



# A Guide to Integrate Plant Cover Data from Two Different Methods: POINT INTERCEPT AND OCULAR COVER

## PROJECT GOAL

Integration of data from two common methods estimating marsh plant cover: Point-intercept & Ocular cover

## PROJECT TEAM

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## OVERVIEW

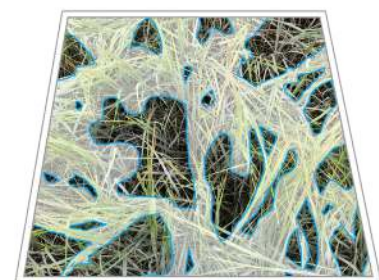
When it comes to monitoring plant cover in tidal marshes, there is a lack of consensus on how. Multiple methods exist to estimate plant cover, which can confound interpretation when making comparisons across methods. Here, we provide a novel and accurate approach to integrate the two most common methods:

### PI Point Intercept



Presence/absence of cover categories using a thin pin in a gridded fixed area: 50 points in a 1m<sup>2</sup> plot.

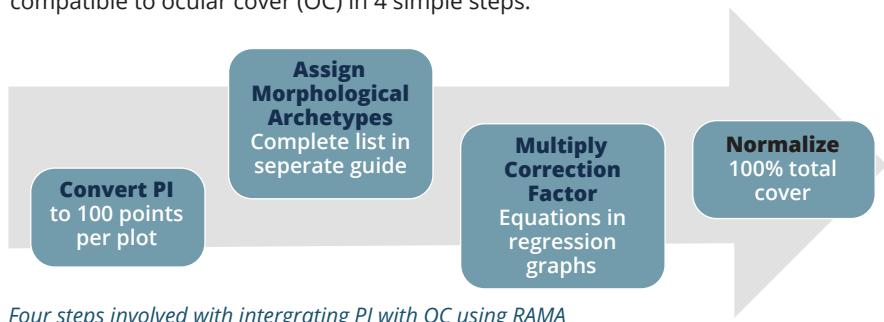
### OC Ocular Cover



Visual estimates of abundance for cover categories in a fixed area: non-binned estimates totaling to 100% in a 1m<sup>2</sup> plot.

## METHOD

Our project team assessed over 100 salt marsh vegetation plots throughout New England located in four National Estuarine Research Reserves using both methods. From this monitoring, we developed a statistical relationship between them using a series of **Regressions Across Morphological Archetypes (RAMA)**. See figure and table below for details on regressions and archetypes. Our results provide a new method to convert point intercept (PI) data into a format more compatible to ocular cover (OC) in 4 simple steps:

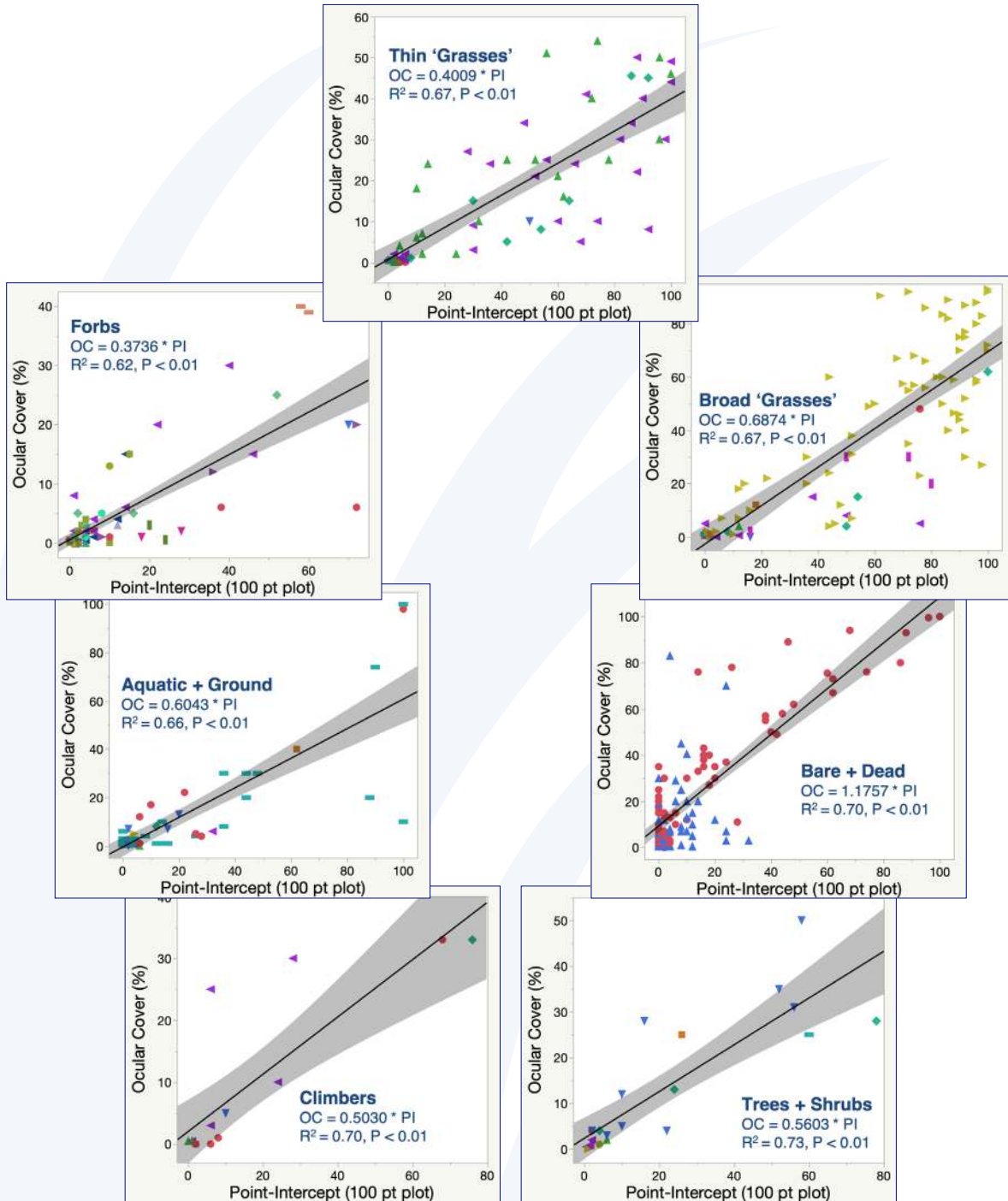


Four steps involved with intergrating PI with OC using RAMA



## TRANSFORMATIONS OF PI $\rightarrow$ OC

Transformations were most similar when using linear regressions across morphological archetypes (groupings of abiotic cover and plant species similar in structure). To transform, use a correction factor (provided as the **slope in the figures**) from the appropriate morphological archetype. For a full list of each morphological archetype, see page 3. Full details on page 2.

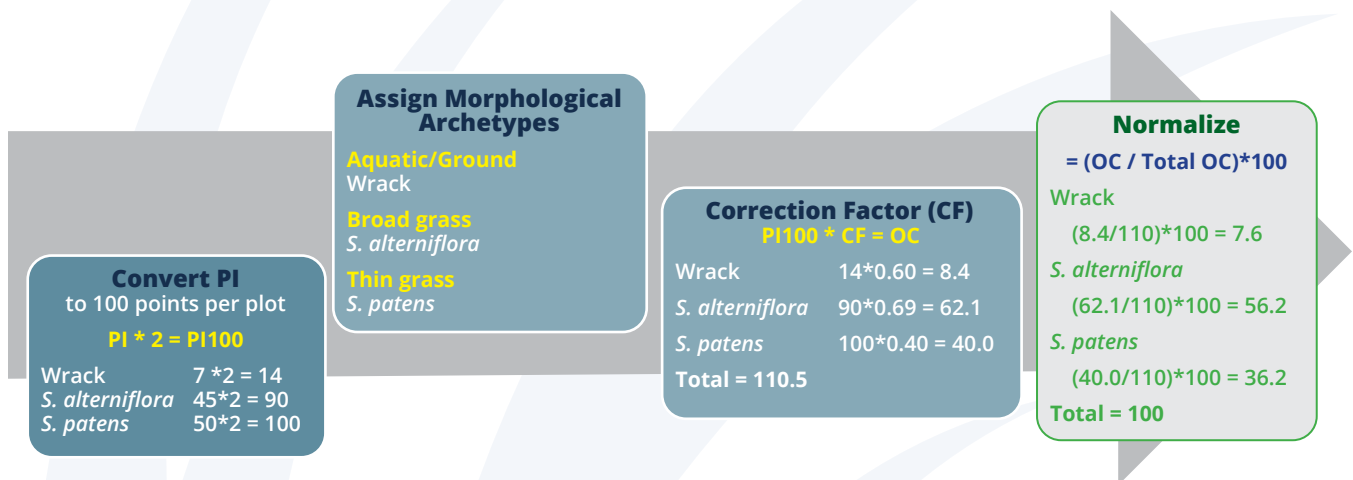
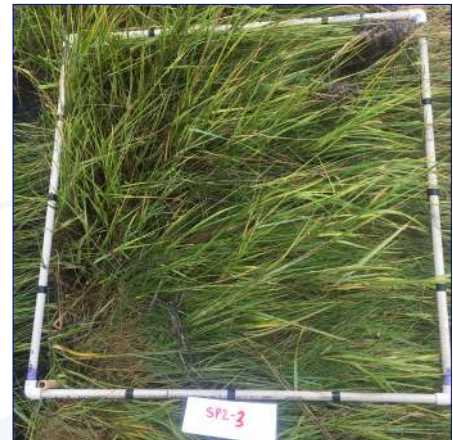


Notes: Regressions were created using a linear model (shown). Correction factors are derived from the slope of a regression constrained to zero (not shown). Graph symbols represent different plant species or abiotic cover categories.

## PLOT EXAMPLE

Using data from one of our plots monitored with both PI and OC (Great Bay SP3-3), we illustrate how to transform the data. The below table shows PI raw values (50-point plot, 1m<sup>2</sup>) being transformed using a couple of steps to become more compatible to OC data. See figure below for details, including equations

	Point -Intercept				Ocular
	Raw data	to 100 pts	Apply Cor. Factor (CF)	Normalize to 100%	Cover (field)
Wrack	7	14	8.4	7.6	10
<i>S. alterniflora</i>	45	90	62.1	56.2	50
<i>S. patens</i>	50	100	40.0	36.2	40
Total	102	204	110.5	100.0	100



Example data shown above is from a 50-point plot in a 1m<sup>2</sup> quadrat.

## SUMMARY

We provide an easy process for transforming point-intercept data to be more compatible with ocular cover data:

### Regressions Across Morphological Archetypes (RAMA).

This transformation method was compared with traditional methods and provided the most statistically similar data to OC. Transformed data, however, remains less accurate than data collected with a single method due to inherent differences between the protocols. For instance, we found greater dissimilarity between transformed PI and OC in the Bare + Dead archetype. This is likely the result of the PI method only counting bare or dead cover when the pin does not 'hit' any live cover categories, whereas OC weights all covers equally. As such, we recommend utilizing a single protocol when possible. This work is from a larger project funded by the National Science Collaborative. For a full list of project participants who help create this guide, see Burdick et al. 2020.

## REFERENCES

Burdick, D.M., C.R. Peter, C. Feurt, B. Fischella, M. Tyrrell, J. Allen, J. Goldstein, K. Raposa, J. Mora, L. Crane. 2020. Synthesizing NERR Sentinel Site data to improve coastal wetland management across New England. Final Report to National Science Collaborative.  
[www.nerrsciencecollaborative.org/project/Burdick18](http://www.nerrsciencecollaborative.org/project/Burdick18)

Morphological Archetypes	Cover
Bare/Dead	Bare Ground
Bare/Dead	Dead
Ground / Algae	Algae
Ground / Algae	Ascophyllum nodosum
Ground / Algae	Fucus spp
Ground / Algae	Fucus vesiculosus
Ground / Algae	Gracilaria sp.
Ground / Algae	Moss
Ground / Algae	Ruppia maritima
Ground / Algae	Ulva Lactuca
Ground / Algae	Wrack
Forbs	Atriplex patula
Forbs	Galium palustre
Forbs	Impatiens capensis
Forbs	Iris versicolor
Forbs	Lepidium virginicum
Forbs	Limonium nashii
Forbs	Mentha arvensis
Forbs	Oenothera biennis
Forbs	Onoclea sensibilis
Forbs	Osmunda cinnamomea
Forbs	Plantago spp
Forbs	Polygonum ramosissimum
Forbs	Salicornia depressa
Forbs	Salicornia maritima
Forbs	Salicornia spp
Forbs	Solidago sempervirens
Forbs	Spergularia marina
Forbs	Suaeda linearis
Forbs	Sueda maritima
Forbs	Symphyotrichum novi-belgii
Forbs	Symphyotrichum spp.
Forbs	Symphyotrichum subulatas
Forbs	Teucrium canadense
Forbs	Thalictrum dioicum
Forbs	Thalictrum polygamum
Forbs	Trientalis borealis

Morphological Archetypes	Cover
Broad 'Grasses'	Agropyron pungens
Broad 'Grasses'	Ammophila breviligulata
Broad 'Grasses'	Carex spp.
Broad 'Grasses'	Phragmites australis
Broad 'Grasses'	Phragmites australis var. americanus
Broad 'Grasses'	Schoenoplectus maritimus
Broad 'Grasses'	Schoenoplectus robustus
Broad 'Grasses'	Spartina alterniflora
Broad 'Grasses'	Spartina pectinata
Broad 'Grasses'	Typha angustifolia
Thin' Grasses'	Agrostis stolonifera
Thin' Grasses'	Distichlis spicata
Thin' Grasses'	Festuca rubra
Thin' Grasses'	Juncus balticus
Thin' Grasses'	Juncus gerardii
Thin' Grasses'	Spartina patens
Climbers	Calystegia sepium
Climbers	Cuscuta gronovii
Climbers	Cuscuta spp.
Climbers	Parthenocissus quinquefolia
Climbers	Smilax spp.
Climbers	Solanum dulcamara
Climbers	Toxicodendron radicans
Shrubs & Trees	Acer rubrum
Shrubs & Trees	Alnus spp
Shrubs & Trees	Baccharis halimifolia
Shrubs & Trees	Iva frutescens
Shrubs & Trees	Juniperus virginiana
Shrubs & Trees	Myrica pensylvanica
Shrubs & Trees	Myrica spp
Shrubs & Trees	Picea spp
Shrubs & Trees	Prunus maritima
Shrubs & Trees	Quercus rubra
Shrubs & Trees	Rosa multiflora
Shrubs & Trees	Rosa rugosa
Shrubs & Trees	Spiraea tomentosa

Full abiotic cover and plant species list grouped by morphological archetype.