

FISH HABITAT QUALITY & SUPPLY IN THE NEARSHORE


FOCUS ON LAKE ERIE AND THE
ST CLAIR – DETROIT RIVER SYSTEM



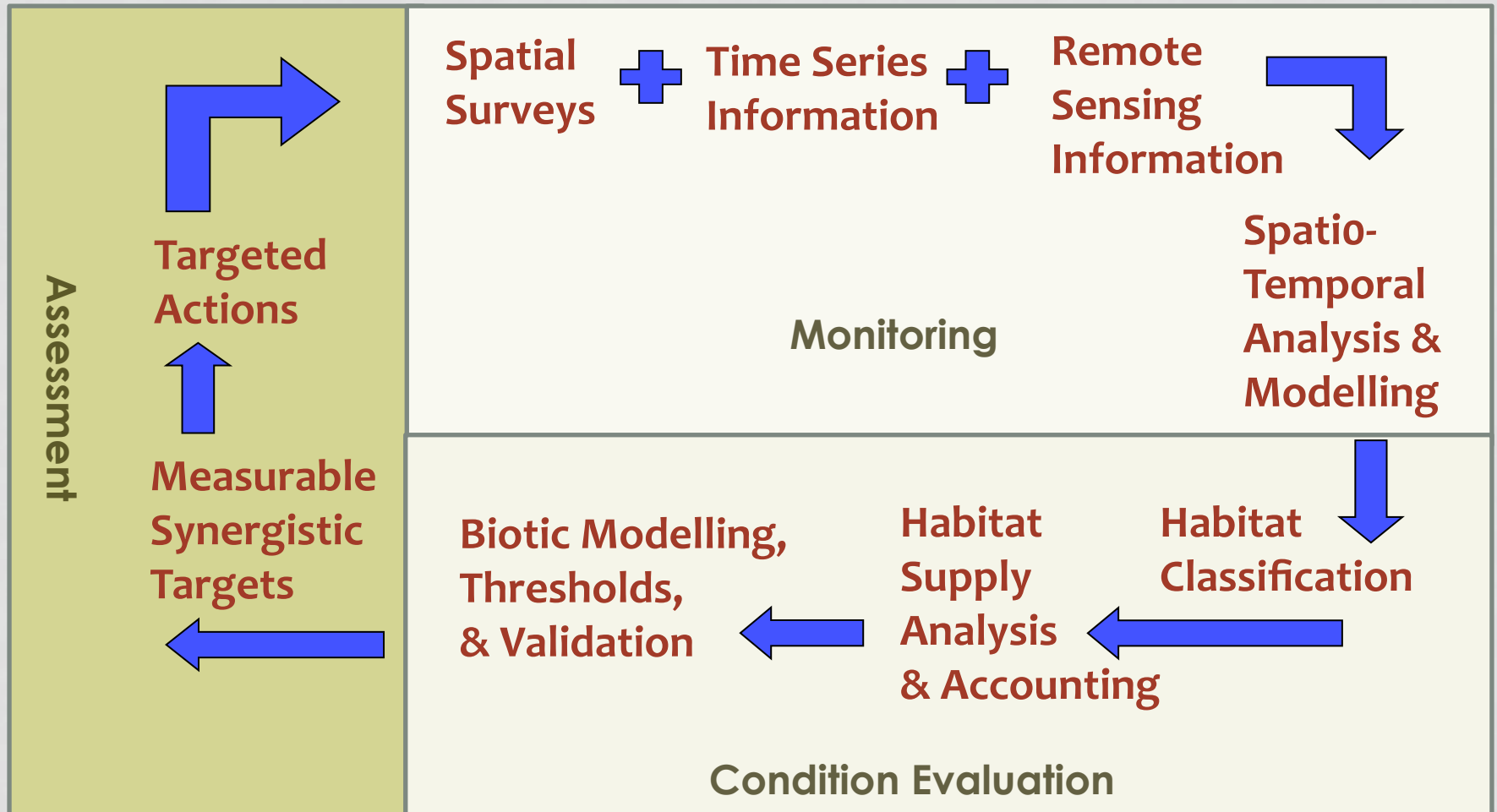
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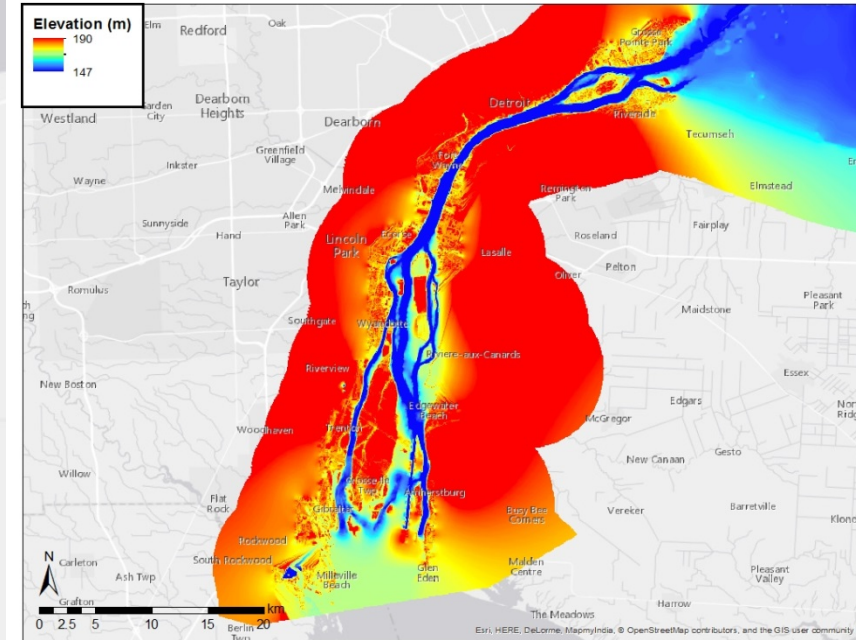
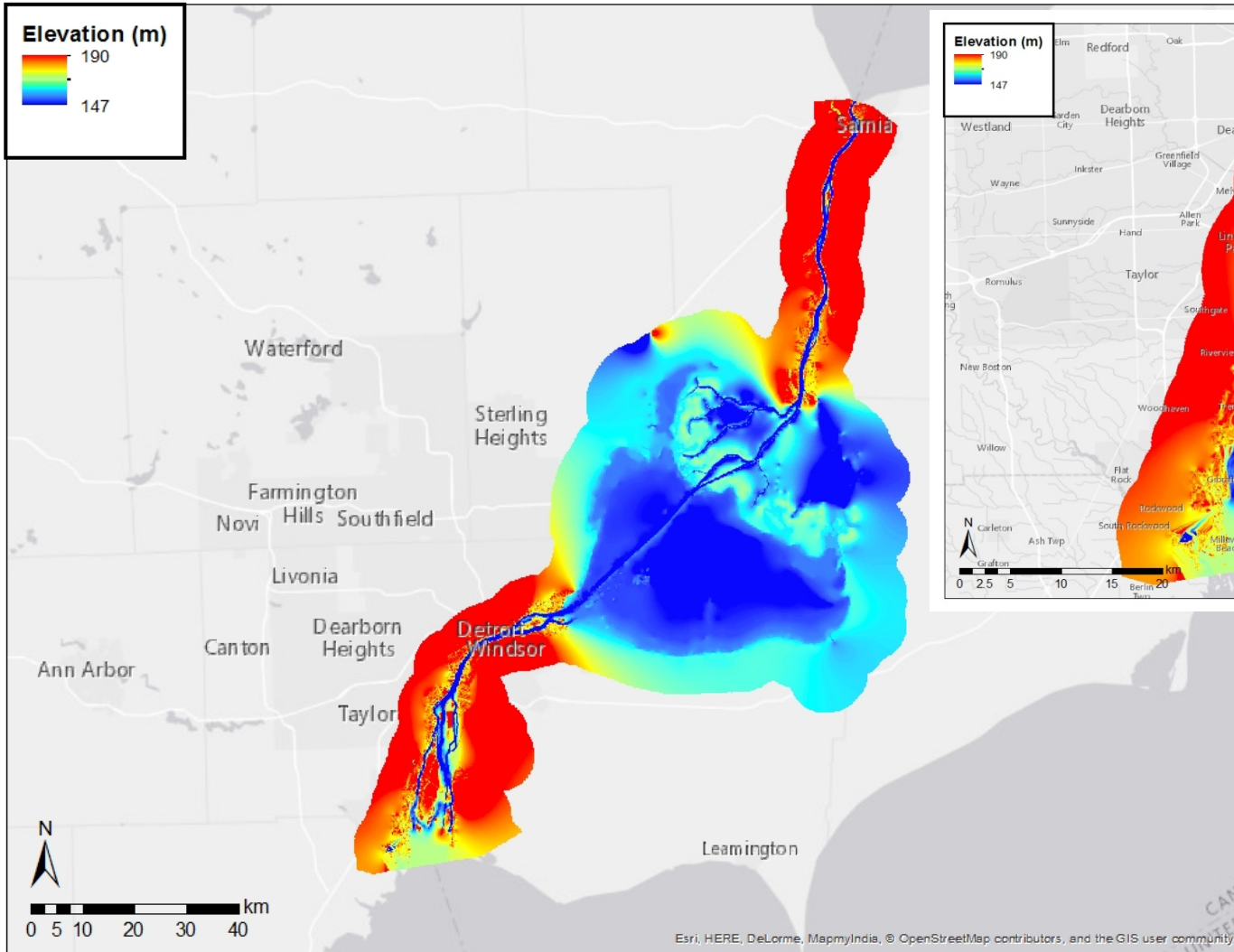
GOALS

- 
- To determine where are the areas that should be conserved and protected
 - To evaluate what features have been lost and determine what can or has been restored
 - To determine what features may benefit diversity and production the most
 - To evaluate actions to ensure there is a net gain in habitat supply

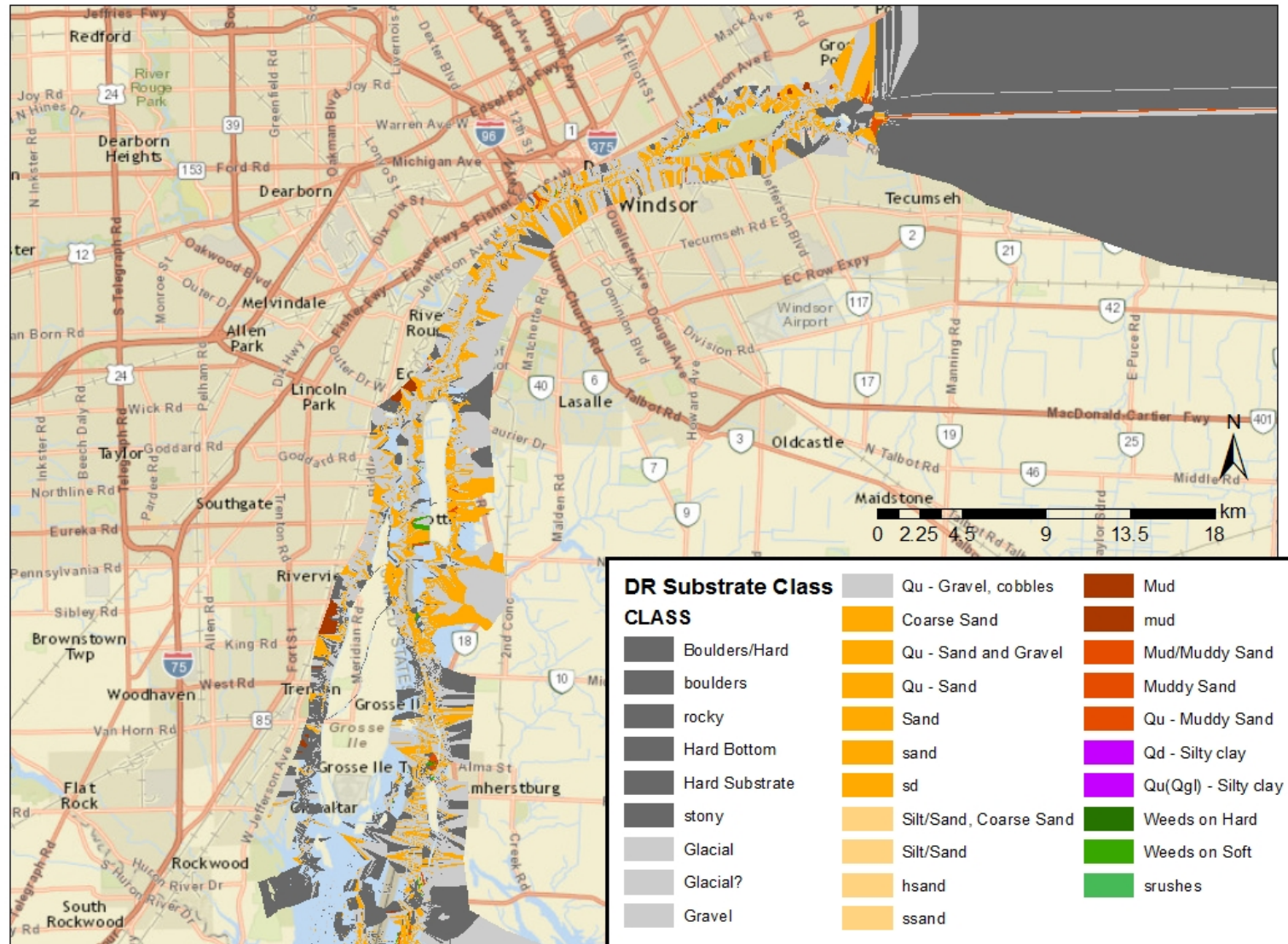
CYCLE OF MONITORING, EVALUATION & ASSESSMENT



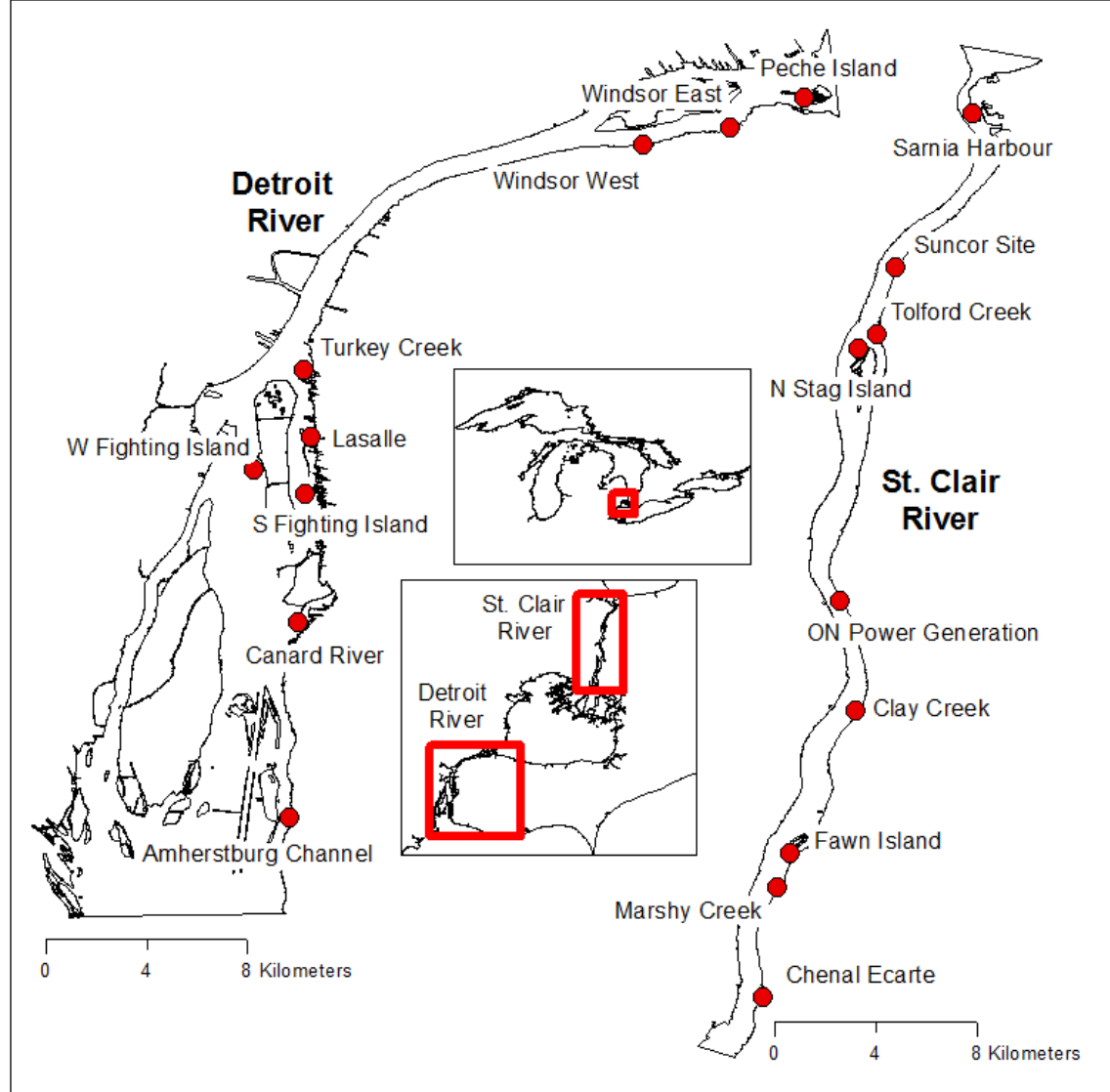
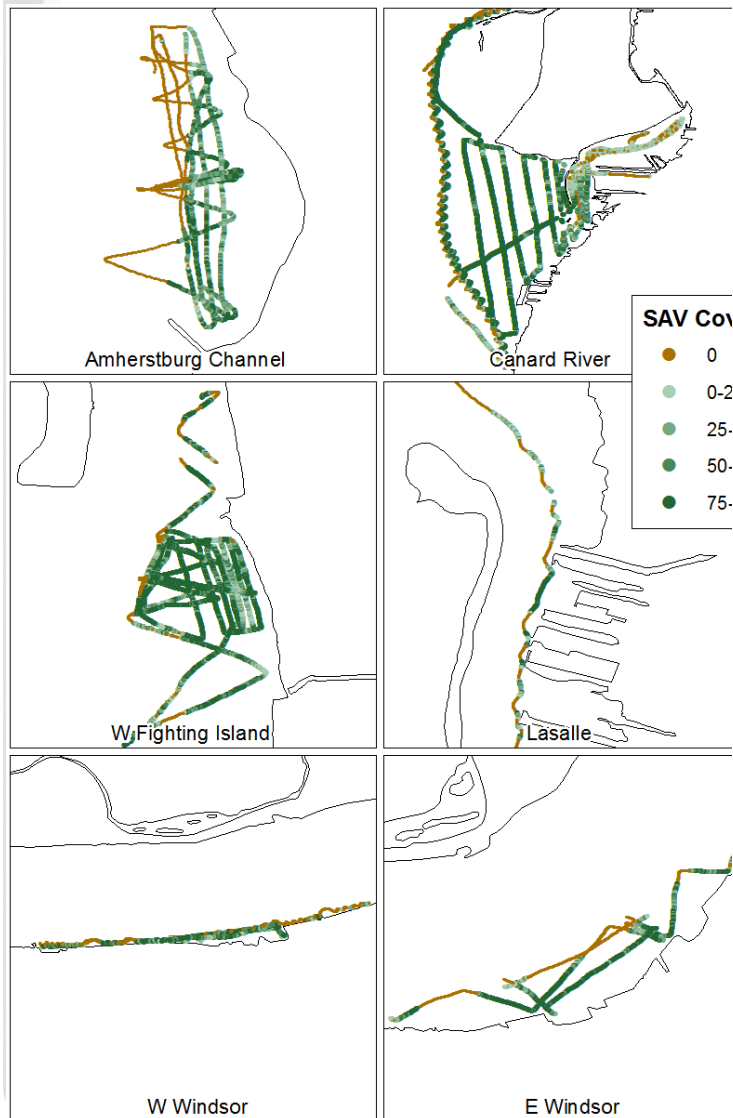
DETAILED DIGITAL ELEVATION MODELS & GAP IDENTIFICATION



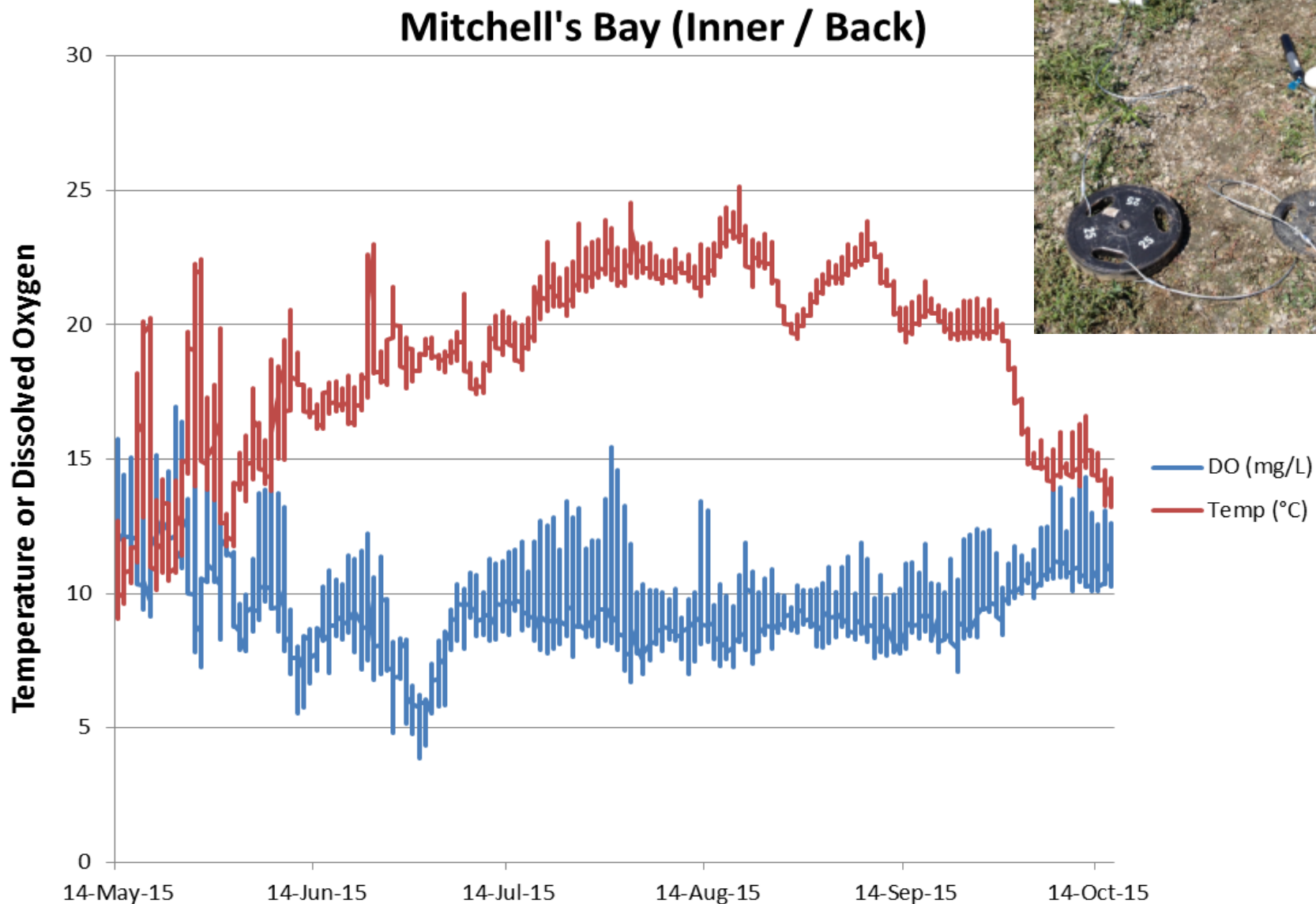
SUBSTRATE DATA COMPILATION



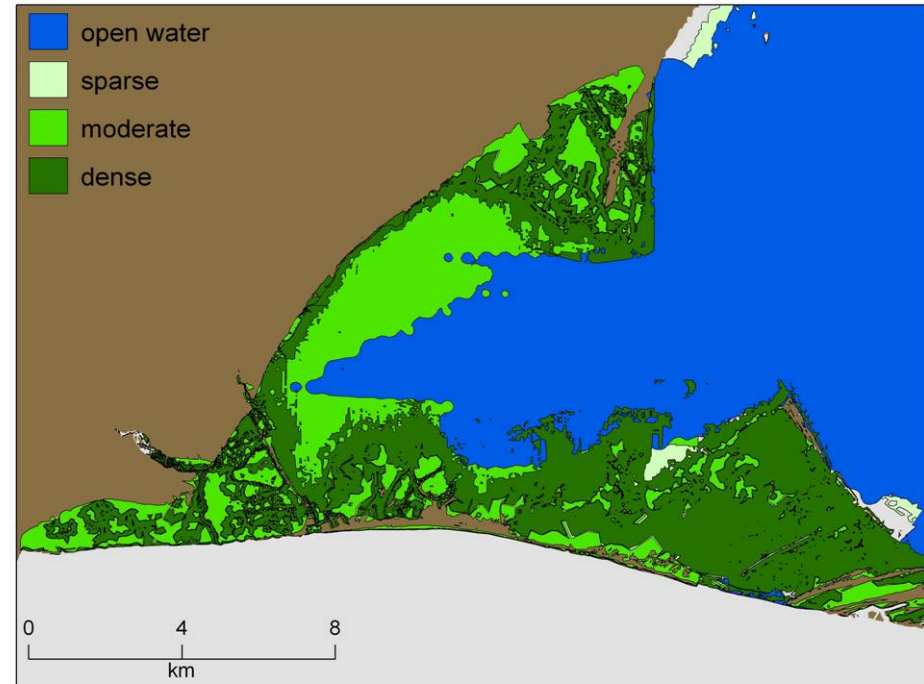
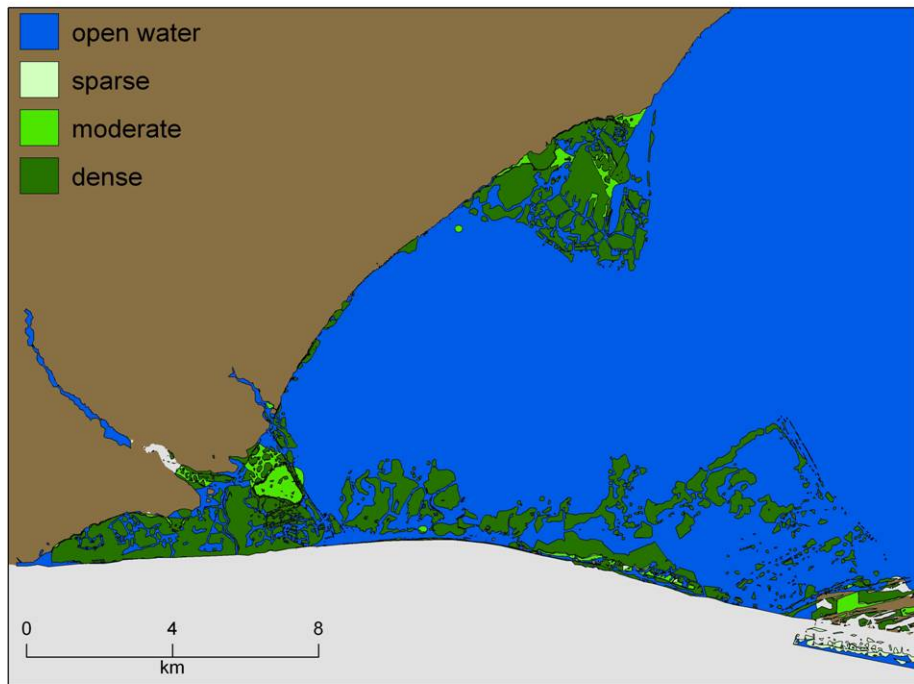
SPATIAL GAP FILLING IN INFLOWING TRIBUTARY MOUTHS



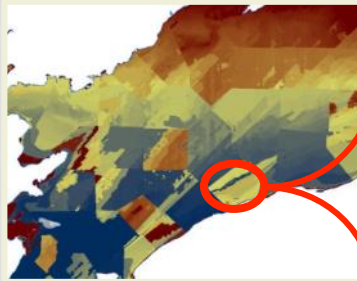
SUMMER – MITCHELL'S BAY



VEGETATION MODELLING



Study Region:



Each unique
habitat patch



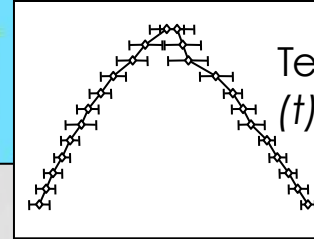
Depth (d)



Substrate (s)



Vegetation (v)



Temperature
(t)

+ Sed &
H₂O Quality

Fish Community:

- Each guild (g) &
- Each life stage (l)



Preference for habitat combo ($d * s * v * t$)
= **Suitability (0-1) – matrix calculation**

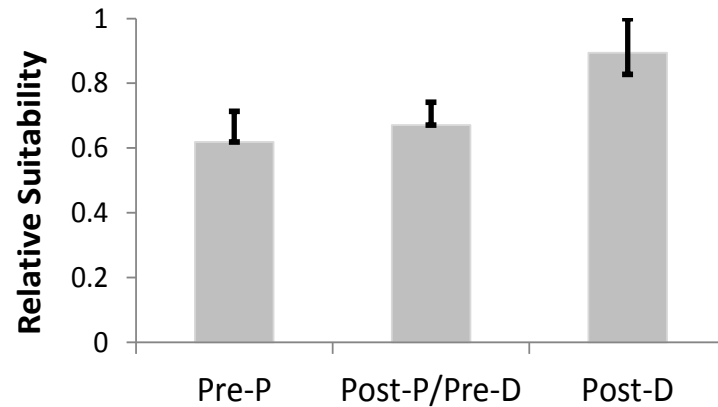
Suitability * patch size (ha)
= **WSA (weighted suitable area)**

Average WSA across g & l
= **Community-wide WSA**

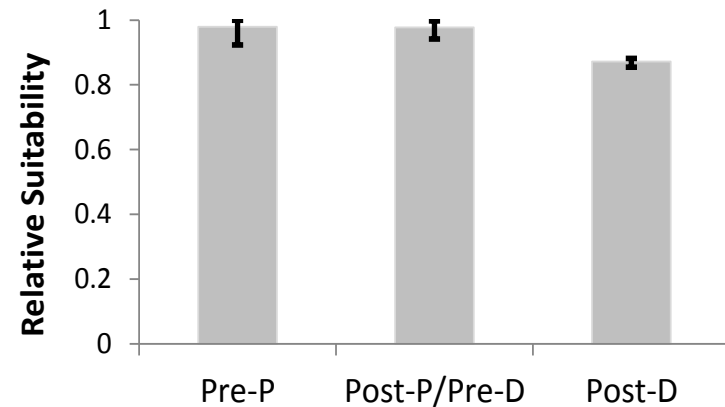
Sum community-wide WSA across
patches & time
= **Study Region WSA + ha-days**

NURSERY HABITAT SUPPLY OVER TIME

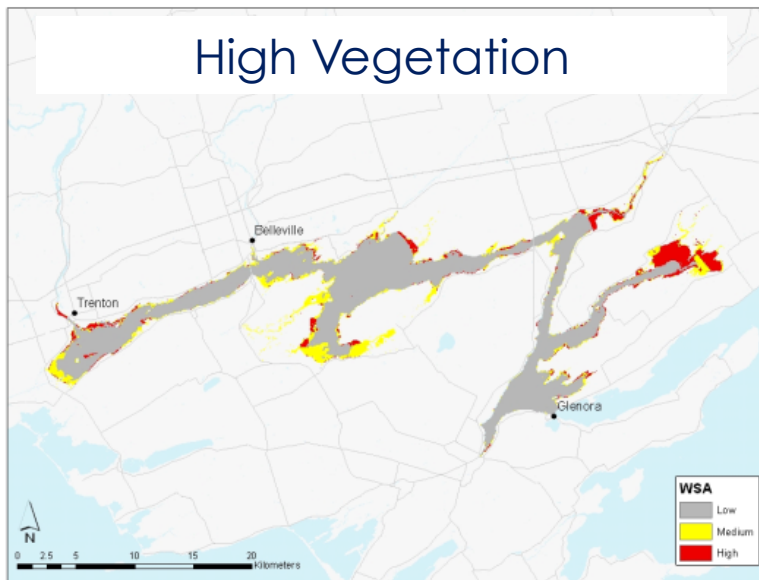
YOY High Vegetation



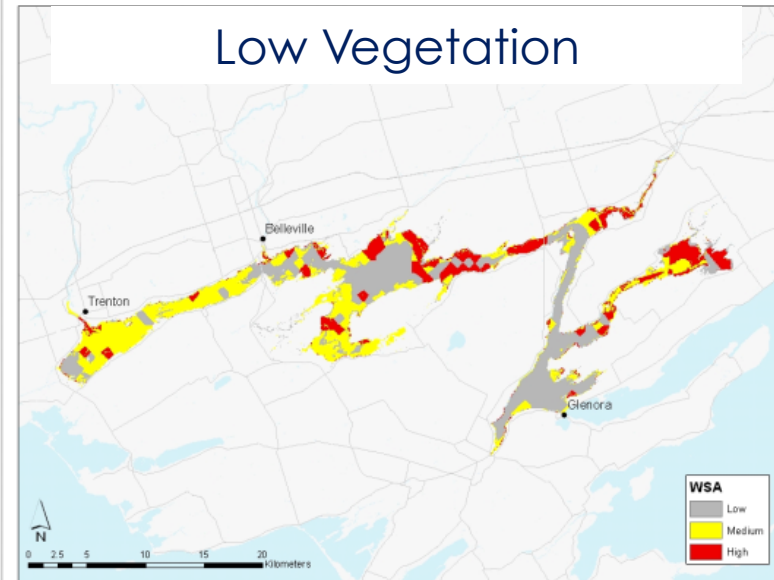
YOY Low Vegetation



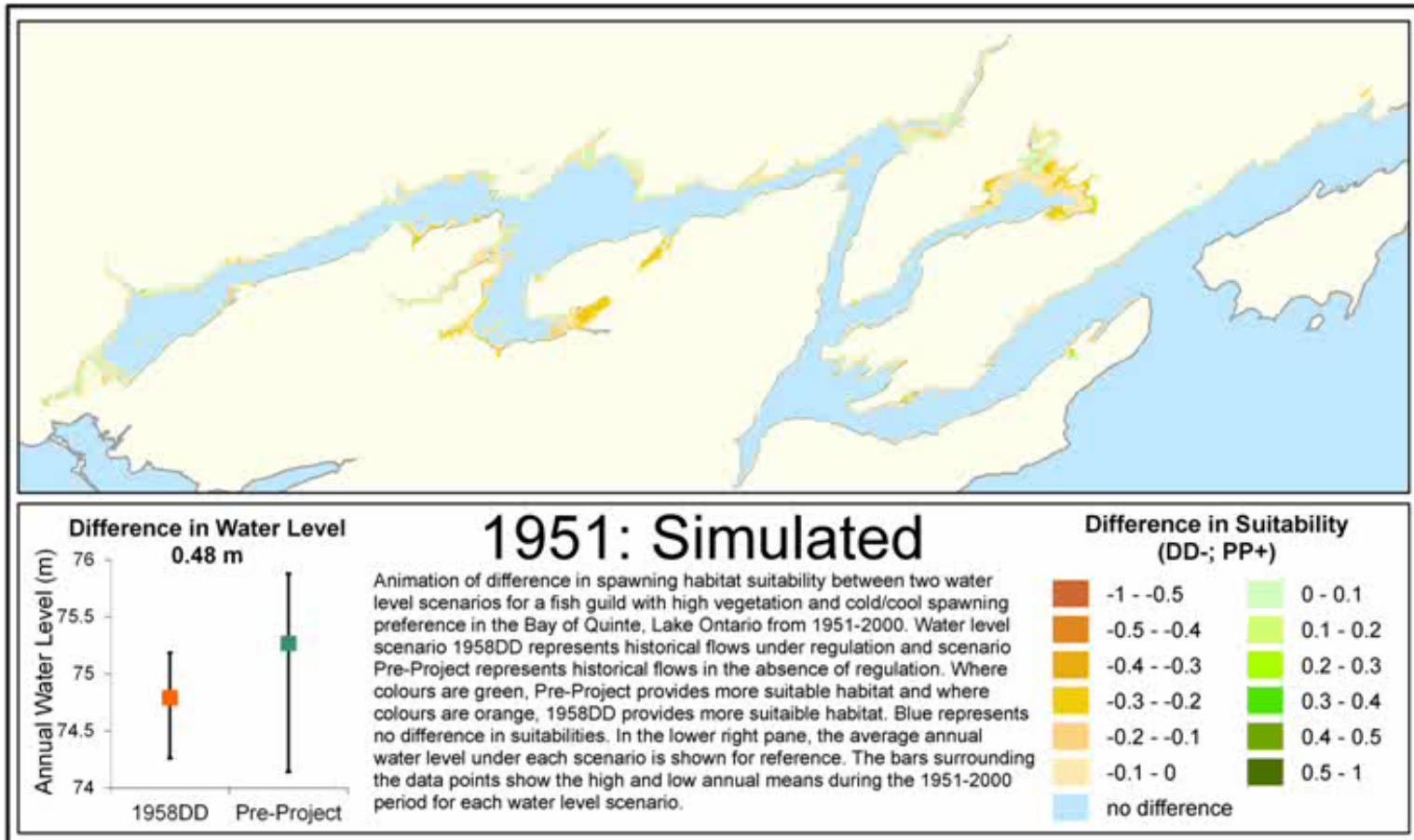
High Vegetation



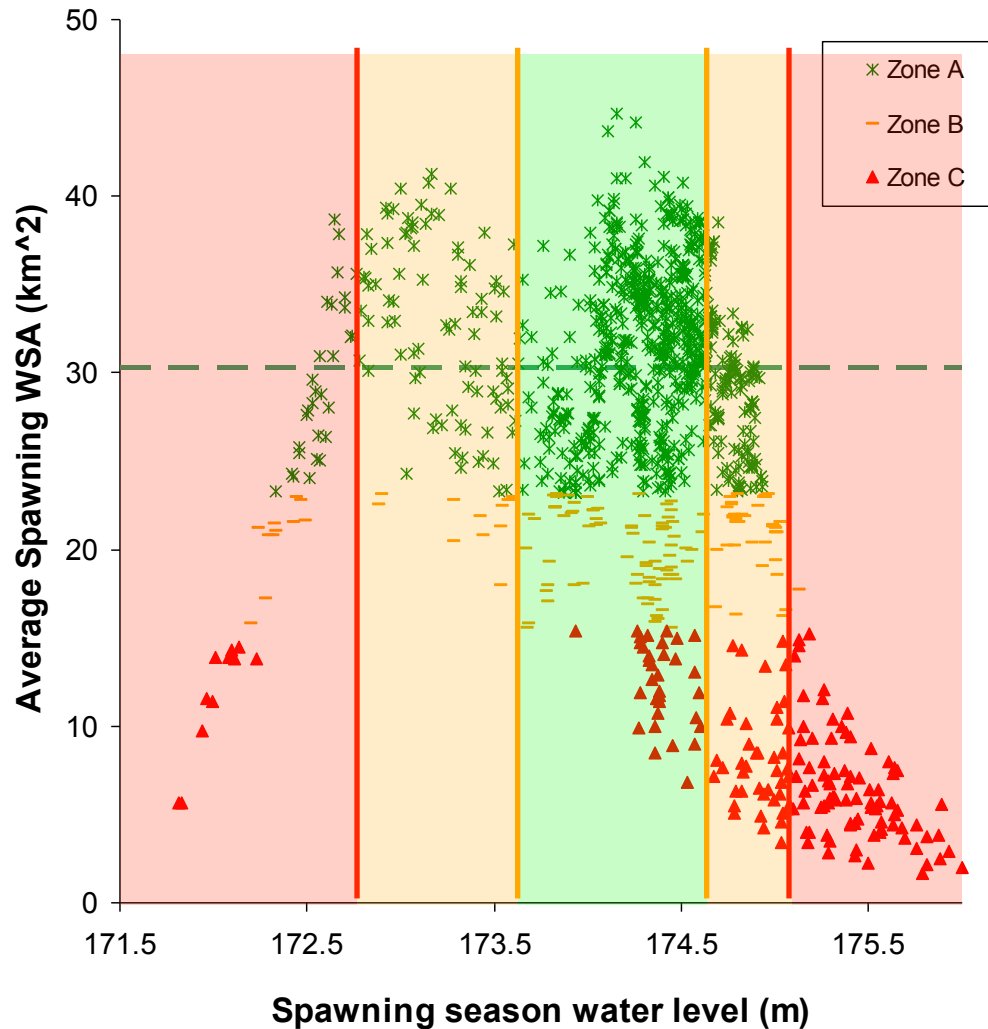
Low Vegetation



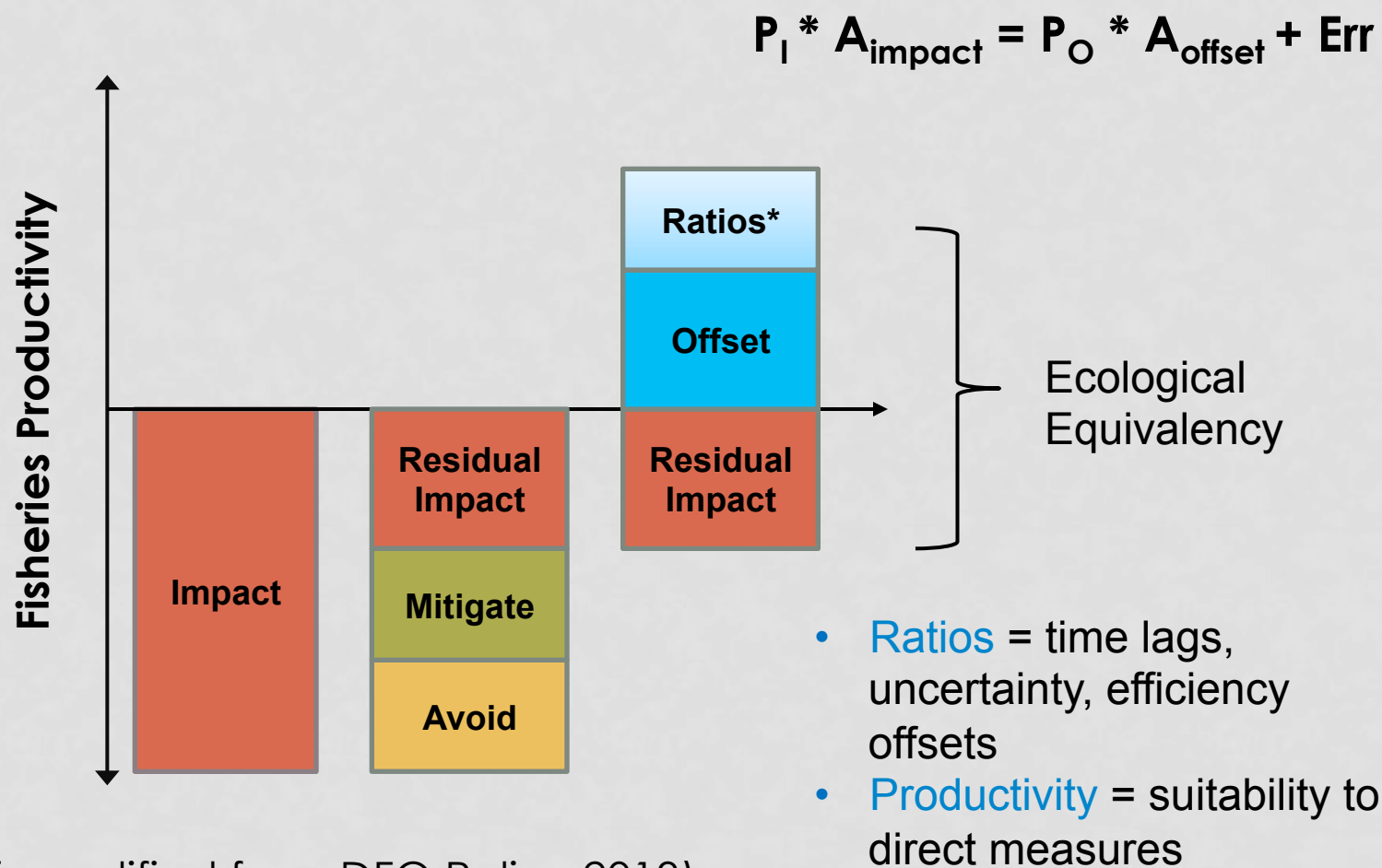
BAY OF QUINTE – DIFFERENCES IN SPAWNING SUITABILITIES UNDER REGULATION



SPAWNING HABITAT AND WATER LEVELS FOR LONG POINT



IMPACT ASSESSMENT & OFFSETTING



(ref: modified from DFO Policy 2013)

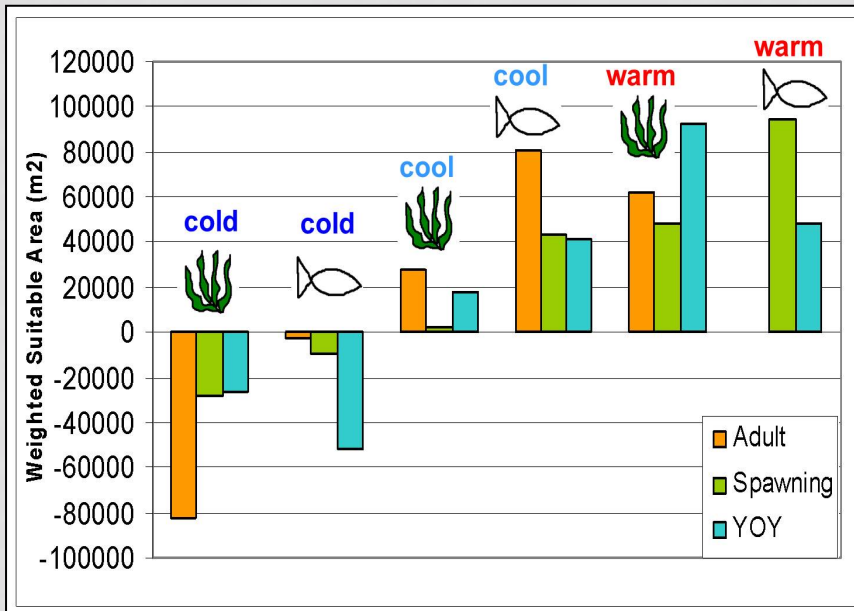
ECOLOGICAL ACCOUNTING FRAMEWORK

- ❖ **5 ecoclasses** proposed within nearshore areas : **Wetland, Rivermouth, Embayment, Open Coast, and Offshore**
- ❖ Each ecoclass naturally has a different level of potential productivity
- ❖ Different fisheries or ongoing productivity index values (**OPIs**) can be assigned to each ecoclass and represent their maximum potential productivity.
- ❖ OPIs allow calculation of productivity equivalents; necessary when trading between ecoclasses.

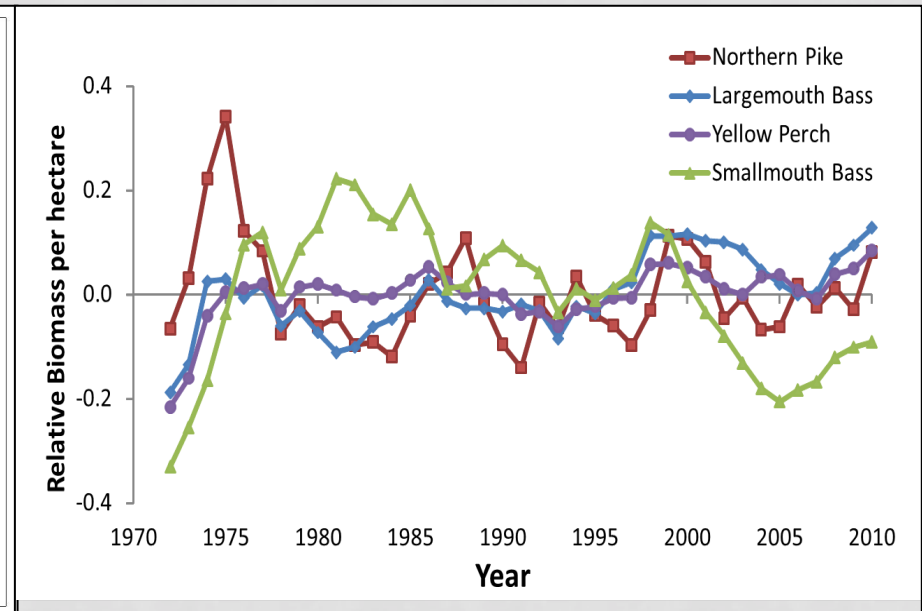


NET GAINS & POPULATION GAMING

- Restoration activity assessment with fish community objectives considered
- Input to population modelling for assessment and trends

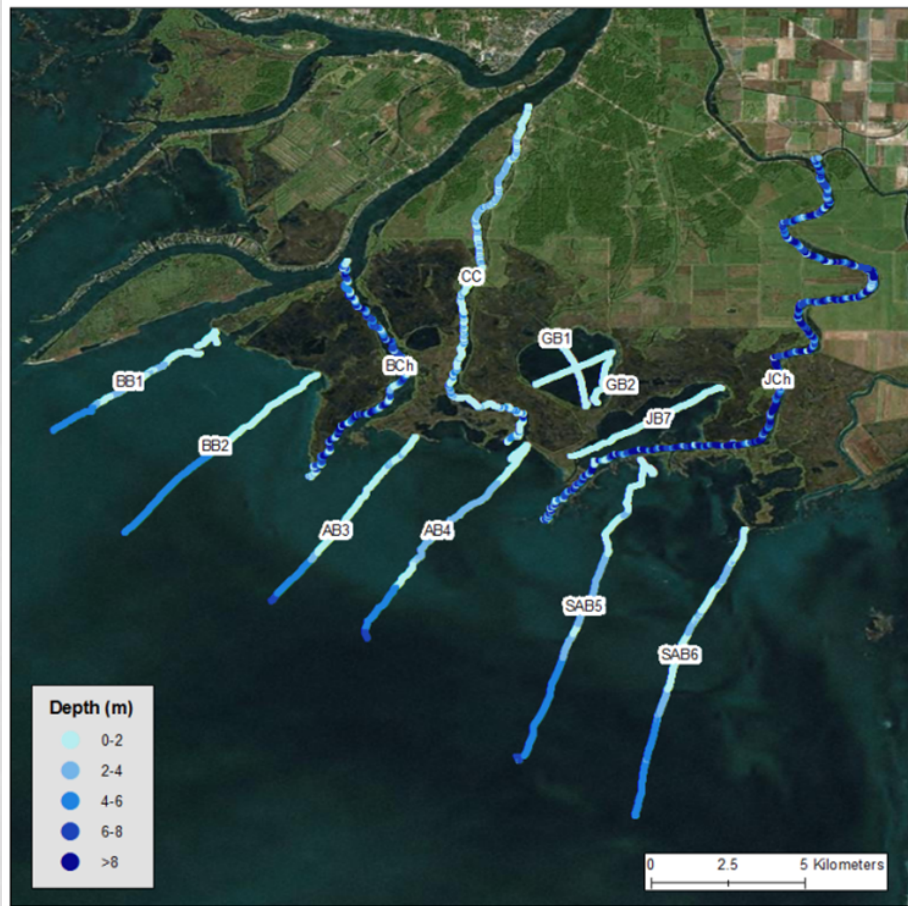


Hasnain et al 2012



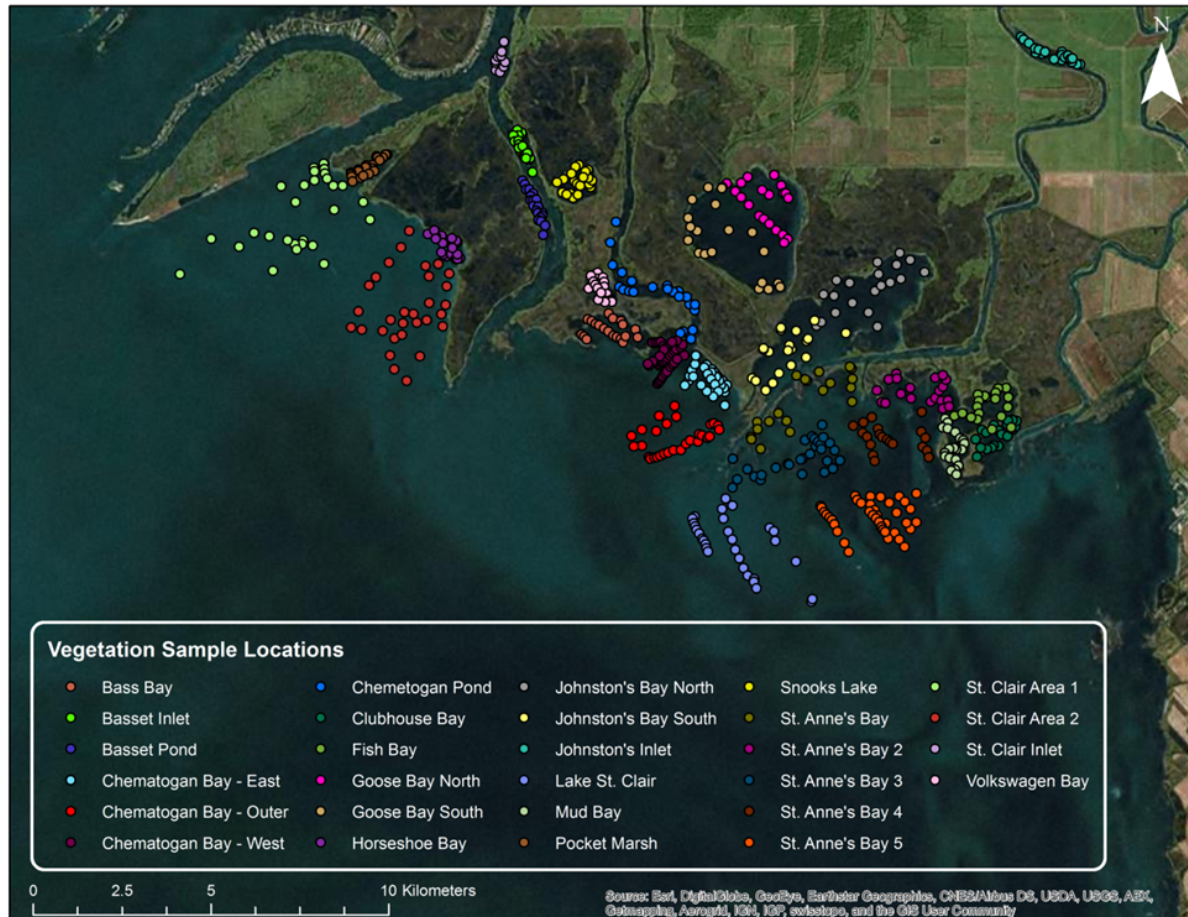
Gertzen et al 2012

DEPTH & VEGETATION TRANSECTS



VEGETATION SAMPLING

– AUG 2015



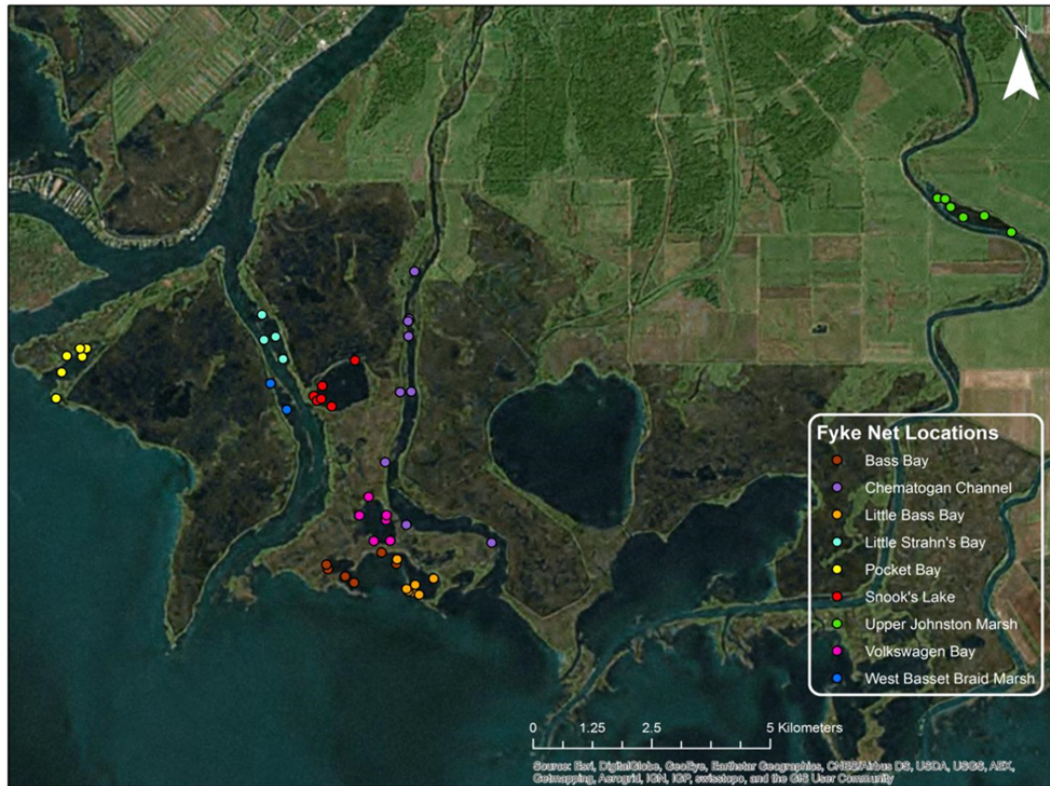
Location	# Species
Fish Bay	31
Mud Bay	29
Clubhouse Bay	25
St. Anne's Bay 2	23
Chematogan Pond	21
St. Anne's Bay	21
Volkswagen Bay	21
Pocket Marsh	20
Goose Bay South	19
Bass Bay	17
Basset Inlet	17
Johnston's Inlet	17
St. Anne's Bay 5	16
St. Anne's Bay 4	15
Chematogan Bay 4	14
Snooks Lake	14
Basset Pond	13
Chematogan Bay 2	12
Johnston's Bay North	12
Johnston's Bay South	12
St. Anne's Bay 3	11
Chematogan Bay	10
Chematogan Bay 3	10
Horseshoe Bay	10
Lake St. Clair	10
St. Anne's Bay 6	10
St. Clair Area 1	8
St. Clair Inlet	8
Goose Bay North	7
St. Clair Area 2	7
Total Species	43

ELECTROFISHING – AUG 2015



Electrofishing Site Diversity	
Location	# Fish Species
Johnston Channel	33
Chematogan Channel	31
Basset Bay	23
Goose Lake	22
Johnston Mouth	22
Clubhouse Bay	19
Johnston Bay	18
Mud Bay	18
Whitney Islands	17
Pocket Bay	14
Chematogan Bay	13
Grassy Islands	13
Fish Bay	11
St. Anne's Bay	9
Horseshoe Bay	5
Total Species	49

FYKE NET SAMPLING – AUG 2015



Fyke Net Diversity	
Location	# Fish Species
Upper Johnston Marsh	25
Bass Bay	22
Chematogan Channel	21
Pocket Bay	20
Snooks Lake	18
Little Bass Bay	17
Volkswagon Bay	14
Little Strahns Bay	9
West Basset Marsh	9
Total Species	38

NEXT STEPS

- **SHORT TERM:** Complete the assessments in St Clair – Detroit River system to achieve habitat research and restoration goals; including quality assessment of Walpole Area – St Clair Delta
- **LONG TERM:** Support Baseline Assessment and Nearshore Framework at larger scales



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ACKNOWLEDGEMENTS

DFO Staff: Susan Doka, Erin Gertzen, Andrew Lewin, Jon Midwood, Kathy Leisti, Dave Reddick, Sarah Laroque, Rex Tang, David McNiece, Jody MacEachern, Andrew Doolittle, Carolyn Bakelaar, Abby Wynia, Sami Kurani, Christine Boston,

WIFN Staff: Clint Jacobs, Kennon Johnson, Naomi Williams + many in field

Data Sources: USGS, NOAA, USACE, ECCC, OMNRF, NRCAN, USF&W, UWindsor, UWaterloo, Long Point Conservation, USEPA,

Funding Sources: Environment & Climate Change Canada's Great Lakes Action Plan (Jon Gee, April White, Sandra Kok); Fisheries & Oceans Science & Fisheries Protection Program; IJC Upper Lakes Water Levels Study



This project was undertaken with the financial support of:
Ce projet a été réalisé avec l'appui financier de :



Environment and
Climate Change Canada

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Changement climatique Canada