MID ATLANTIC COASTAL WETLAND ASSESSMENT UPDATE

Tidal Rapid Assessments 2014: Mullica and Dennis

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ORIENTATION MidTRAM

The Mid Atlantic Tidal Rapid Assessment Method (MidTRAM) seeks to determine the condition or level of stress at representativ4e sample locations withing emergent coastal wetlands MidTRAM protocol serves as ground-truthing (Tier 2 of the Mid Atlantic Wetland Assessment Program) of remotely censed wetlands data (Tier 1). Typically, at least 30 points randomly generated points are assessed for each HUC12 to summarize watershed-level conditions. To date, 10 watersheds, 3 of which were fresh water marshes, have been completed in the Mid-Atlantic region by PDE, DNREC and the Barnegat Bay Partnership (BBP)(Figure 4); more information can be found in the Mid-Atlantic Coastal Wetlands Assessment 2014 Annual Report (PDE 2014).

MidTRAM sampling points consist of 50 m² assessment areas, using hydrological, habitat, buffer/ landscape, and shoreline attributes. These attributes are composed of several metrics which are averaged to compute a final score. The distribution of these final scores can be used to categorize assessment areas as minimally, moderately, or severely stressed.

METHODS

Thirty (Dennis) and fifteen (Mullica) randomly generated points were assessed within each watershed in the summer of 2014. Field data collection began by laying out two perpendicular 100 meter transects, which comprised the assessment area (AA). Metrics were measured at the intersection of these transects (salinity, soil organic layer depth); bearing capacity was assessed at eight locations, four at 25 m and four at 50 m from the AA center. Vegetation obstruction was measured at four locations 25 m from the AA center. Then, observations on plant community composition and landscape condition (with in a 250 buffer area around the AA) were taken. Desktop analysis included measuring distances to structures that would inhabit landward migration. Attributes and metrics used to compute final scores are summarized in Table 1. For more on methodologies, see MidTRAM version 3.0 (DNREC 2010).

| Attribute	Metric	Description
QDR	Qualitative Disturbance Rating	Score of 1 - 6 assigned to the site using best professional judgement of overall condition
Buffer Score	Percent of AA with 5 m Buffer	Percent of AA perimeter that has at least 5 m of natural or semi-natural condition land cover
	Average Buffer Width	The average buffer width surrounding the AA that is in natural of semi-natural condition
	Surrounding Development	Percent of developed land within 350 m from the edge of the AA
	250 m Landscape Condition	Landscape condition within 250 m buffer based on the nativeness of vegetation, disturbance to substrate and extent of human visitation
	Barriers to Landward Migration	Percent of landward perimeter of wetland within the 250 m buffer that has physical barriers preventing wetland migration
Hydrology Score	Ditching and Draining	The presence of ditches in the AA
	Fill and Fragmentation	The presence of fill or wetland fragmentation from anthropogenic sources in the AA
	Diking and Tidal Restrictions	The presence of dikes or other tidal flow restrictions
	Point Sources	The presence of localized sources of pollution
Habitat Score	Bearing Capacity	Soil resistance using a slide hammer
	Vegetative Obstruction	Visual obstruction by vegetation < 1 m measured with a cover board
	Number of Plant Layers	Number of plant layers based on plant height
	% Co-Dominant Invasive Species	Percent of co-dominant invasives species in AA
	% Invasive Cover	Percent cover of invasive species in the AA
Shoreline Score	Shoreline Erosion	Shoreline condition at shoreline transect points based on the erosion:accretion ratio
	Shoreline Alteration	Presence of built structures or non-natural materials along the shorelines at transect points

RESULTS

MULLICA
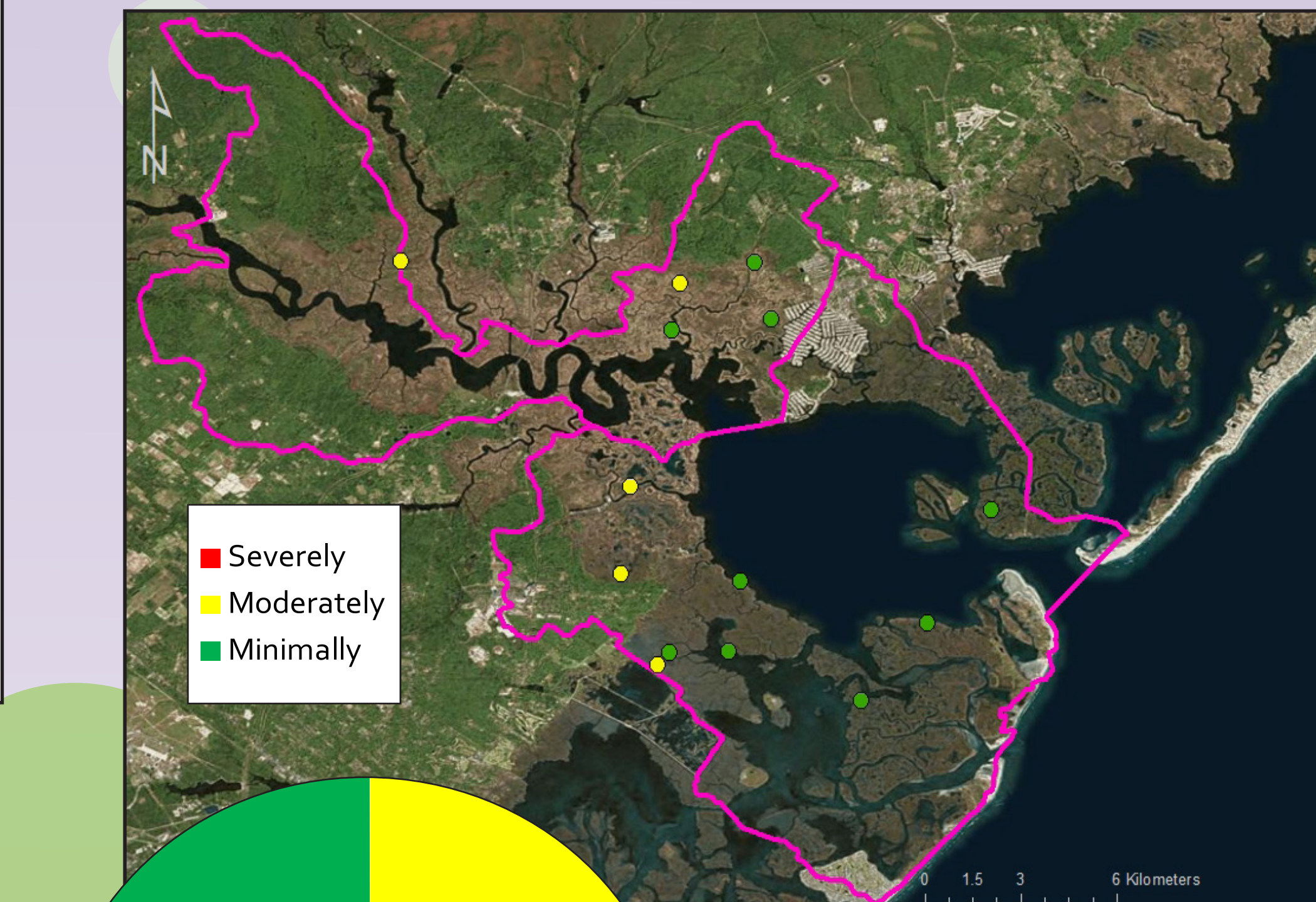
Figure 1. Assessment points in the Mullica River watershed, color coded by final score level of stress.
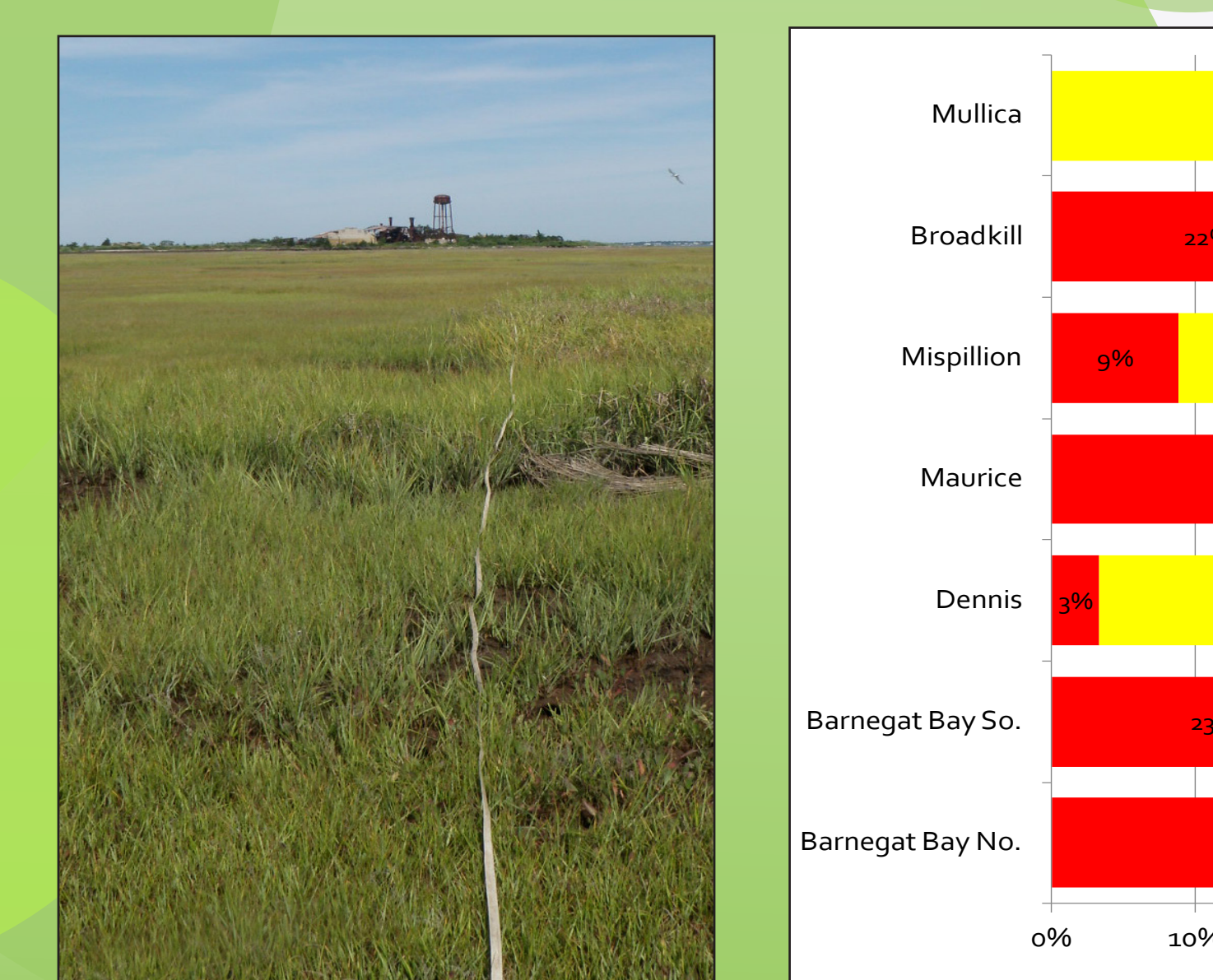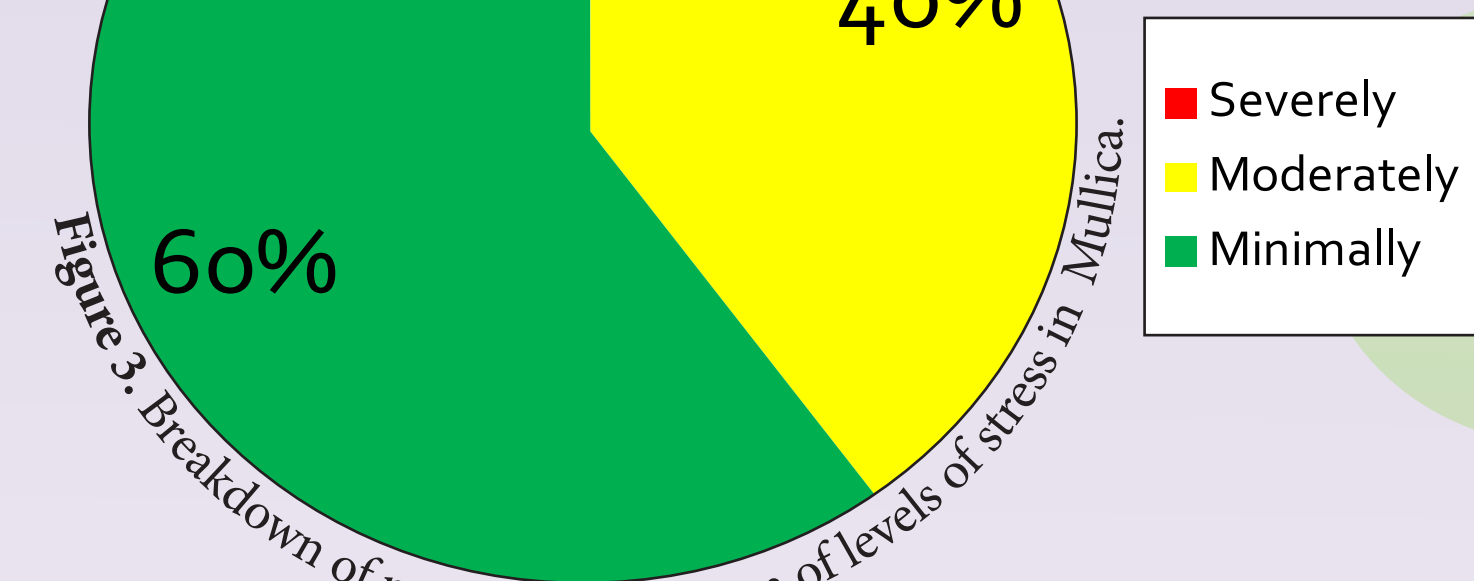

Figure 3. Breakdown of percent distribution of levels of stress in Mullica.
60% / 40%

Severely / Moderately / Minimally

DENNIS

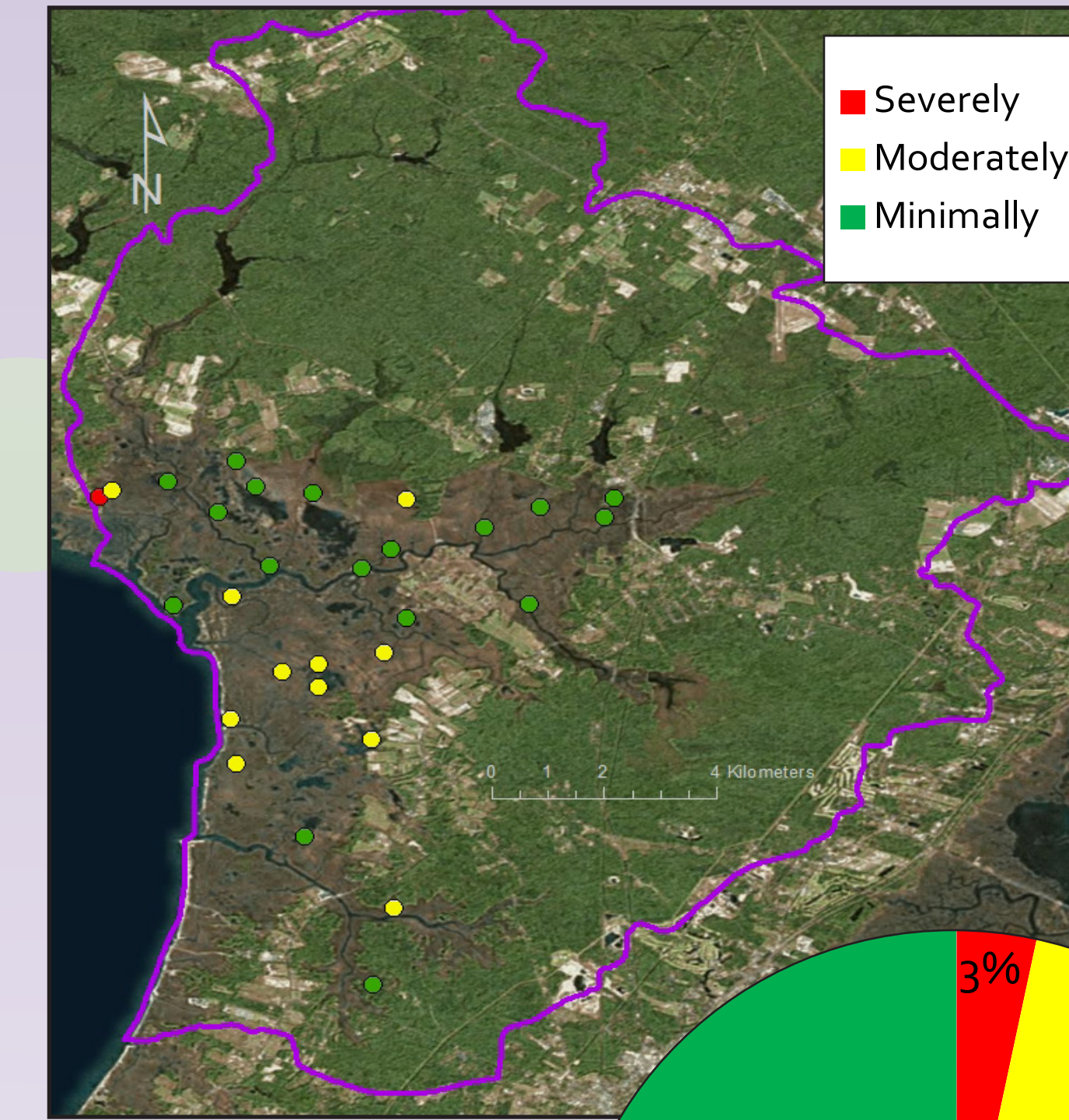

Figure 2. Assessment points in the Dennis Creek watershed, color coded by final score level of stress.

Figure 5. Breakdown of percent distribution of levels of stress in Dennis.
57% / 40% / 3%

Severely / Moderately / Minimally

Figure 4. MidTRAM HUC12s (pink) completed as of 2014 in New Jersey, Delaware, and Pennsylvania. Tidal marshes (fresh or saline) are filled in green.

Figure 6. Testing salinity in the Mullica River watershed, just north of Atlantic City, NJ.

Figure 7. Performing MidTRAM in a cedar snag forest marsh in Dennis Creek, NJ.
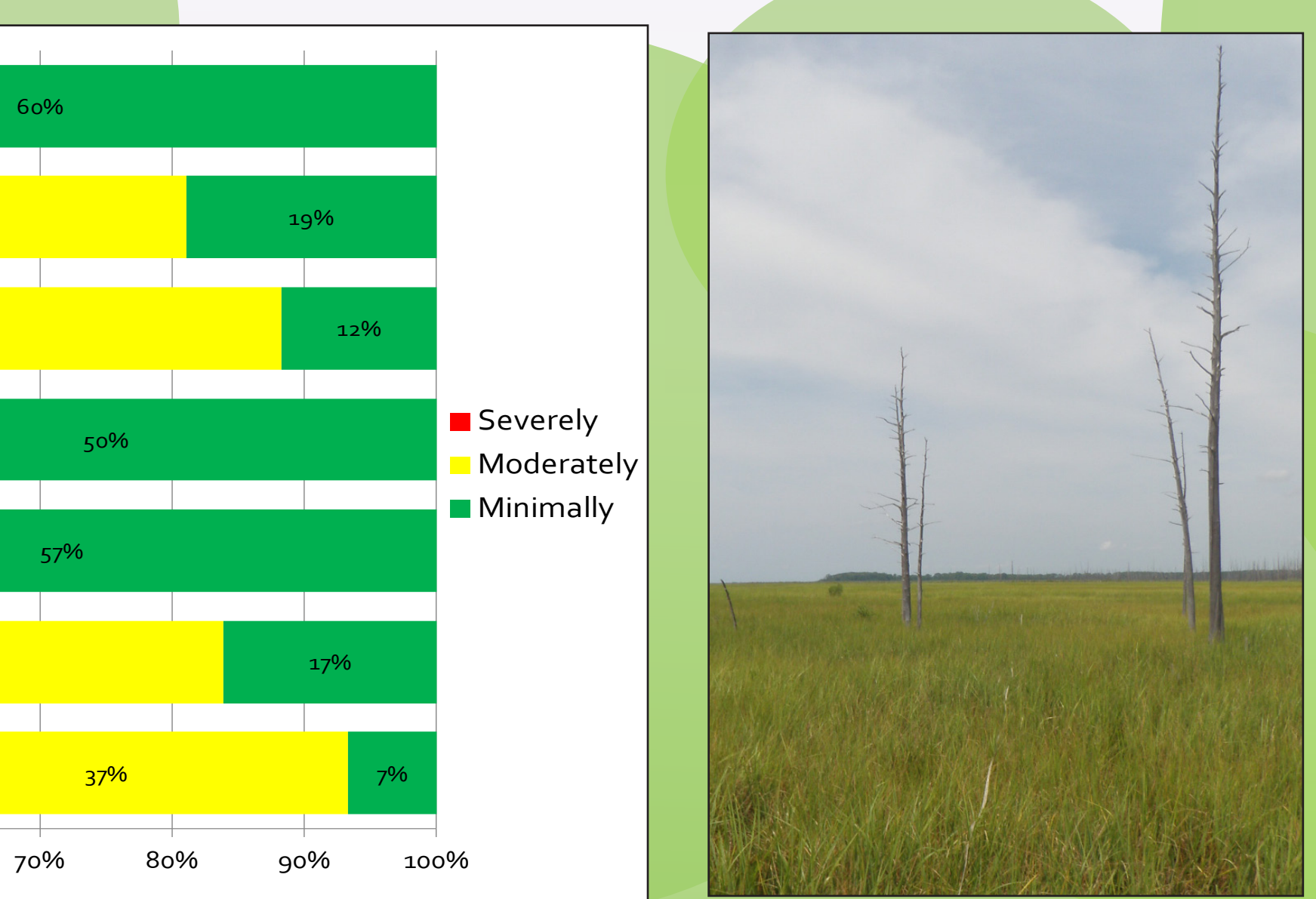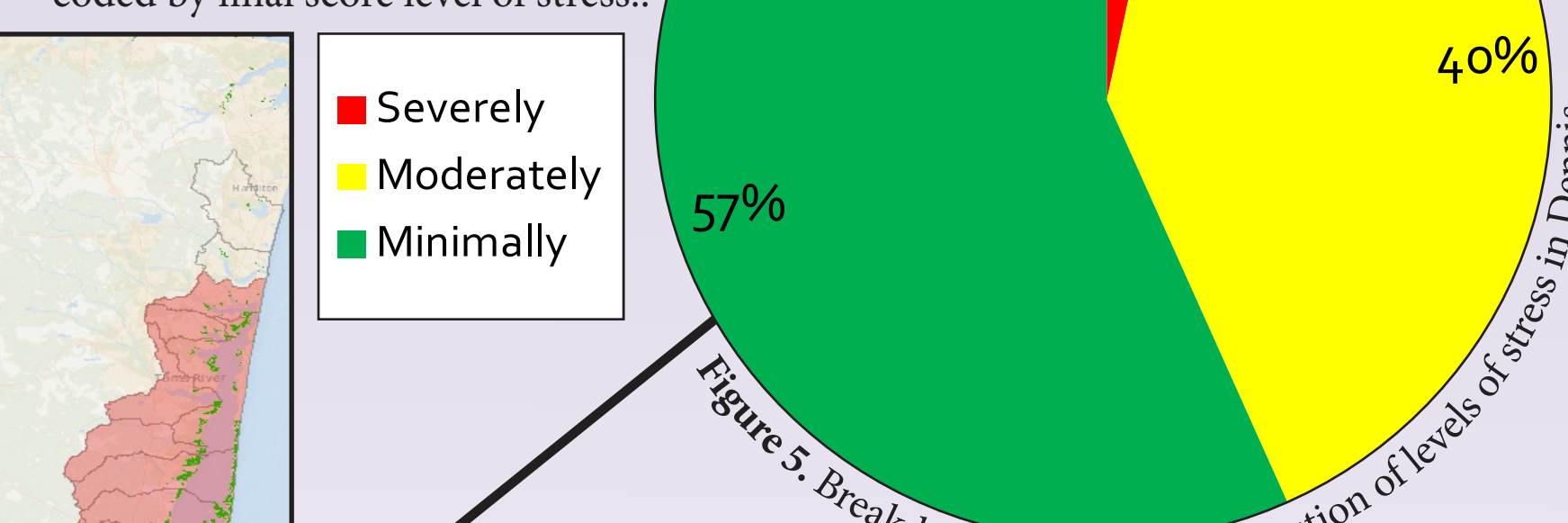

Figure 8. Westward transect on the Great Bay in the Mullica watershed.

Figure 9. Comparison of stress level breakdowns among salt marshes assessed with MidTRAM by PDE, BBP, and DNREC since 2011.

	Severely	Moderately	Minimally
Mullica		40%	60%
Broadkill	22%	59%	19%
Mispillion	3%	79%	12%
Maurice	20%	20%	50%
Dennis	3%	40%	57%
Barnegat Bay So.	23%	63%	17%
Barnegat Bay No.	17%	37%	7%

Figure 10. Westward transect on a northern tributary of Dennis Creek.

SUMMARY

- In 2014, 30 points were assessed for condition using MidTRAM protocols in the Dennis Creek (Figures 2, 5, 7, & 10) watershed and 15 were assessed in the Mullica River watershed (Figures1, 3, 6, & 8).

- MidTRAM analysis categorized final scores as indicating severely stressed (scores 0-66), moderately stressed (67-81.4), or minimally stressed (81.5-100) wetlands. Average final scores for Dennis and Mullica were 81.04 and 81.85, respectively. We conclude that on average Dennis is moderately stressed and Mullica is minimally stressed. Sixty percent of points assessed in Mullica were of minimally stressed, and none were severely stressed (Figures 1 & 3). In Dennis, 57% were minimally stressed and only one point (3%) was severely stressed (Figure 2 & 5).

- Mullica and Dennis both scored better than other salt marshes assessed with MidTRAM (Figure 9); the next highest score was Maurice (76.06).

FUTURE STEPS & IMPLICATIONS

- Conducting MidTRAM assessments is an on going process; only 1-2 watersheds can be assessed per year at our current capacity. Our ultimate goal is to assess all watersheds within the Mid Atlantic and to repeat every 10 years in order to provide extensive condition information.

- **MidTRAM provides spatially explicit information on the condition of tidal wetlands and also identifies specific stressors that are more problematic in certain watersheds.** The understanding of these stressors is fundamental to predicting the long term resilience of tidal marsh systems and addressing stressors through management.

- In conjunction with other studies conducted through the MACWA, such as Site Specific Intensive Studies, condition information obtained through MidTRAM offers improved spatial resolution and allows managers or researchers to apply or extrapolate certain information across broader tracts of marsh. **MidTRAM data therefore help to guide preservation, conservation, and management.**

- Data provided by MidTRAM assessments are also being used to to guide and monitor restoration efforts (e.g. Marsh Futures).

WORKS CITED

DNREC. 2010. Mid-Atlantic Tidal Wetland Rapid Assessment Method version 3.0. < http://www.dnrec.delaware.gov/Admin/DelawareWetlands/Documents/Tidal%20Rapid_Protocol%203.0%20Jun10.pdf>

Partnership for the Delaware Estuary. 2014. Mid-Atlantic Coastal Wetlands Assessment - 2014 Annual Report. RPDE Report No. 14-01. 66 p. www.DelawareEstuary.org/ScienceReports

ACKNOWLEDGEMENTS