VI. Summary

As was made clear in the site-by-site comparisons, correlation with the 1990 data proved to be a very challenging task. To begin with, volunteers were unable to find either tree tags or pole markers at any of the “permanent” sites. Nor was any positive indication of the 1990 surveys found in the areas surrounding the established sites. This is possible for the following reasons: Flag Ponds has experienced heavy storms resulting in many downed trees, both in uplands and lowlands; metal tags on trees are quickly overgrown or destroyed in 3-5 years; and heavy erosion/deposition along the coast has created drastic coastal changes every year, both in the coastline and in the lowland ponds.

The second challenge is that given the lack of global positioning equipment, the 1990 field surveys may not have been conducted precisely at the intended grid sites. The third challenge is that the 1990 surveyors did not give even a general description of the sites. They simply listed species. One does not know if, for example, they found a dozen red maples or only one small one, a field of mountain laurel or a single plant. One does not know if there were downed trees, streams, or trails. Hence, it is virtually impossible to confirm the 1990 field survey location, but there is strong evidence that they differ to some degree from the intended 1990 Permanent Plot locations.

One can say, with reasonable confidence, that the sites of the 1990 field surveys are generally in the same locale as the intended grid site, probably within less than one to two hundred feet. Still, this disparity is difficult to understand. The Methodology described in the Hench Report is very precise, as are the 1990 maps, i.e., the 1990 Habitat map shows detail distinguishing between narrow vegetation-covered sand dunes as distinct from open sandy areas.

As a result, we have only been able to document some general conclusions about the changes that have occurred at Flag Ponds based on these two surveys. In the process, much has been learned to provide better documentation for future long-term studies. This is particularly important with the recognition of the accelerating effects of global warming and the anticipation of rising sea levels, warming temperatures, and more frequent and violent storm events.

It is hoped that volunteers will be able to use the information assembled in this study to do more detailed surveys in the future. Possible studies include:

1. With the confirmation that the 1990 maps were based on the NAD 27 Plane Grid, it is now possible to convert any grid point or location from the NAD 27 to current NAD 83 geographic coordinates. A field study could compare the sites surveyed for this report using the NAD 83 coordinates of the 2016 study with the 2018 corrected NAD 27 conversions. (See Appendix B).
2. Use the data and descriptions of the A and B sites to establish a data base for monitoring coastal change as a result of climate change.
3. Use the data and descriptions of the A sites to establish a data base for monitoring the long term changes as a result of the living shoreline construction.
4. Given the enlargement of Flag Ponds by 90 acres and the lack of 1990 coverage of approximately 30% of the upland area in the northwestern section of Flag Ponds, over 150 acres of Flag Ponds remains completely undocumented.

Basic exploration of vegetation and habitat distribution for this area is a high priority.

5. Establish NS/EW transect studies to compare the validity of the 1990/ 2016 studies with the general environments of Flag Ponds.
6. Conduct an in-depth study of the abundance of plants found in 2016 that were not found in 1990.
7. Conduct a search for plants found in 1990 that were not found in 2016. This study might also expand to reintroducing these plants to Flag Ponds.
8. Intensive monthly study of plants and changes in selected sites for a year or more.
9. Studies of the presence and or expansion of invasive species that existed in 2016, but not in 1990, could be beneficial in establishing rate of invasion as well as conditions that promote the spread of invasive species.
10. Continue/complete the Habitat Surveys begun in 2014 using the protocol found in Appendix A.
11. Conduct Habitat Surveys in sites established by NAD 27 coordinates to compare with 2014-16 surveys using the protocol found in Appendix A.
12. Supplement and consolidate information from the above suggestions to establish comprehensive baselines for future data collection for long-term studies to evaluate global warming changes. Specifically,

    a.) Install a digital weather station at Flag Ponds to monitor long-term temperature changes and specific major storm occurrences. Section IV. Environmental Changes references the impact of severe weather, but the uncertainty in establishing which ones impacted Flag Ponds;

    b.) Install some sort of long-term water level monitoring for both sea level and pond levels;

    c.) Consolidate a comprehensive database for all species at Flag Ponds to include information on first occurrence and last observation, as well as first annual appearance of migratory species and the first flowering of angiosperms.

Flag Ponds Nature Park is a unique site along the Western Shore of Chesapeake Bay. It is located at a point of dynamic coastal changes while encompassing a large area of fairly undeveloped terrain. As such it presents a special opportunity for the documentation and study of long-term changes. We have learned that the study of long-term changes requires accurate and comprehensive documentation of baseline data. What has been presented in this report is only a start.