

LDEO Meeting Consensus Statement
concerning the
Draft Piermont Marsh Reserve Management Plan
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This statement arose out of discussion of the December 2017 New York State Department of Environmental Conservation Draft Piermont Marsh Reserve Management Plan:

<http://www.dec.ny.gov/lands/92365.html>

We agree that Piermont Marsh has value in storm protection, native plant communities, increased bird nesting sites, and resiliency monitoring. The issues we raise here are substantially the same as those we have raised in a variety of forums with DEC and PIPC scientists over the past four years, both in town meetings at LDEO since 2013.

Our concerns are as follows:

1) **Glyphosate was defined by the World Health Organization in 2015 as a known carcinogen, and should not be used.** The proposed 40-acre mowing and spraying with **glyphosate** (in **Aqua-Pro**) to increase plant diversity has major risks and recent discoveries show that it is **accumulating in the environment with chronic low dose effects on animals and humans documented**, as well as **shifts in microbial and fungal communities**, and is a possible **driver for antibiotic resistance** (van Brugen et al., 2018).

2) ***Phragmites* would continue to re-colonize**, and herbicide and/or mowing would have to be applied **each year in perpetuity at a prohibitive cost.** The Lower Hudson Valley region is so heavily invaded by *Phragmites* that **seed source** is prevalent and extremely viable due to high level of **genetic diversity in the Hudson Valley** (Stabile et al., 2016). A recent paper evaluating *Phragmites* management nationwide from 2005-2009 found that organizations spent >\$4.6 million per year on *P. australis* management, and that 94 % used herbicide to treat a total area of ~80,000 ha. **Despite these high expenditures, few organizations accomplished their management objectives** (Martin and Blossey, 2013).

3) **Treatment separating the northern and southern areas of the marsh could result in an elevation decline**, which might allow **water to erode the marsh interior**. Several studies have shown elevation decline with *Phragmites* removal (i.e., Hagen et al. (2007)); students participating in the LDEO Secondary School Field Research Program have found this result in a test plot with black plastic coverage. Thus repeated mowing of *Phragmites* (coupled with removal of stems) would need to be monitored carefully for elevation change, and **addition of clean sediment followed up with planting of native plants** as needed.

4) **Sea level is rising.** The long-term history of Piermont Marsh (Pederson et al., 2005)

reveals that average sedimentation rates since 1700 are about 1.1 inches/decade (2.9 mm/yr) but present sea level rise is regionally about 1.2 inches/decade (3.1 mm/yr) at the Battery, and projected to be 11-20 inches (279-508 mm) of sea level rise by 2050 (Horton et al., 2015). Attention should be given to possible sediment addition.

References: Hagen et al., 2007, Production of mummichog: response in marshes treated for common reed (*Phragmites australis*). Wetlands 27:54-67; Horton et al., 2015, NYC Panel on Climate Change 2015 report Ch.2: Sea level rise and coastal storms. Annals of the NY Academy of Sciences 1336:36-44; Martin, and Blossey, 2013. The Runaway Weed: costs and failures of *Phragmites* management in the USA. Estuaries and Coasts 36: 626-632. Pederson et al., 2005, Medieval warming, Little Ice Age, and European impact on the environment during the last Millennium in the Lower Hudson Valley, New York, USA Quaternary Research 63:238-249; Stabile et al., 2016, "Microsatellite DNA analysis of spatial and temporal population structuring of *Phragmites australis* along the Hudson River Estuary. Biological Invasions 18: 2517-2529; van Bruggen et al., 2018, Environmental and health effects of Glyphosate, Science of the Total Environment vol. 616-617:255-258.