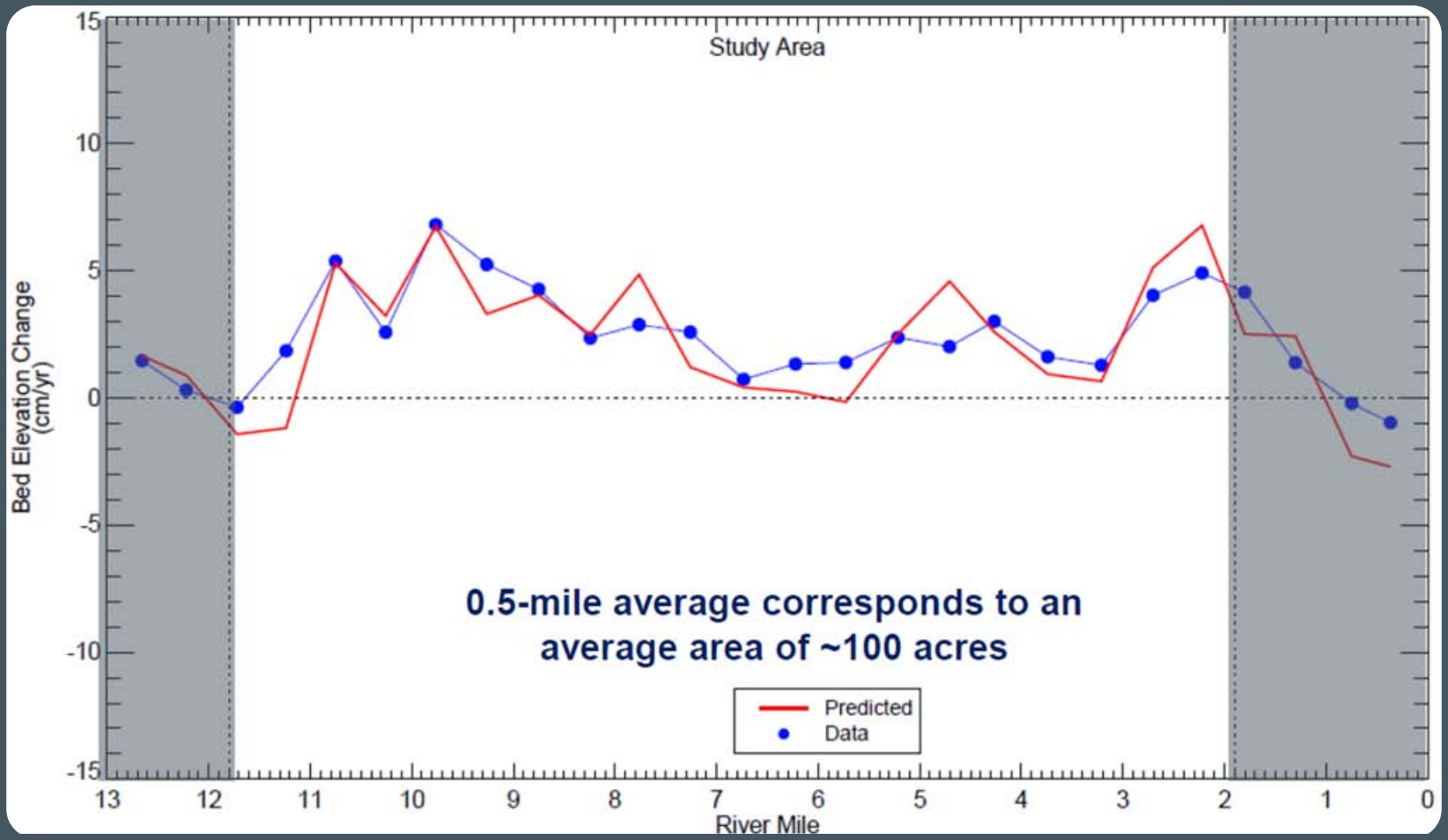
Spatial Scale Evaluation:
Longitudinal Distribution



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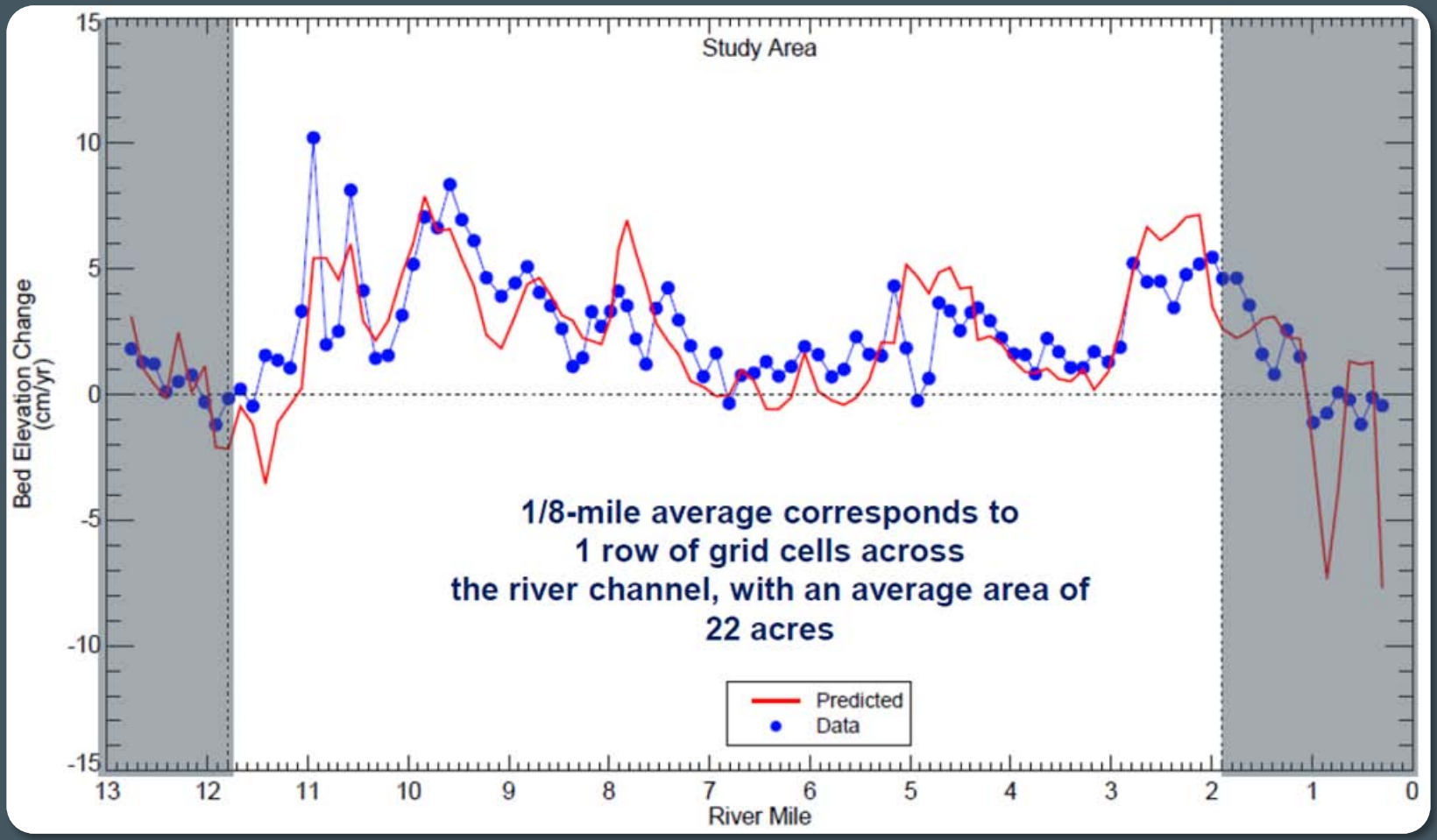
Spatial Scale Evaluation:
Longitudinal Distribution



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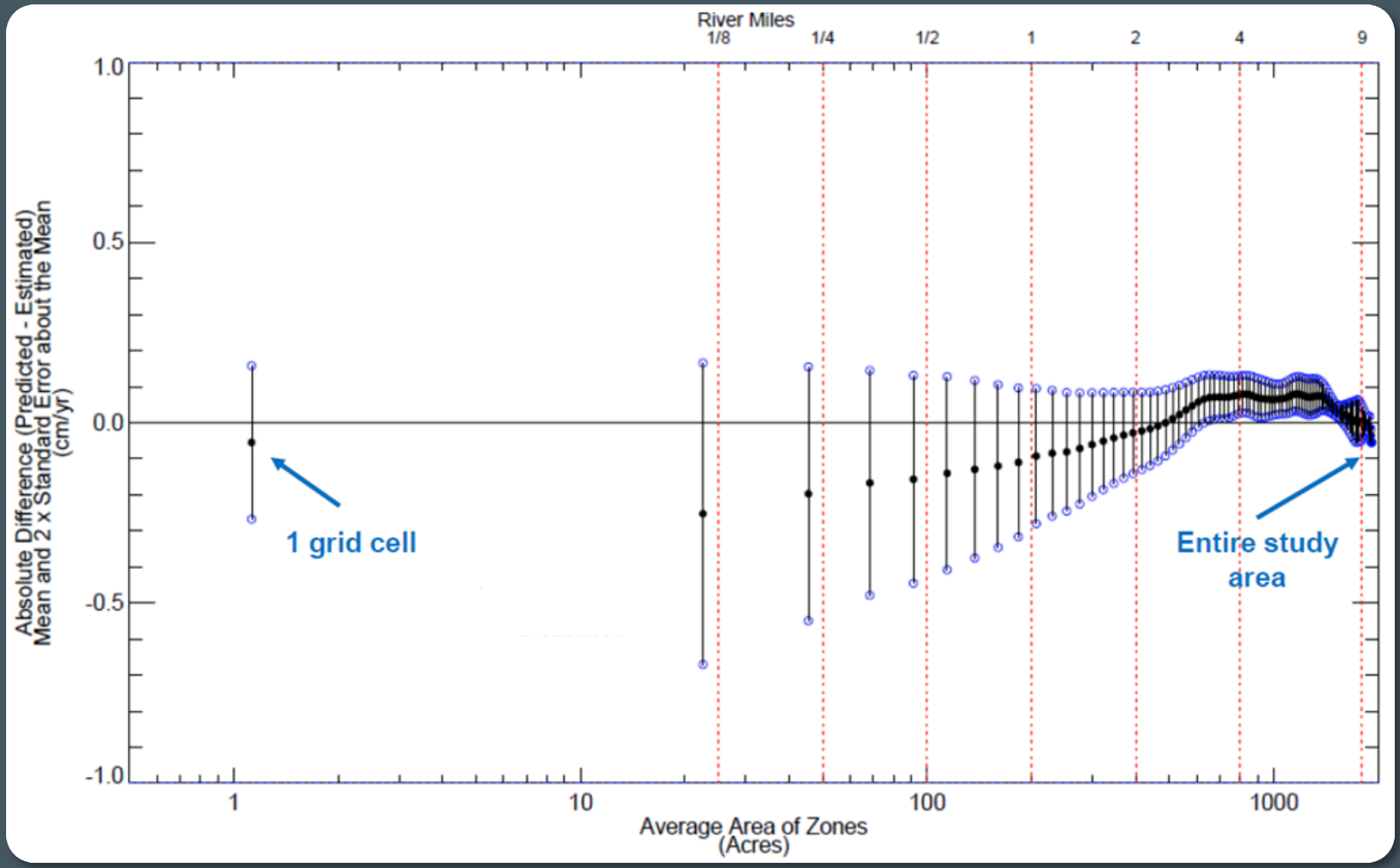
Spatial Scale Evaluation: Single Grid Cell to Entire Study Area – Site 1



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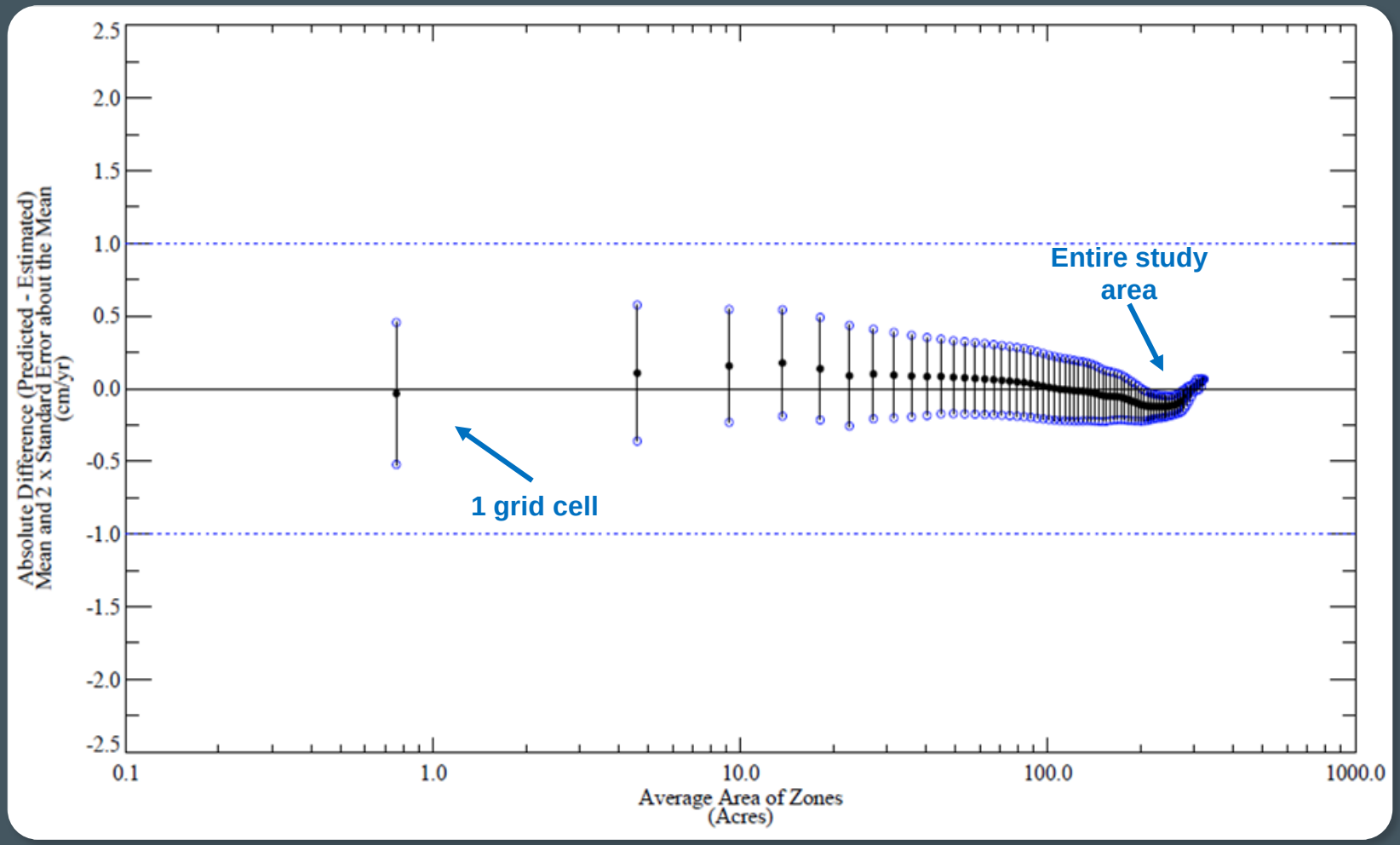
Spatial Scale Evaluation: Single Grid Cell to Entire Study Area – Site 2



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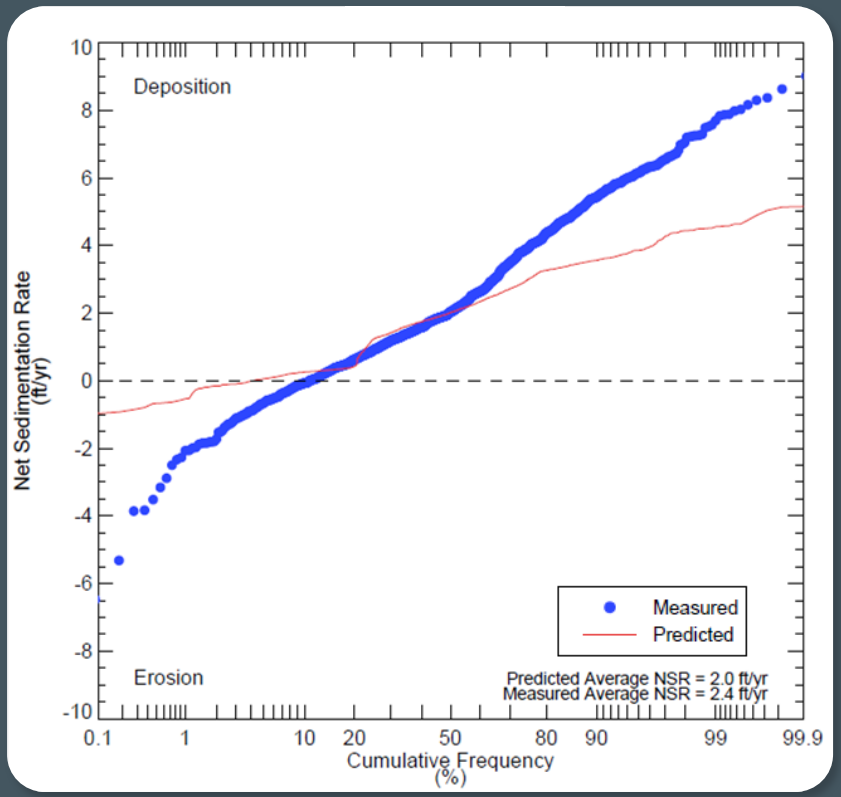
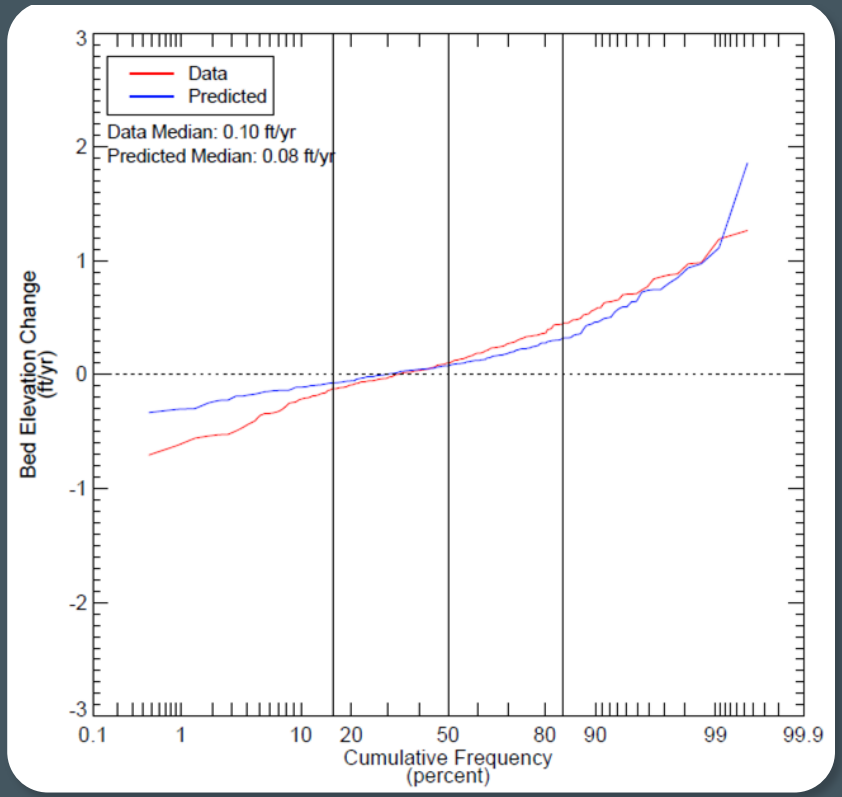
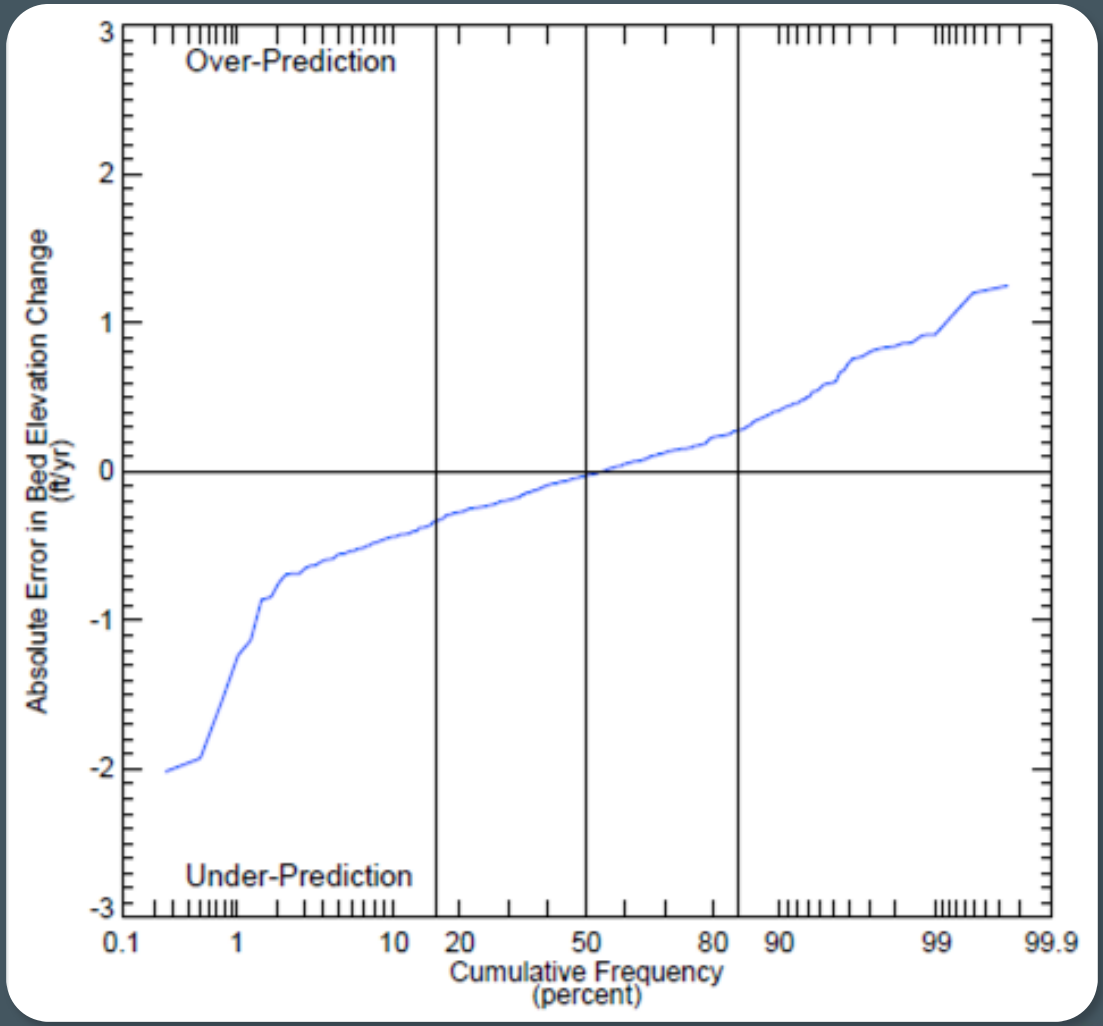
Spatial Scale Evaluation:
Single Grid Cell – Distributions





Spatial Scale Evaluation:
Single Grid Cell – Error Analysis



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Spatial Scale Evaluation: Insights

- Evaluating model performance over a wide range of spatial scales helps to
  - Increase confidence in predictions
  - Inform the conceptual site model
- Variability in model predictive capability tends to increase as spatial scale decreases
  - Typical behavior for a high resolution model
- Generally, model bias is relatively consistent over the range of spatial scales (i.e., single grid cell to entire study area)