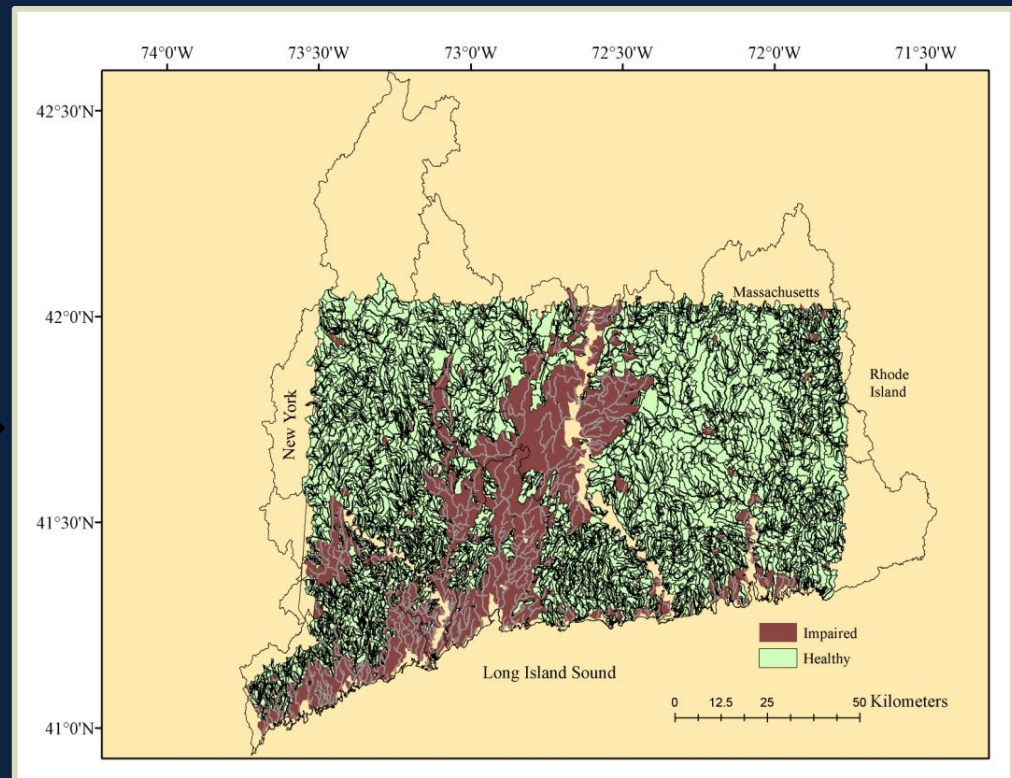
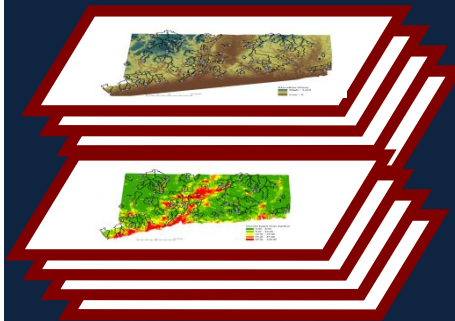


Modeling the Health of Wadeable Streams in Connecticut Using Biomonitoring Information and Watershed Characteristics

Biomonitoring
Information and GIS
Data Layers



Christopher Bellucci, Mary Becker, Mike Beauchene, and Lee Dunbar

2012 National Monitoring Conference, Portland, OR

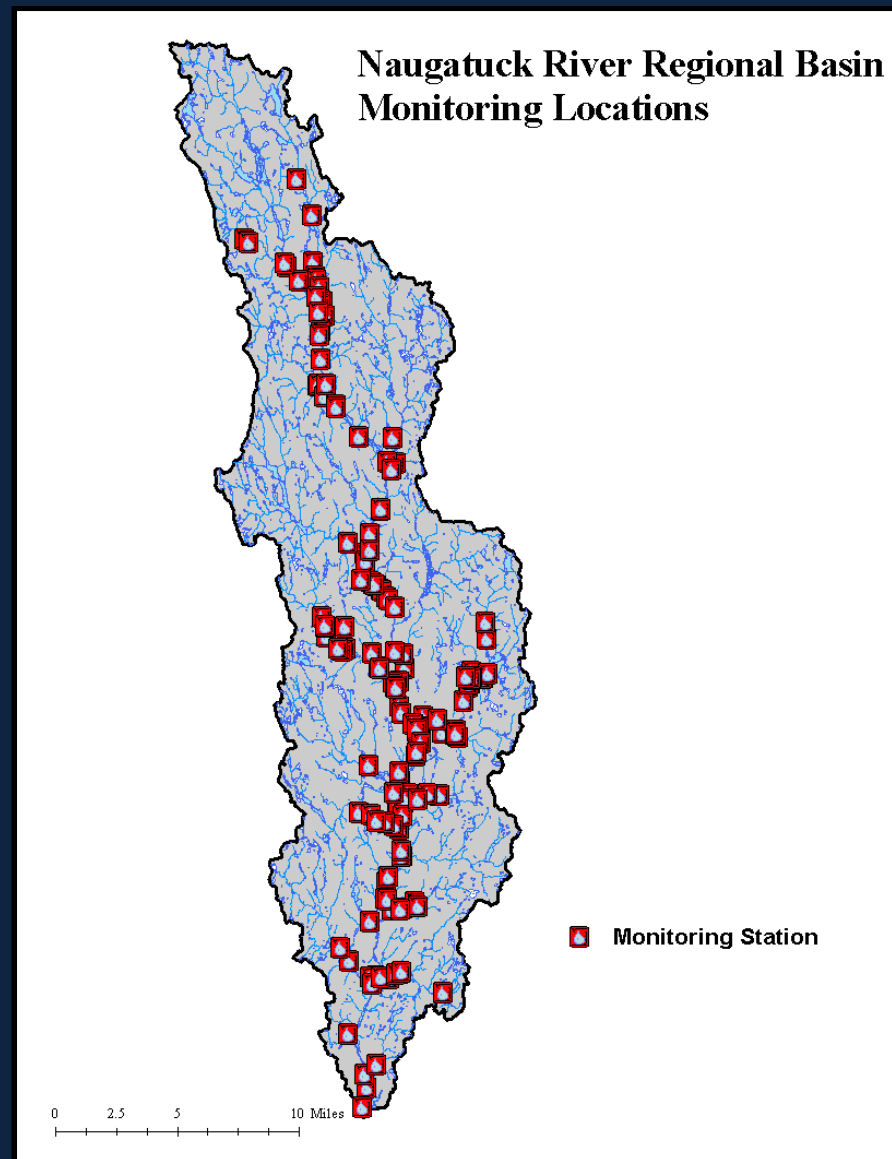
Current Tools to Support Water Quality Management

Targeted Monitoring

- Assess WQS Attainment
- Measure localized trends
- Stressor ID
- Support development of local management measures (TMDLs, NPDES permits, NPS BMPs)

Limitations

- Costly to conduct
- Not enough man-power or money to implement everywhere
- Can't make general statements about stream quality in Connecticut



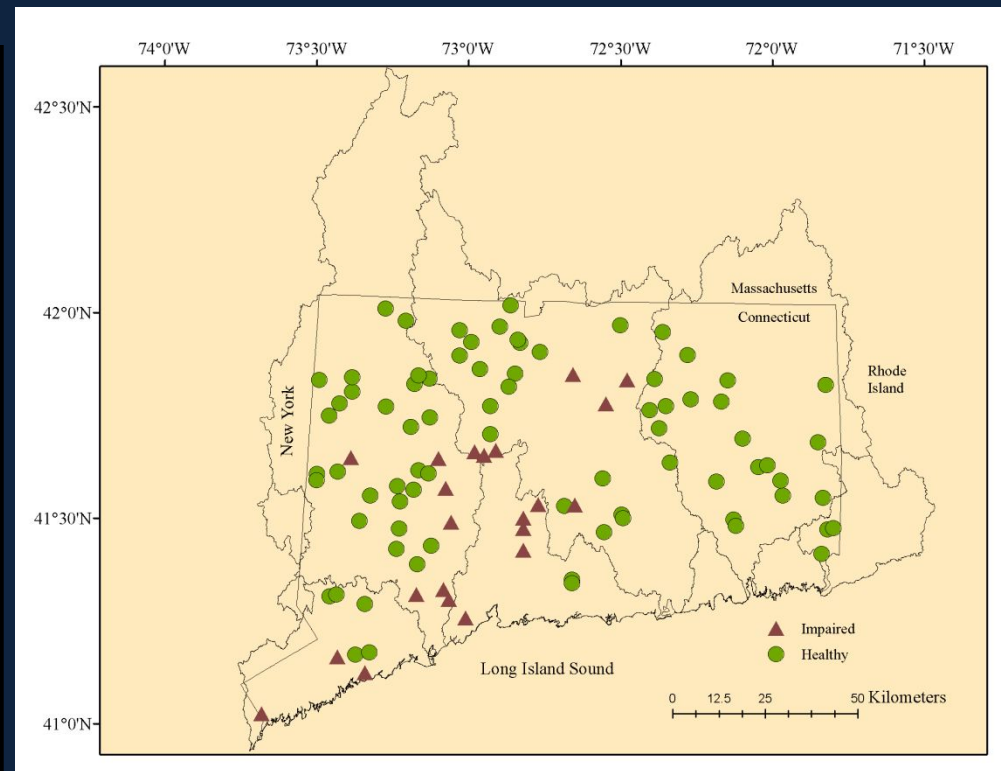
Current Tools to Support Water Quality Management

Statistical Monitoring

- Estimate proportion of waters supporting water quality goals in CT
- Measure overall state-wide water quality trends
- Support development of new water quality standards

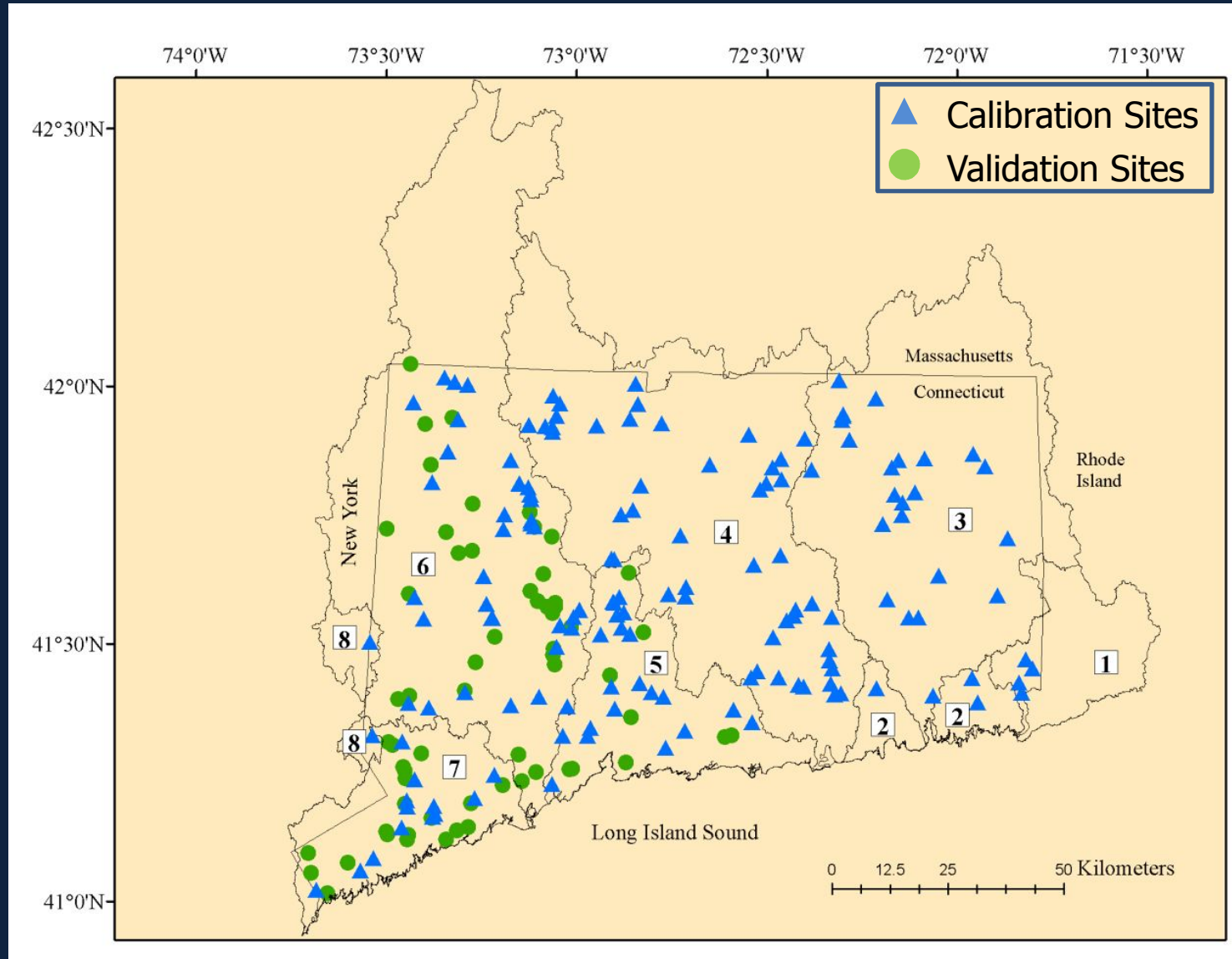
Limitations

- Only provides a 'number' for reporting, does not provide site-specific estimates of water quality state-wide

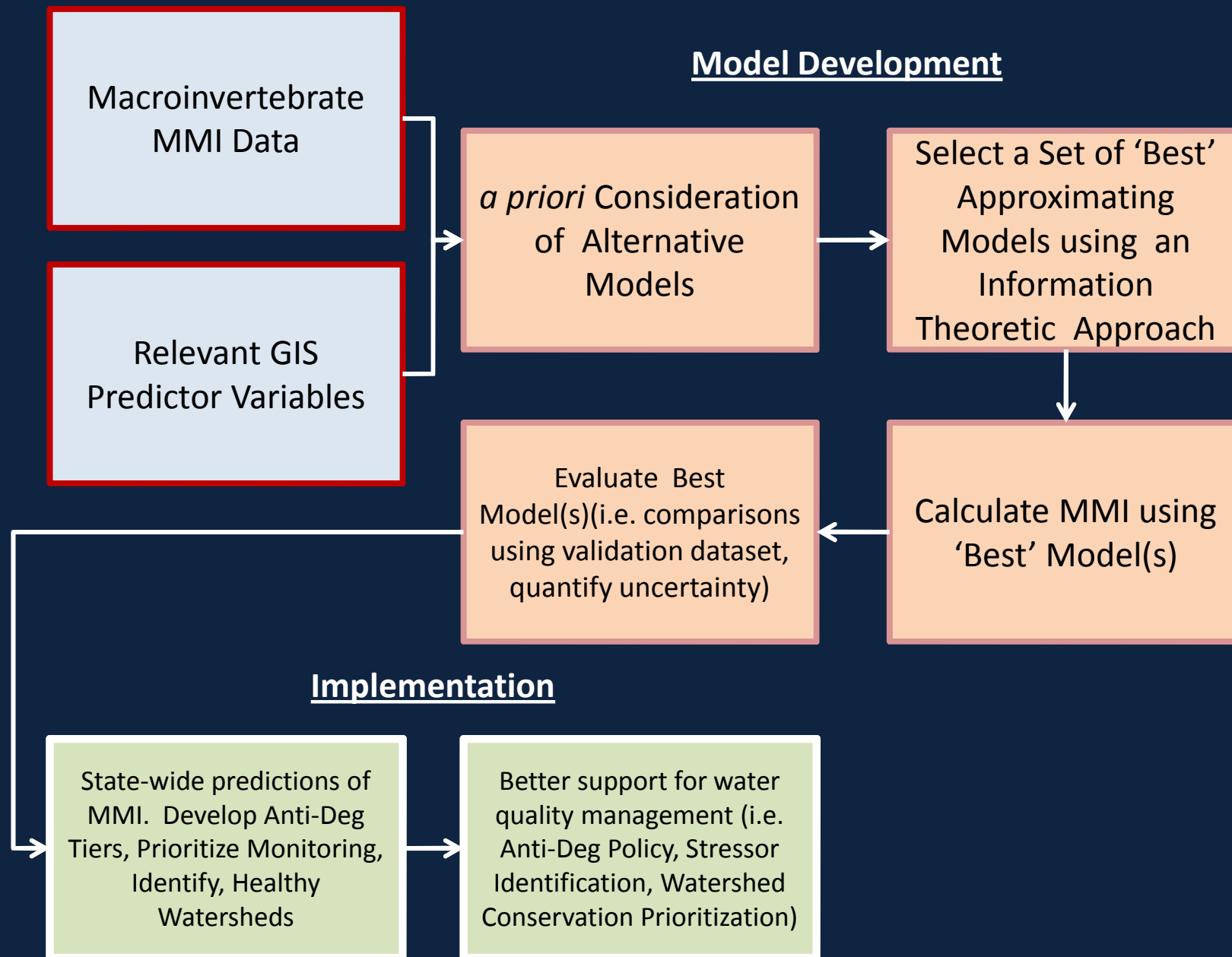


✓ 76 % Healthy, 24% Impaired

New Tool to Support Water Quality Management

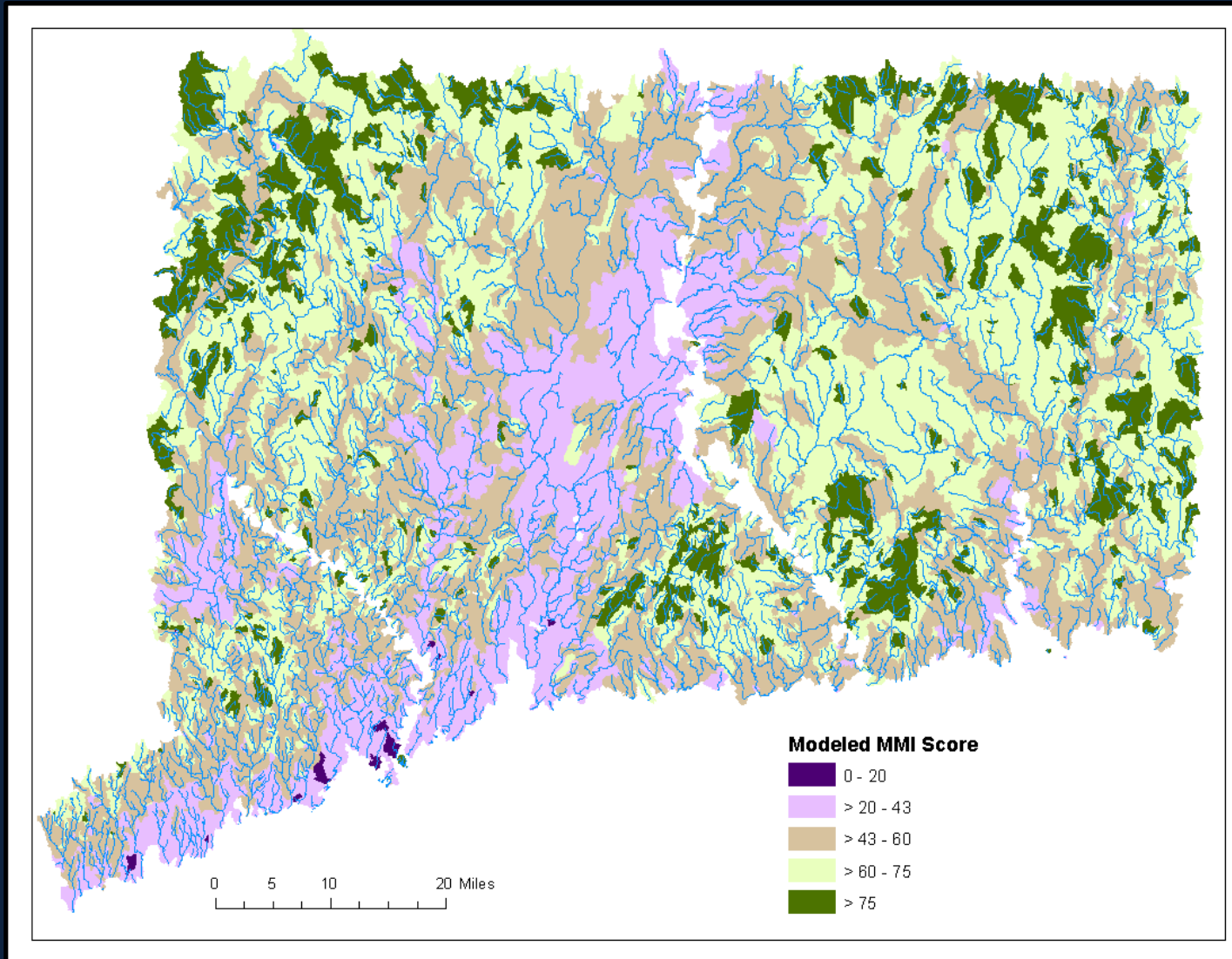


New Tool to Support Water Quality Management

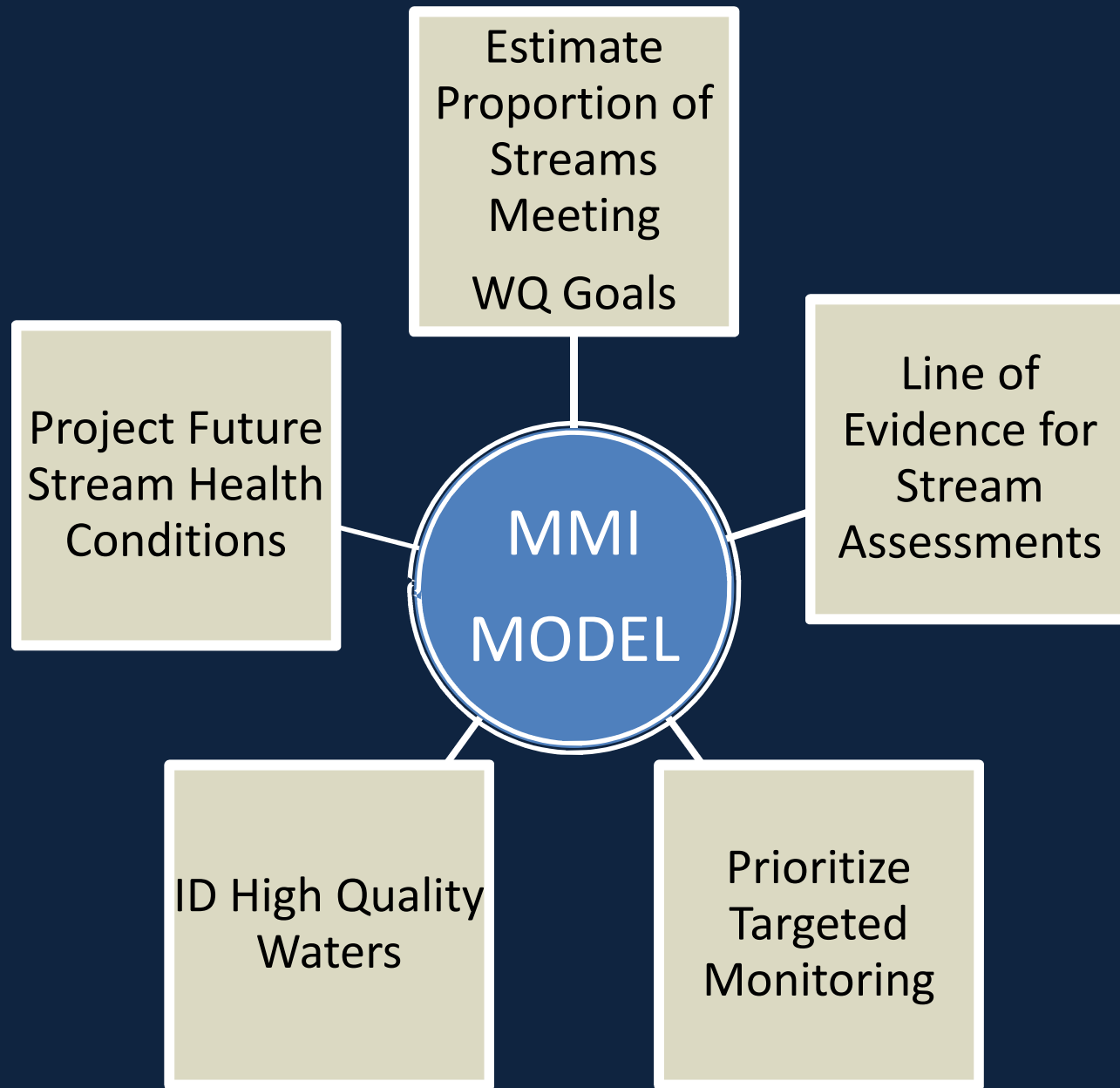


New Tool to Support Water Quality Management

Best Model had IC, Wetlands, Slope



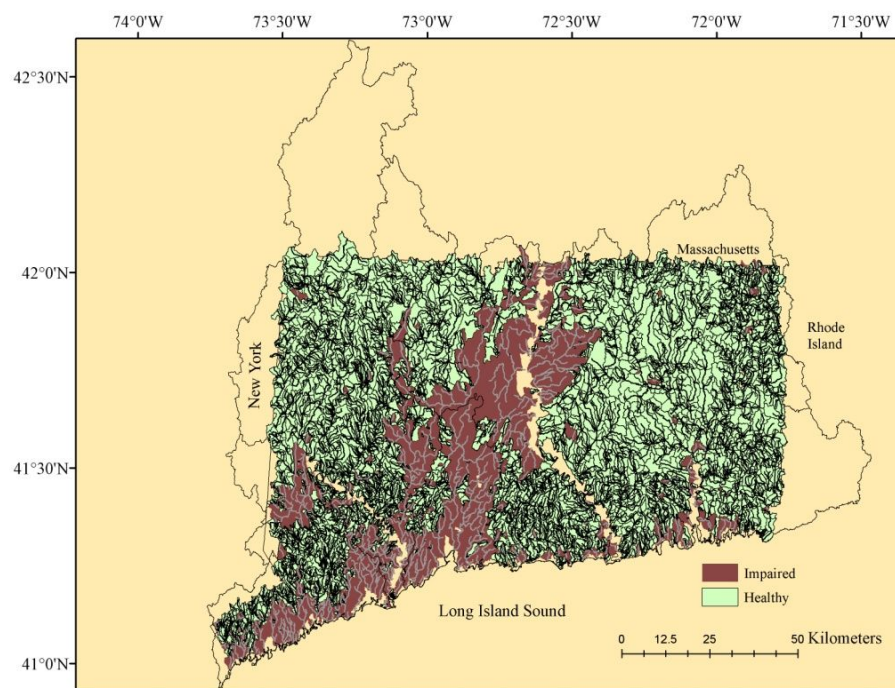
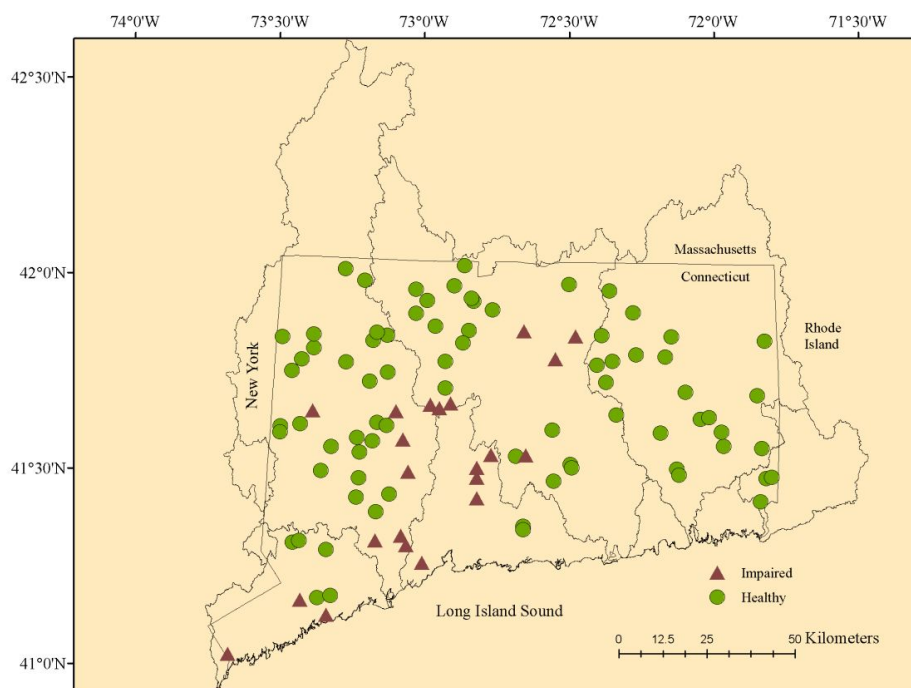
Implementation – Some Potential Uses



State-wide Assessments Lead to Better Management

GRTS Design

MMI Model



Statistical Design	Healthy Streams (%)	Impaired Streams (%)	Standard Error
GRTS Design	76 (71 – 81)	24 (19 – 29)	2.61

Statistical Design	Healthy Streams (%)	Impaired Streams (%)	Standard Error
Model	76 (53 – 99)	24 (0.5 – 47)	11.73

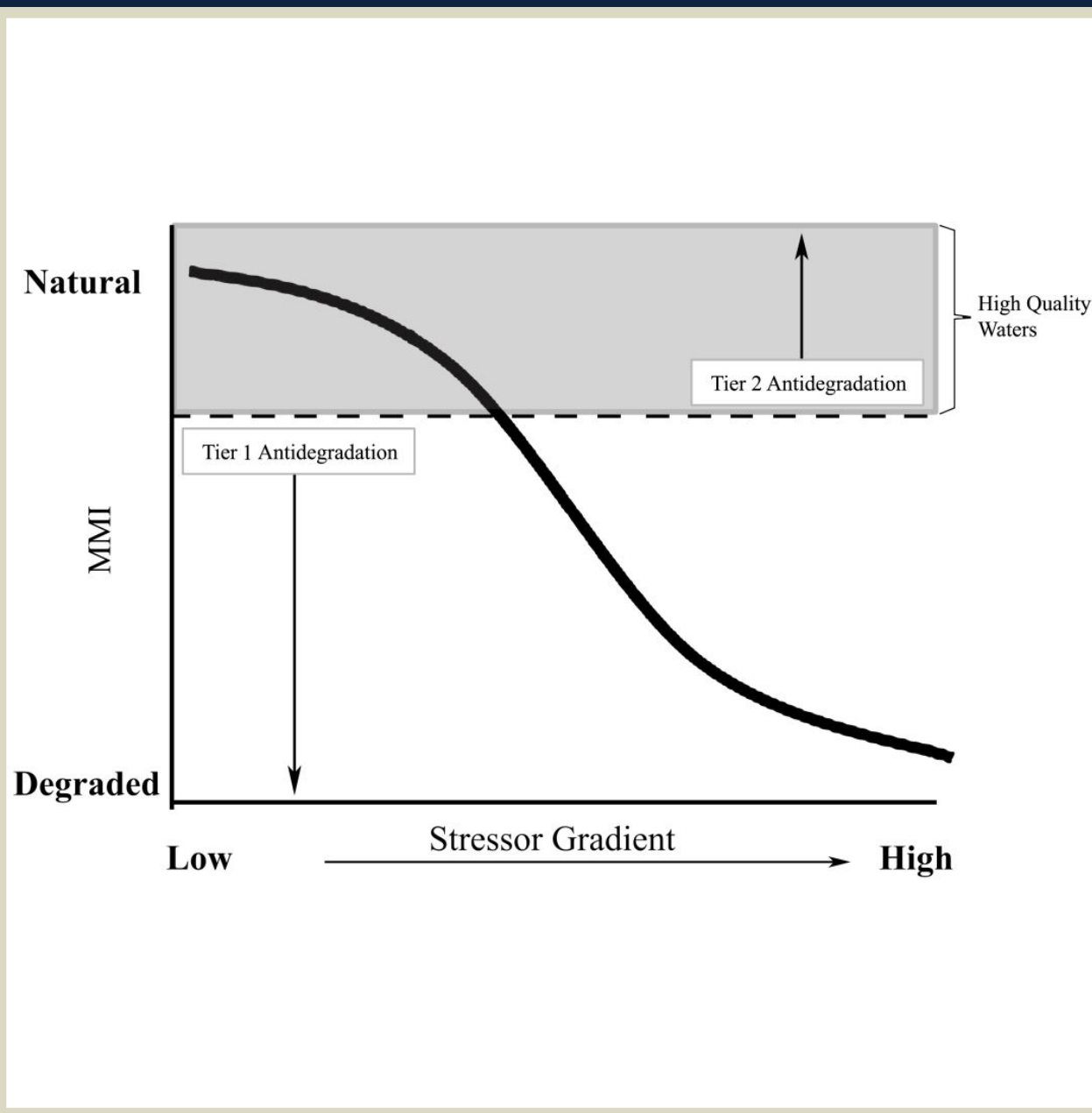
95th percentile confidence limits in ()

Using the Model to Support Aquatic Life Assessments

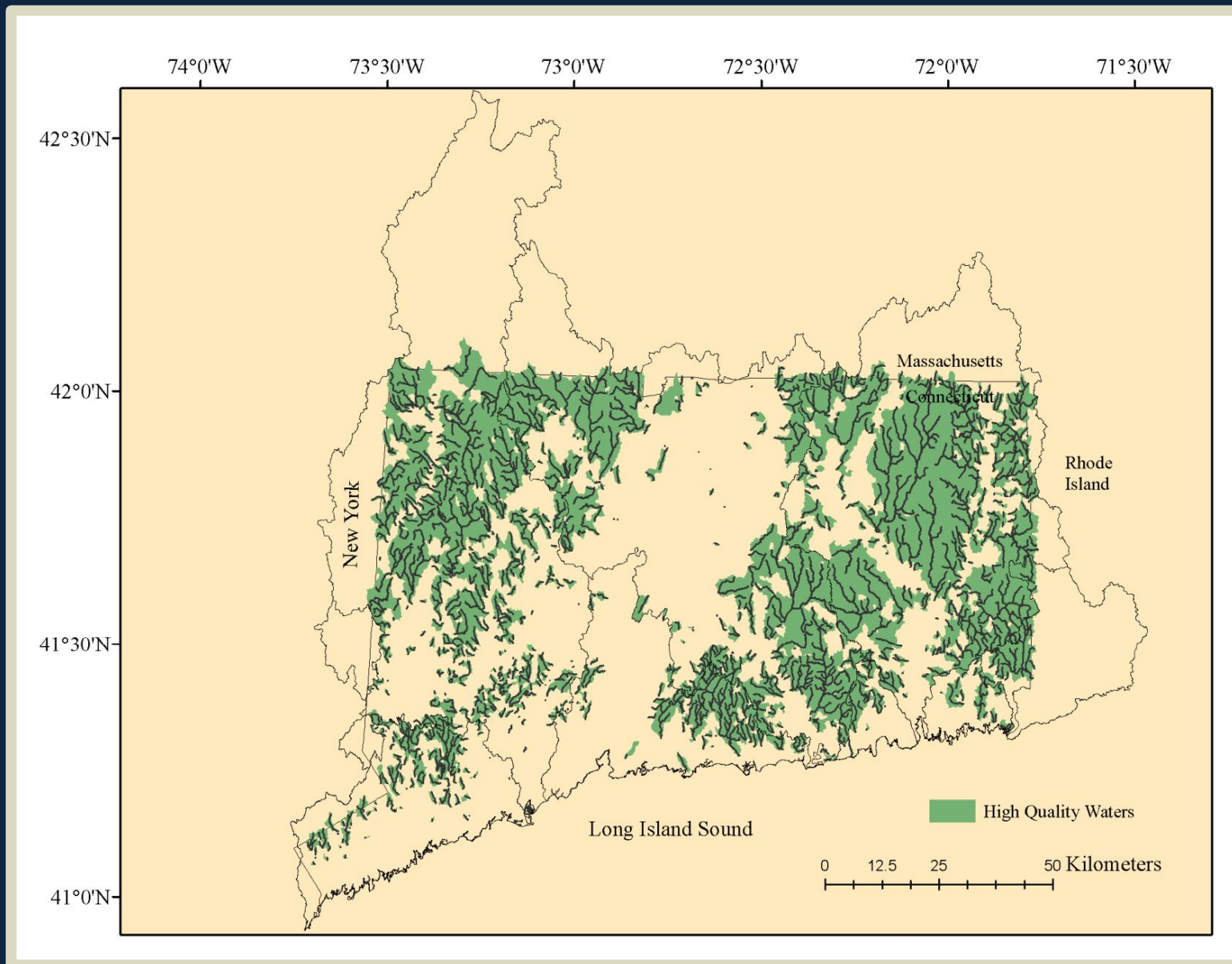
Stream Name	Station ID	BCG Level	Measured MMI	Model MMI	Fish	RBV	Chem	ALUS Assessment
Pendleton Hill Brook	1748	2	77.04	77.11	Pass	x	No exceeds	FS
Bone Mill Brook	1456	x	x	94.30	Pass	x	No exceeds	FS
Cranberry Meadow Brook	5153	x	x	65.47	Pass	Pass	No exceeds	FS
Hunts Brook	1194	5	41.06	59.98	Fail	x	No exceeds	NS

X – No data
 FS – Fully supporting
 NS – Not supporting

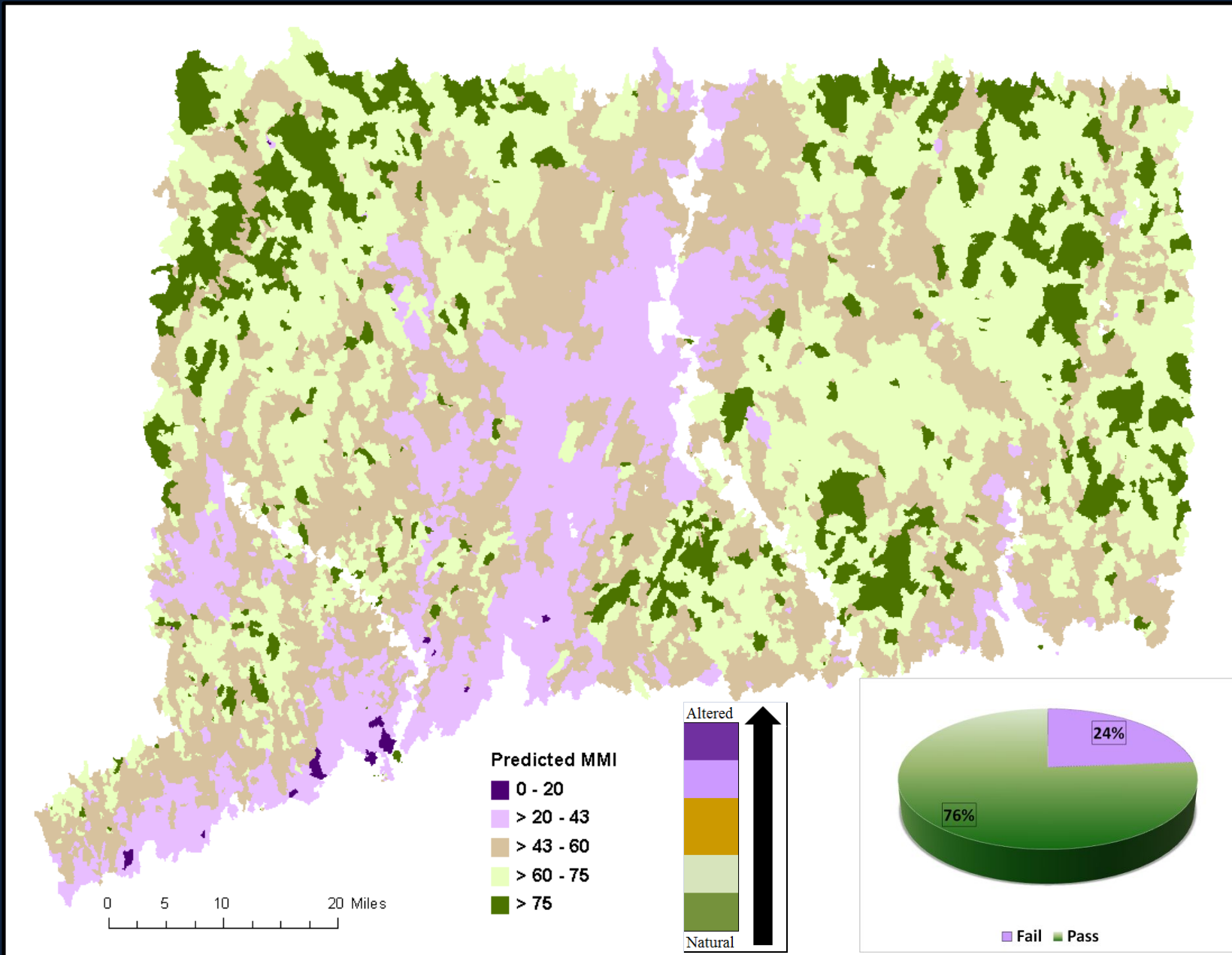
Using the Model to Support Anti-degradation Policy



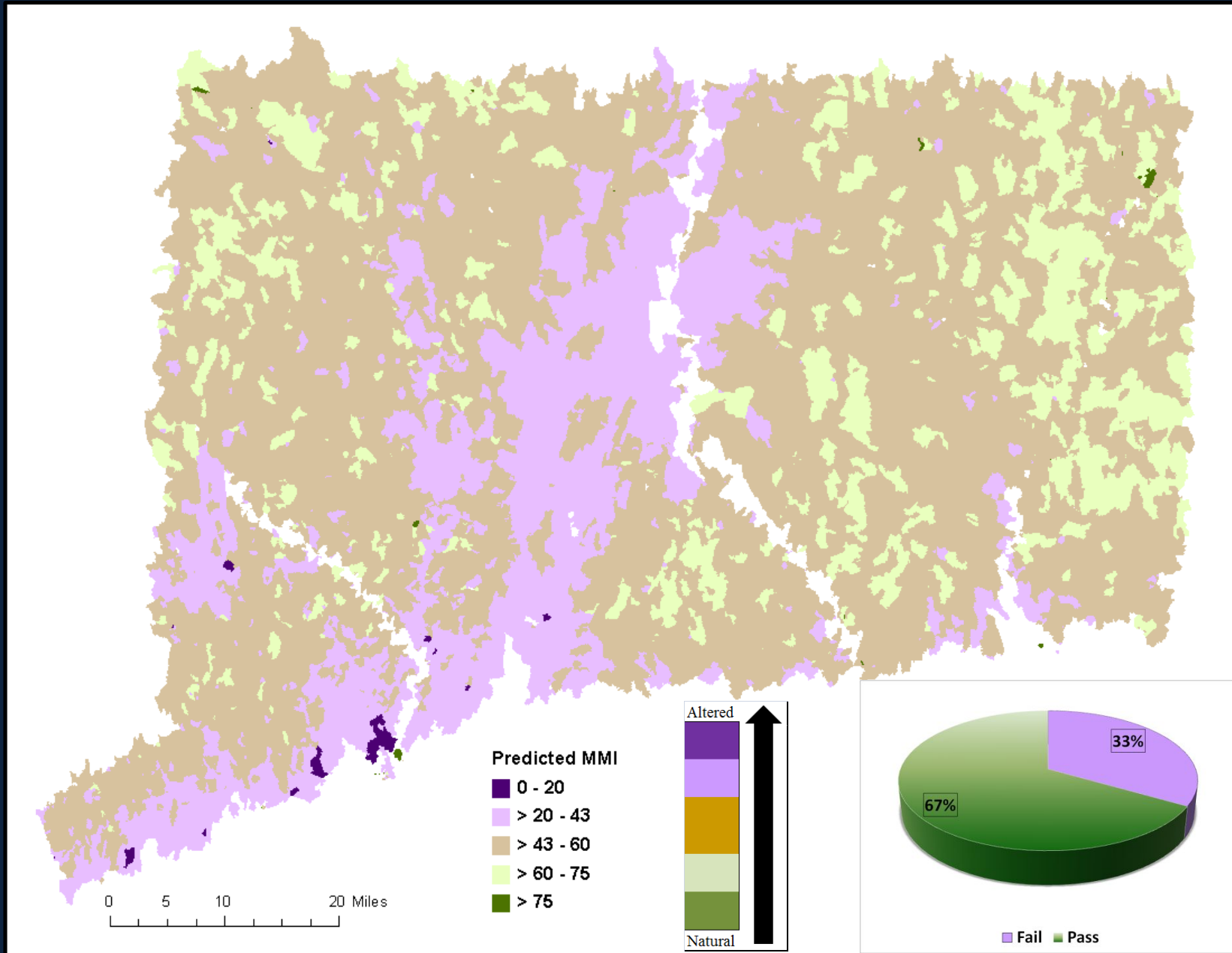
Identify High Quality Waters



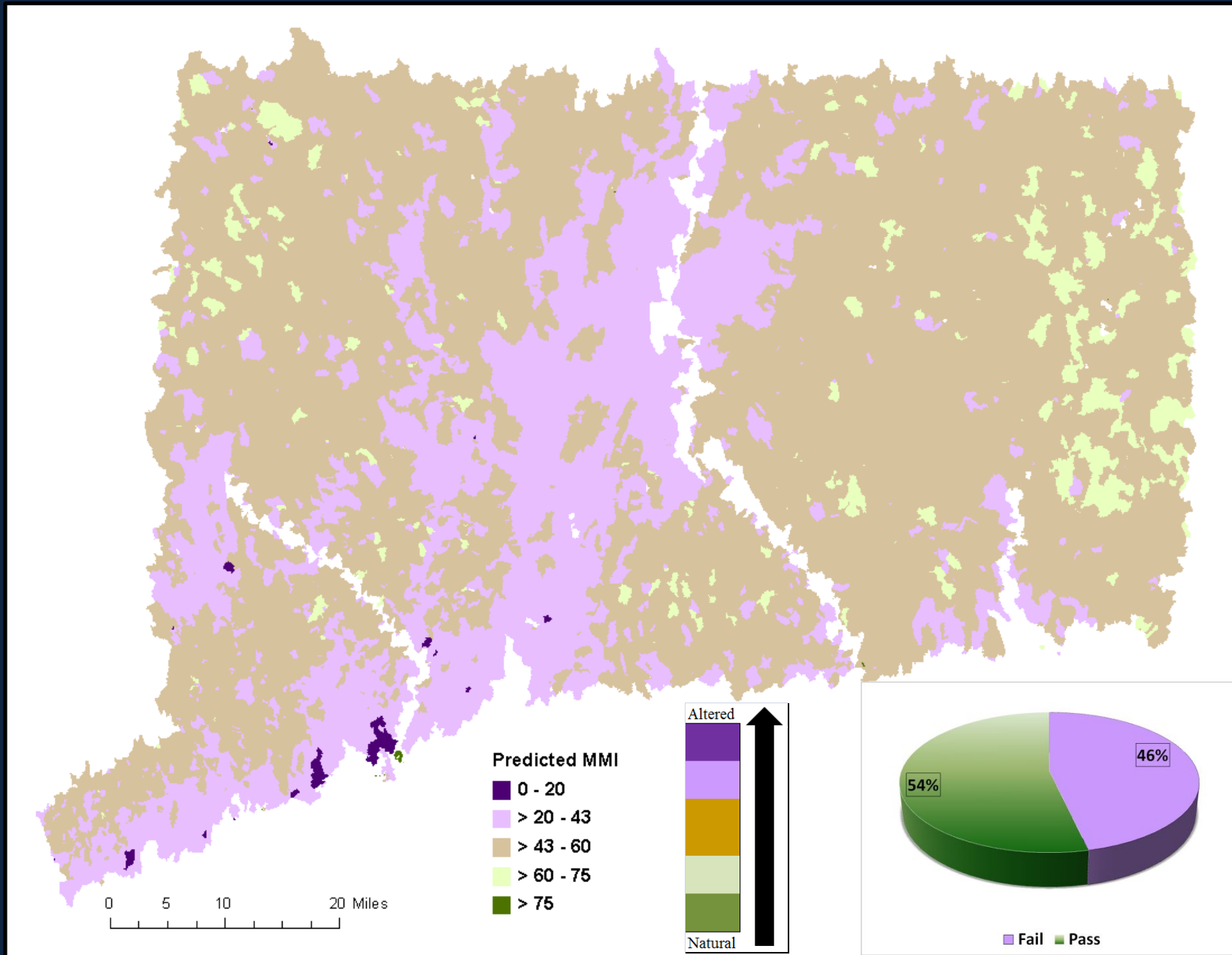
Build Out Analysis – Current Condition



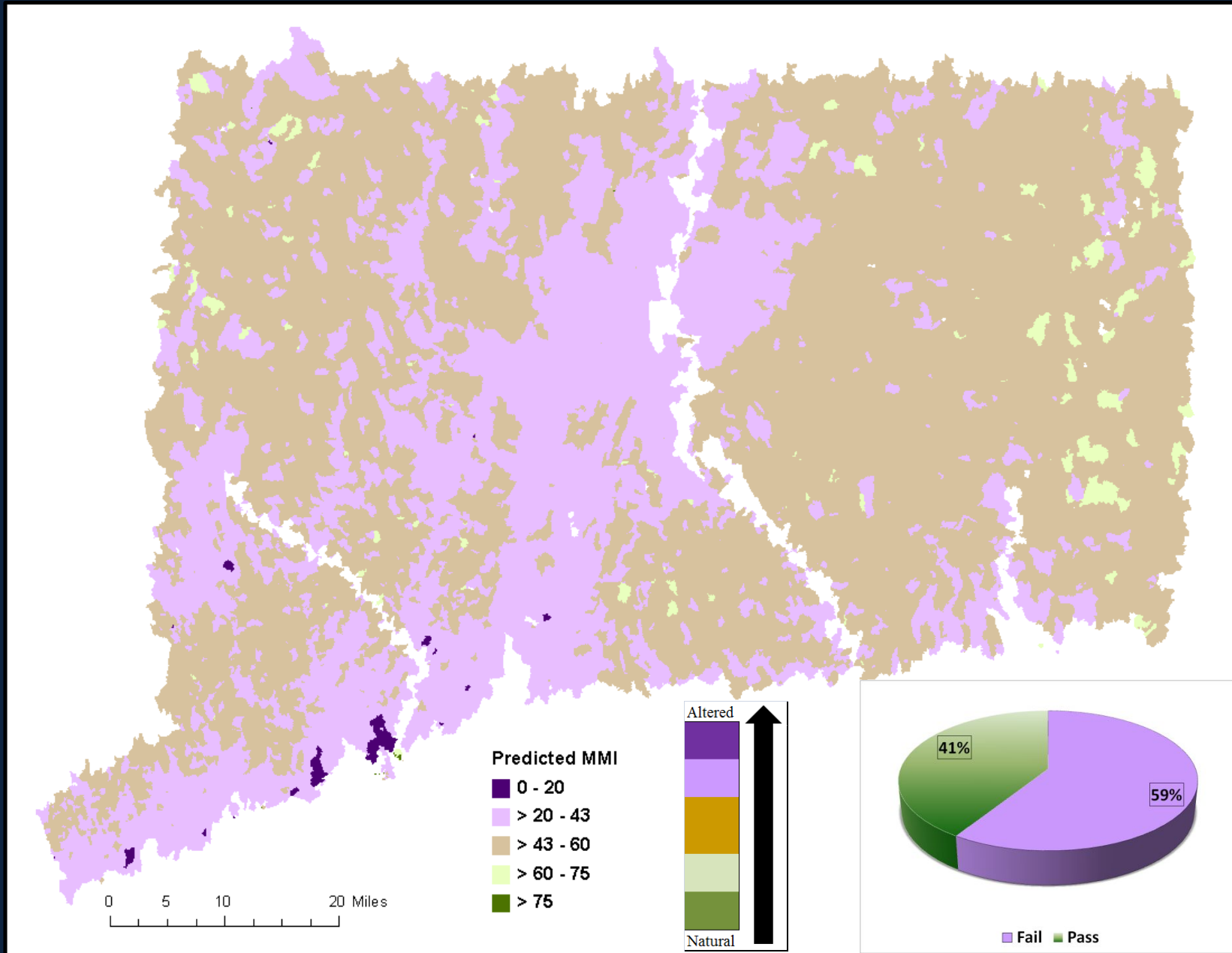
Build Out Analysis – +2% IC



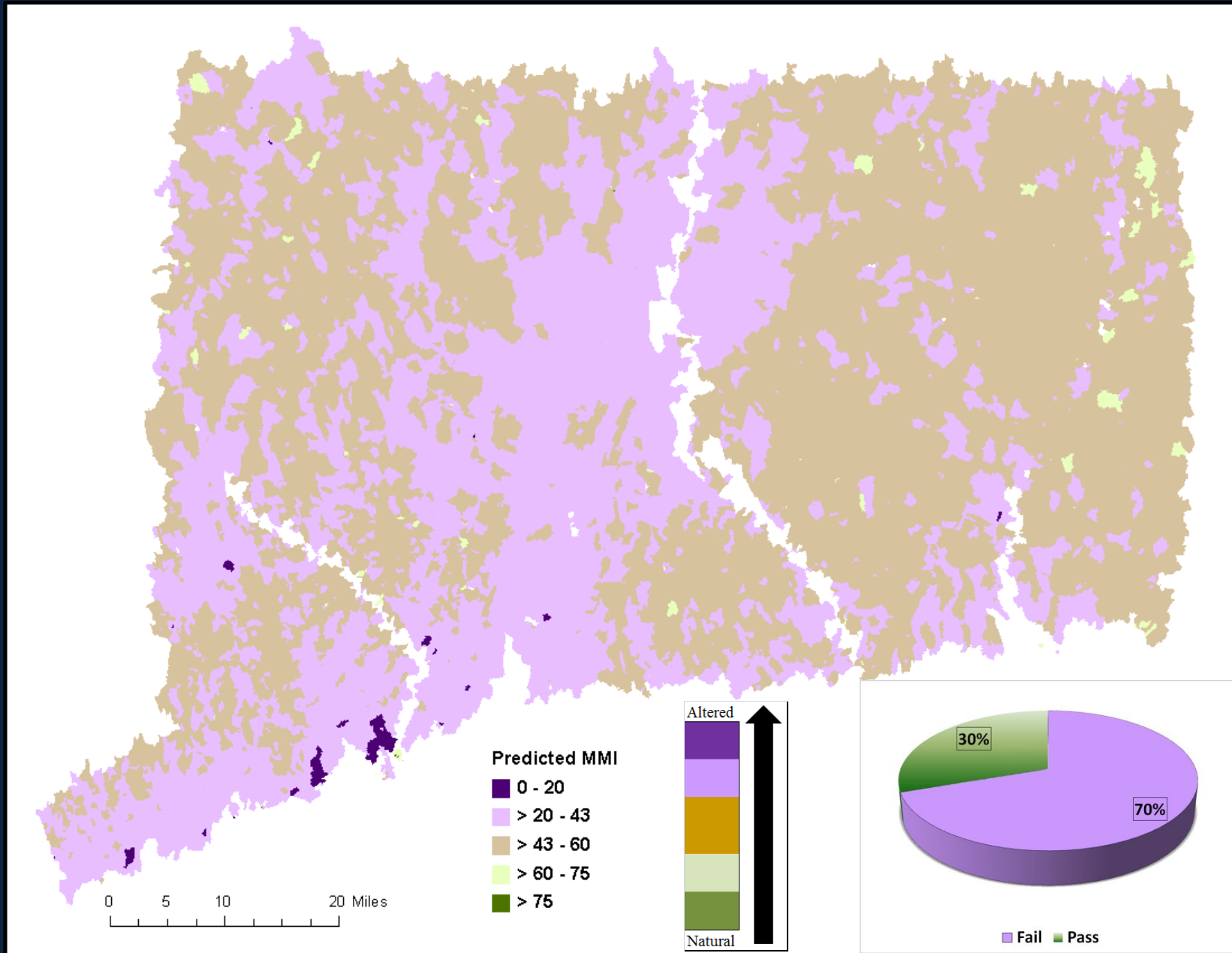
Build Out Analysis – +4% IC



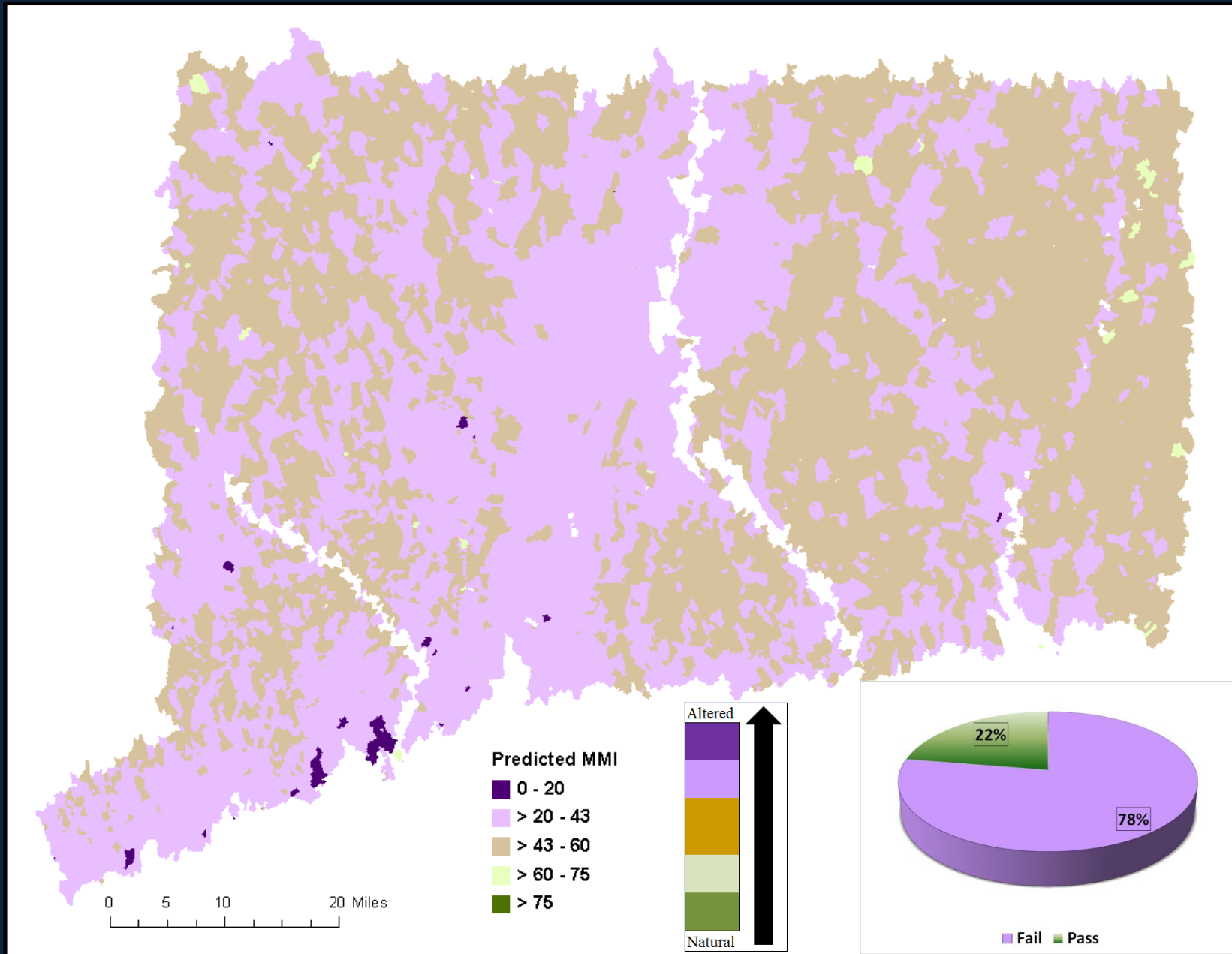
Build Out Analysis – +6% IC



Build Out Analysis – +8% IC



Build Out Analysis – +10% IC



Questions ???



Bureau of Water Protection and Land Reuse
79 Elm Street, Hartford, CT 06106

christopher.bellucci@ct.gov
860-424-3735