APPLIED WATERSHED SCIENCES

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October 8, 2024

West Hill Pond: September 11, 2024 - Late-Season Aquatic Plant Survey Results

At the request of the West Hill Pond Association, Applied Watershed Sciences LLC (AWS) performed a late-season aquatic plant survey on September 11, 2024. The goal of the survey was to search the littoral zone for any potential new or non-native aquatic plant species and to document the presence and coverage of aquatic plants. The extremely clear water conditions during the survey (~8m+ Secchi disk transparency) allowed the survey to be based on nearly all visual coverage estimates in water up to about 14ft deep. The deeper areas were surveyed via depth-sounder and a throw rake to sample bottom plants in many places, but the survey focused on mapping plants shallower than 14ft deep. In water deeper than 14ft, there were few to no true aquatic plants, and the 14-20ft area was typically dominated by a variable density covering of native *Nitella* sp. (plant-like macroalgae). Notes about prominent emergent shoreline wetland plants were also recorded, documenting mainly *Typha*, *Sparganium*, and *Schoenoplectus* species. Locations of observed filamentous green algae were also recorded.

The plant survey consisted of approximately 136 waypoints along the shoreline. Approximate depths were recorded for many of these waypoints. If the observed plants were in shallower water where the boat's depth sounder could not adequately record readings, or if the dense aquatic plant growth appeared to skew the depth sonar readings, the water depth was left off. In some cases, depth ranges of certain species were recorded as notes. Raw data is in .csv format. The point sizes on the maps provided in this report are based on the coverage estimates (Very Sparse 1-9% cover, Sparse 10-19%, Moderate 20-59%, Dense 60-79%, Very Dense 80-100%). The point size on the map does not indicate a specific acreage. Estimating the acreage of each species was not the goal of this survey, as acreage estimates tend to be very misleading due to the high %coverage range across scattered patches or plant beds. Plant height in the water column was estimated on a scale of 1-5 (Growth Form), where 1 indicates that a plant is very low in the water column, reaching just a few inches up from the sediment surface, while 5 indicates the species was growing to the surface and there were floating leaves and emergent/surface-matted parts of the plant present. A Growth Form value of 2.5ft in the raw data indicates that plants grew to about half the water column depth. Often the height of plants will vary across an observation area; recorded values can be assumed as averages across the observation site. Please note that plant density categories (based on %coverage) and the plant height will change throughout the season, and this survey is best compared to other historical fall survey data rather than early summer data.

AWS was able to make a limited comparison of the September 2024 overall species frequencies (the fraction of the total number of observation points where a particular species was recorded) to the September 2016 survey results from Northeast Aquatic Research. The survey methods from 2016 to 2024 were very similar, but the exact number of observation points and the locations of observation points are not the same. Yet AWS believes the overall results provide good insight into the increasing lake-wide frequency of several species over the past eight years. While a few percentage points difference across a few species would not be considered a significant increase over time, the most frequent species in 2024 were all considerably more common than in 2016. The frequency comparison data echoes our overall observational impression of West Hill Pond over the last decade, where aquatic plants appear to spread and become denser over time despite the annual diver-removal of large beds of *Potamogeton amplifolius.* These results are not surprising given that plant growth generally increases in lakes over time as a symptom of slow eutrophication.

Sincerely,

Hillary Kenyon, M.S.
Principal Consultant
Certified Lake Manager #17-07M

Table 1. West Hill Pond: Submersed Aquatic Plant Overall Frequencies Comparison

Scientific Name	Common Name	September 2024 % Frequency	September 2016 % Frequency (NEAR)
Potamogeton epihydrus	Ribbon-leaf pondweed	36	11
Potamogeton robbinsii	Robbin's pondweed	27	1
Vallisneria americana	Tapegrass	25	2
Glossostigma cleistanthum	Mudmat	24	0
Sagittaria graminea	Narrow-leaf Arrowhead	22	10
Lobelia dortmanna	Water Lobelia	21	10
Potamogeton amplifolius	Large-leaf pondweed	20	7
*Nothing present	NA	16	NA
Typha sp. (shore)	Cattails	6	5
Nuphar variegata	Yellow-waterlily	5	5
Eleocharis acicularis	Needle spikerush	4	7
Filamentous green algae	NA	3	5
Fontinalis sp.	Aquatic Moss	3	5
Potamogeton bicupulatus	Snailseed pondweed (narrow-leaf)	3	2
Elatine minima	Small waterwort	2	6
Brasenia schreberi	Watershield	1	1
Elodea nuttallii	Waterweed	1	0
Potamogeton pusillus	Small pondweed (narrow-leaf)	1	0
Potamogeton spirillus	Spiral pondweed (narrow-leaf)	1	0
Schoenoplectus sp.	Bullrush	1	0
Sparganium americanum	American bur-reed	1	0
Utricularia radiata	Small floating bladderwort	1	0
Nitella sp. (<14ft water, very common in deep water)	Plant-like macroalgae	6	23 (NEAR 2-day survey included more deep water points)


West Hill Pond Watershield September 11, 2024 (Brasenia schreberi)
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West Hill Pond Small waterwort September 11, 2024 *(Elatine minima)*

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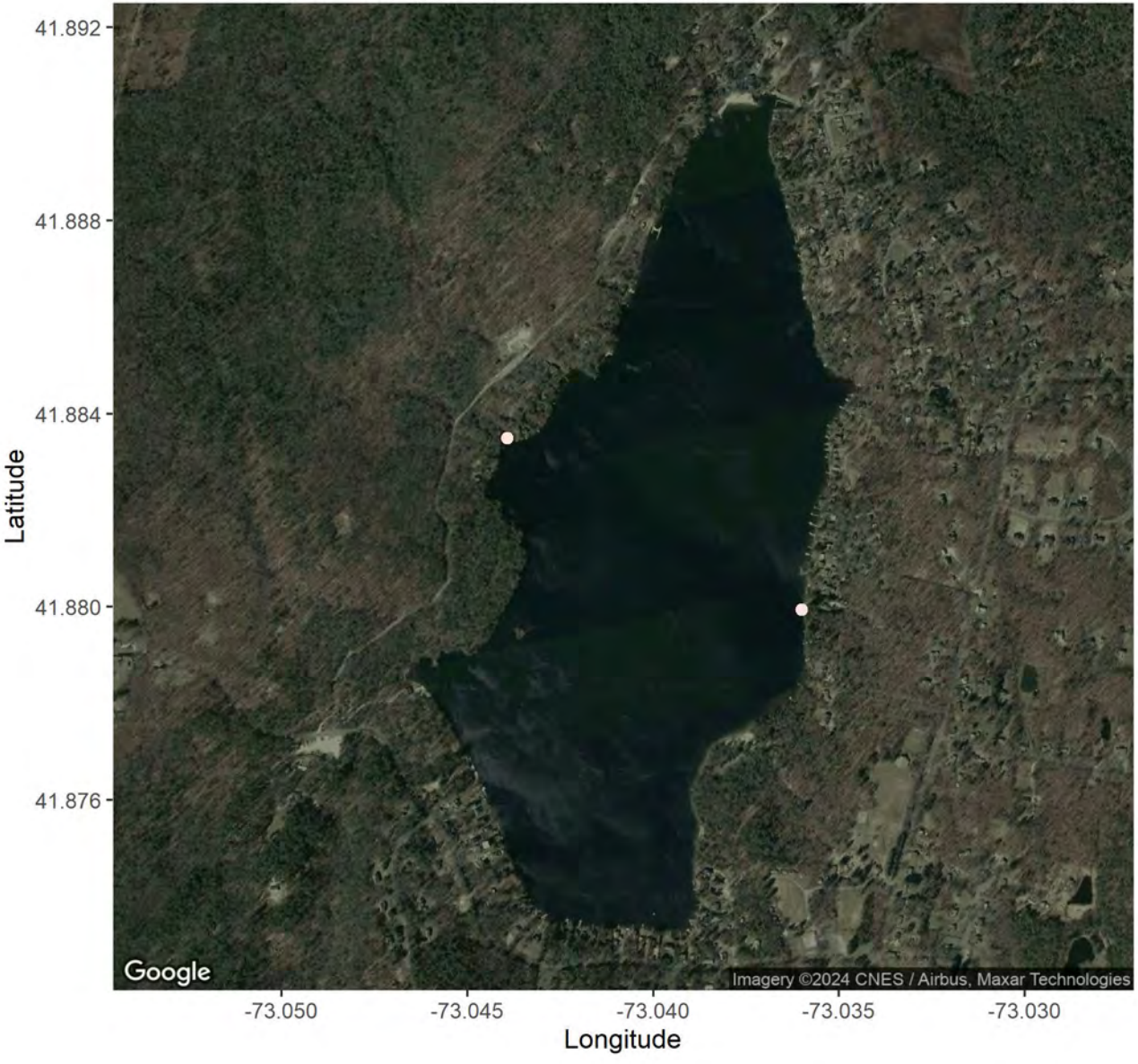

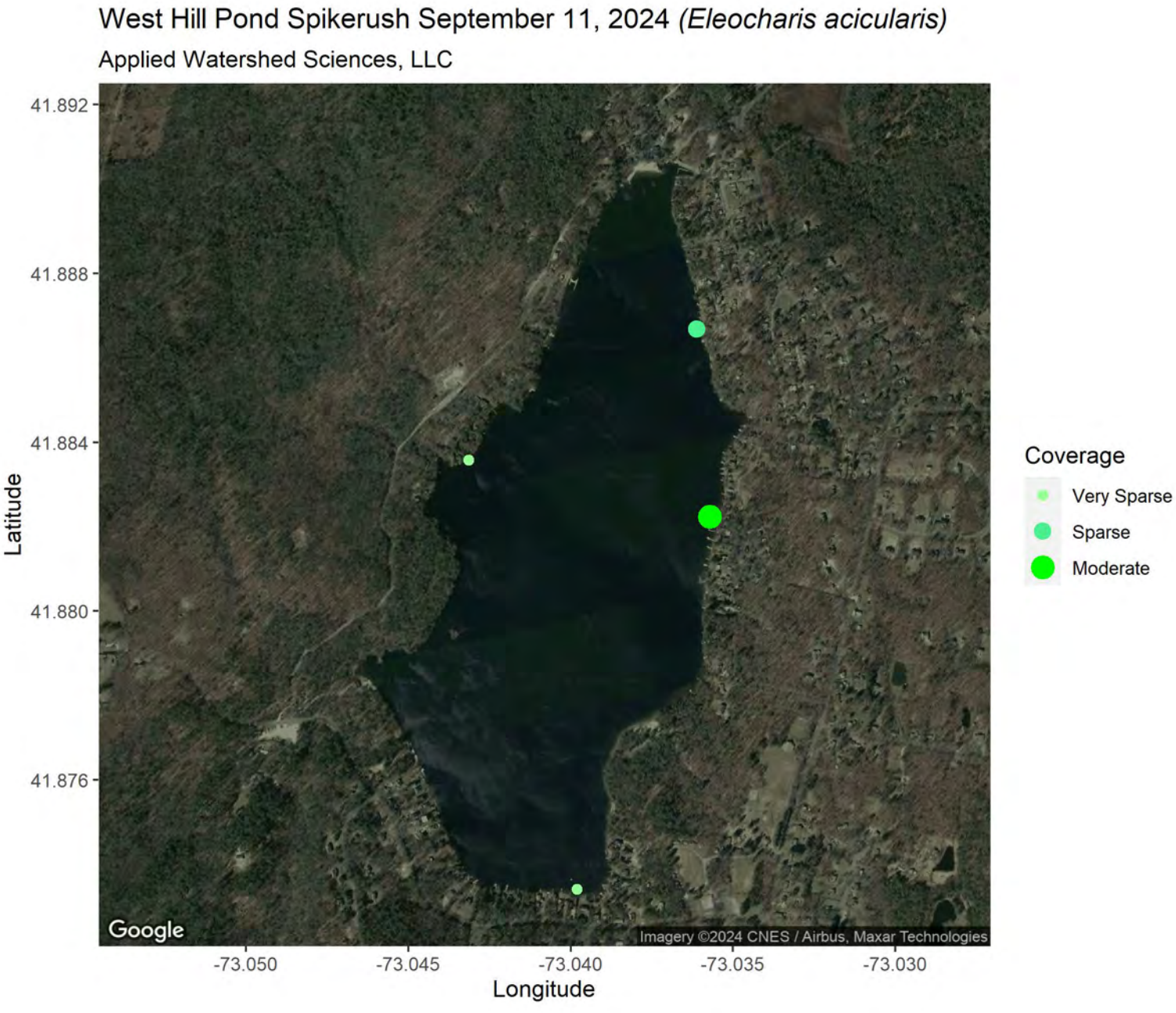
West Hill Pond Spikerush September 11, 2024 (Eleocharis acicularis)
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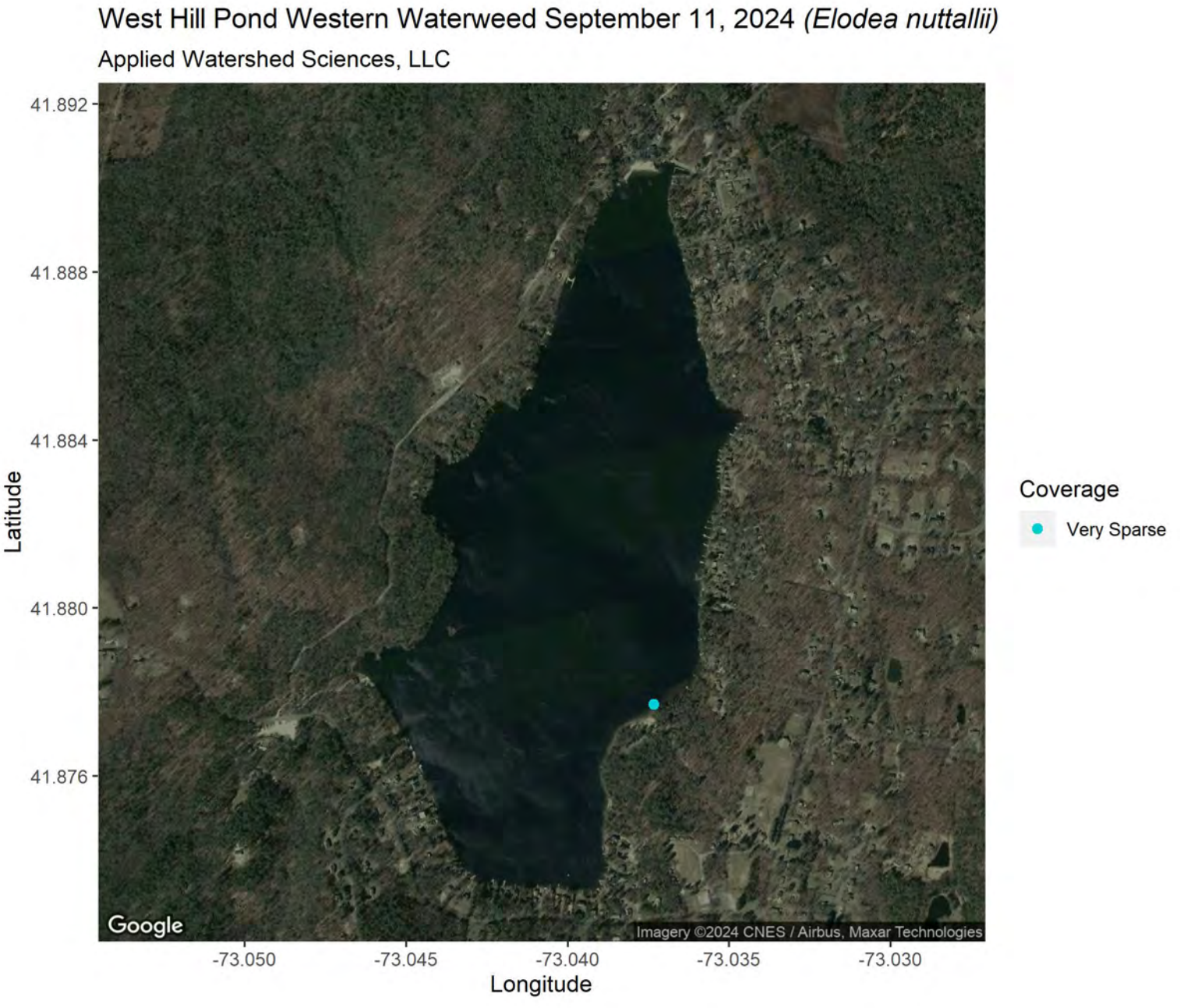
West Hill Pond Western Waterweed September 11, 2024 (Elodea nuttallii)
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West Hill Pond Filamentous green algae September 11, 2024
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West Hill Pond Aquatic Moss September 11, 2024 *(Fontinalis sp.)*

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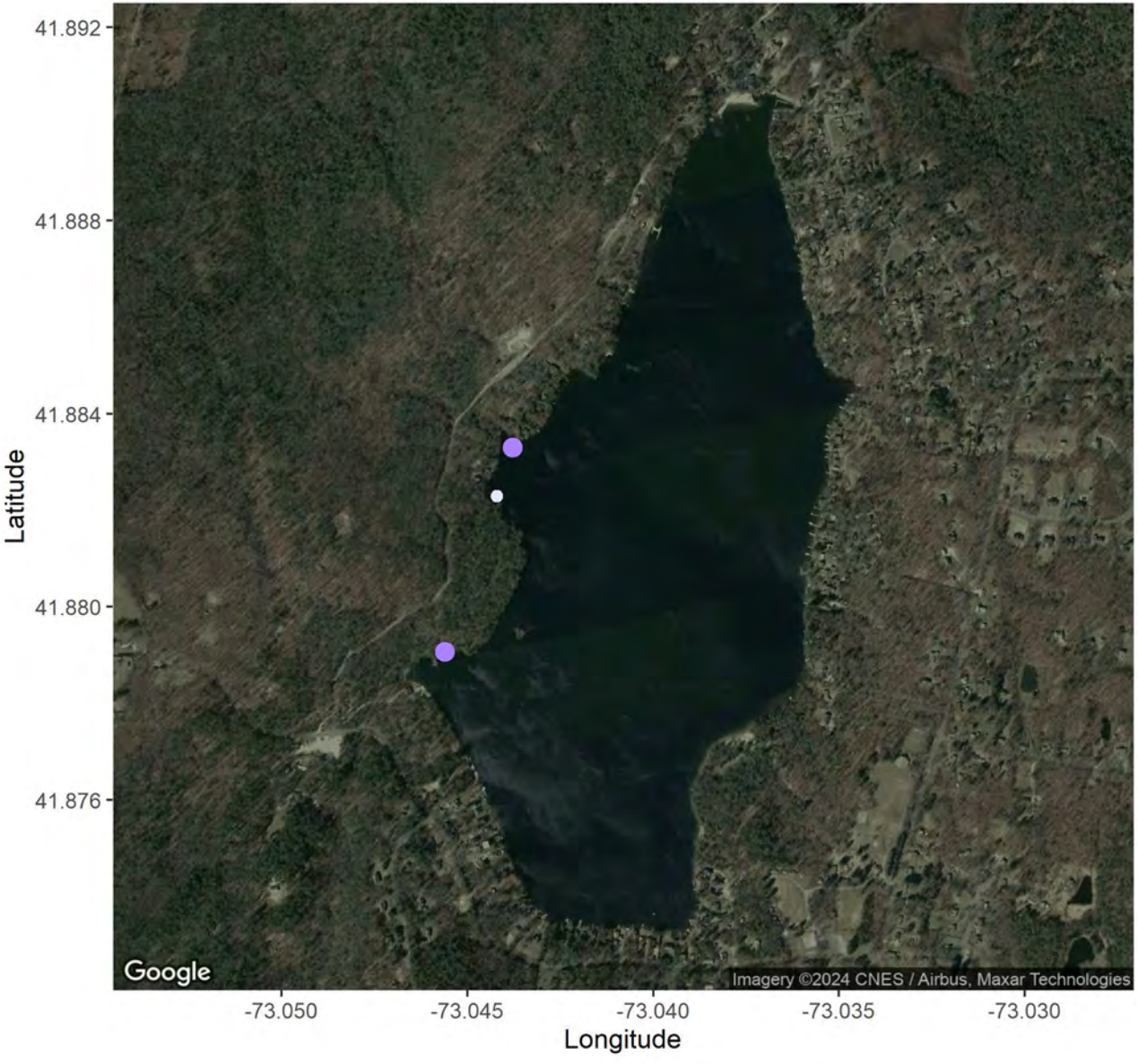

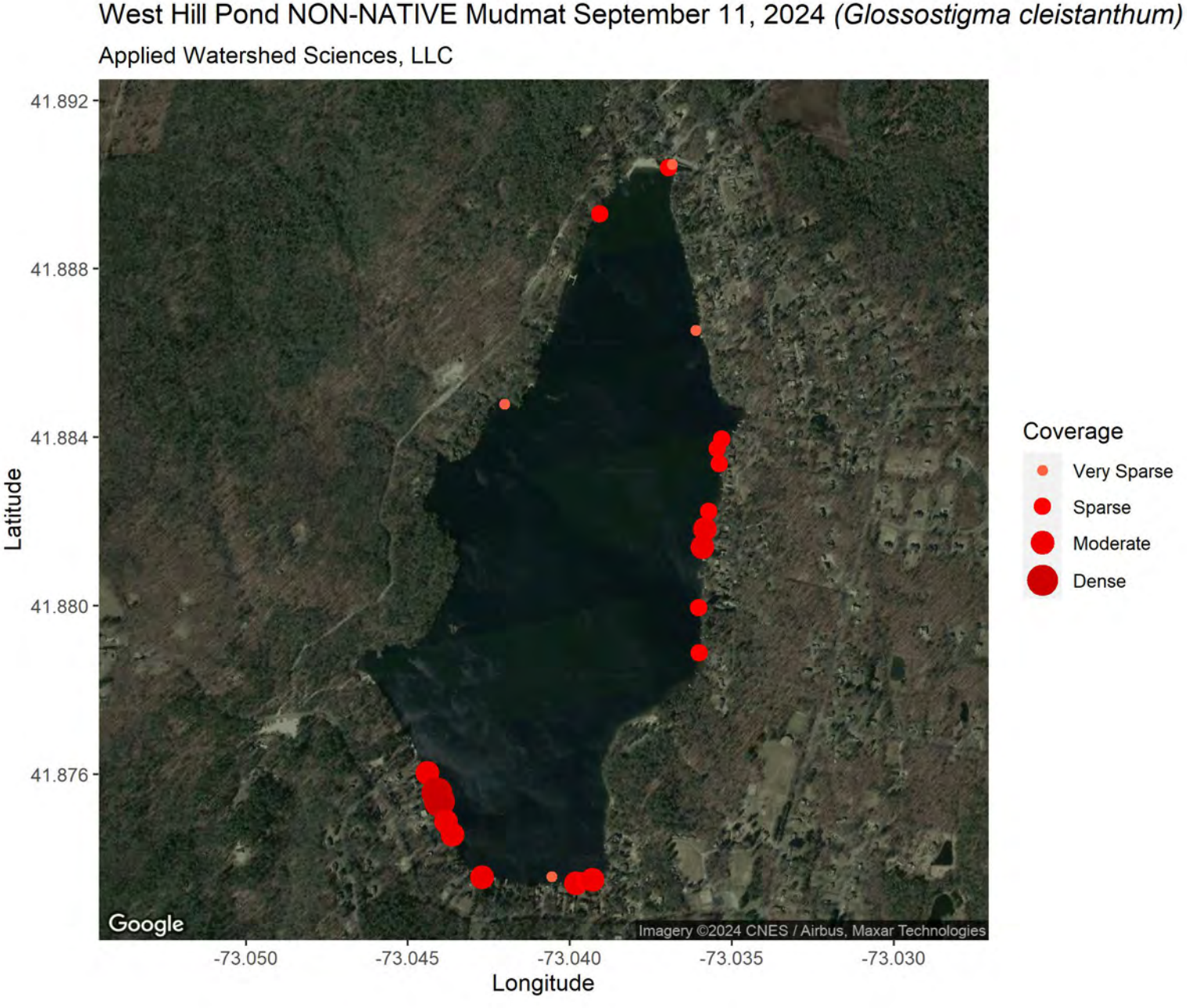
West Hill Pond NON-NATIVE Mudmat September 11, 2024 (Glossostigma cleistanthum)
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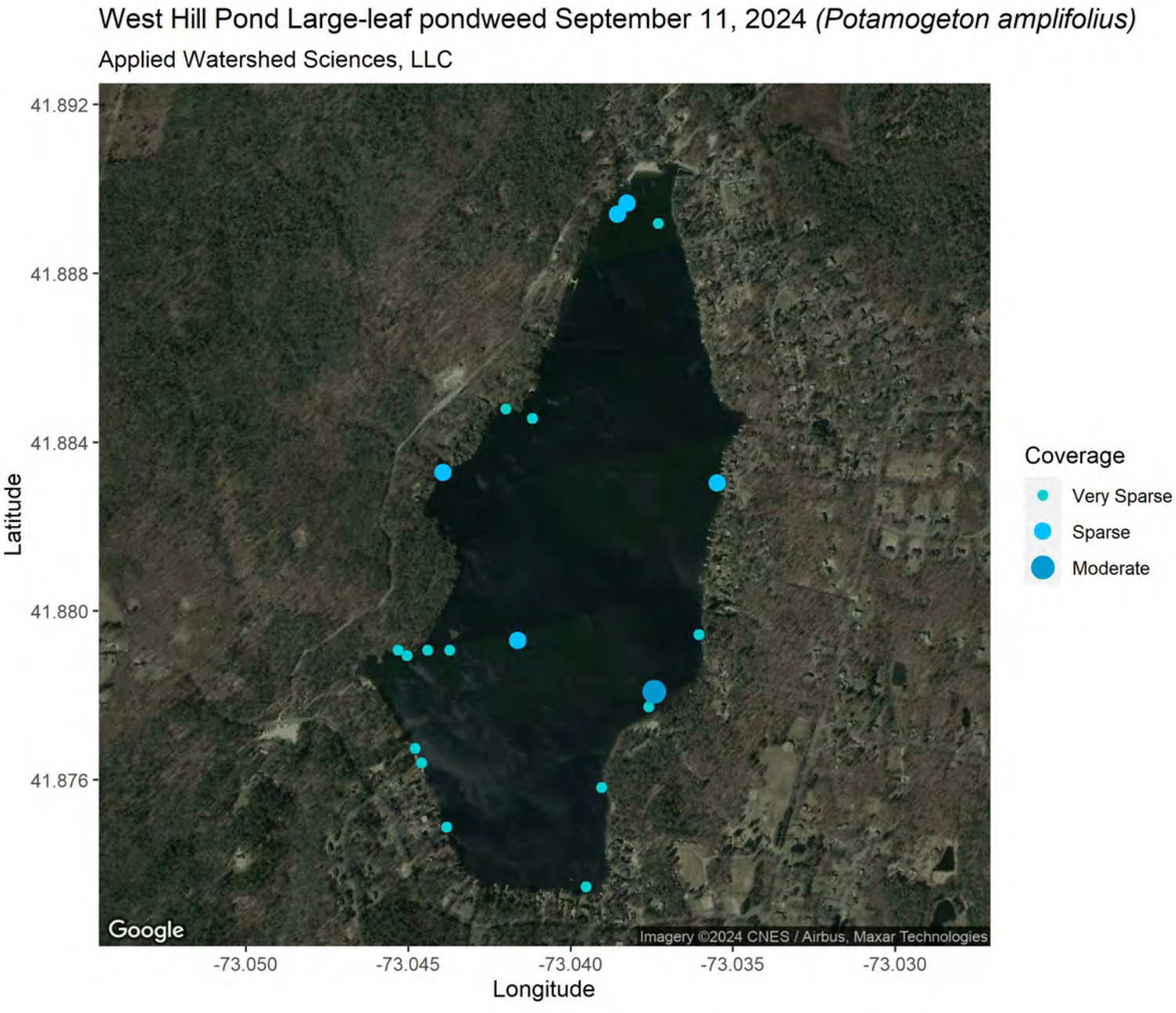
West Hill Pond Large-leaf pondweed September 11, 2024 (Potamogeton amplifolius)
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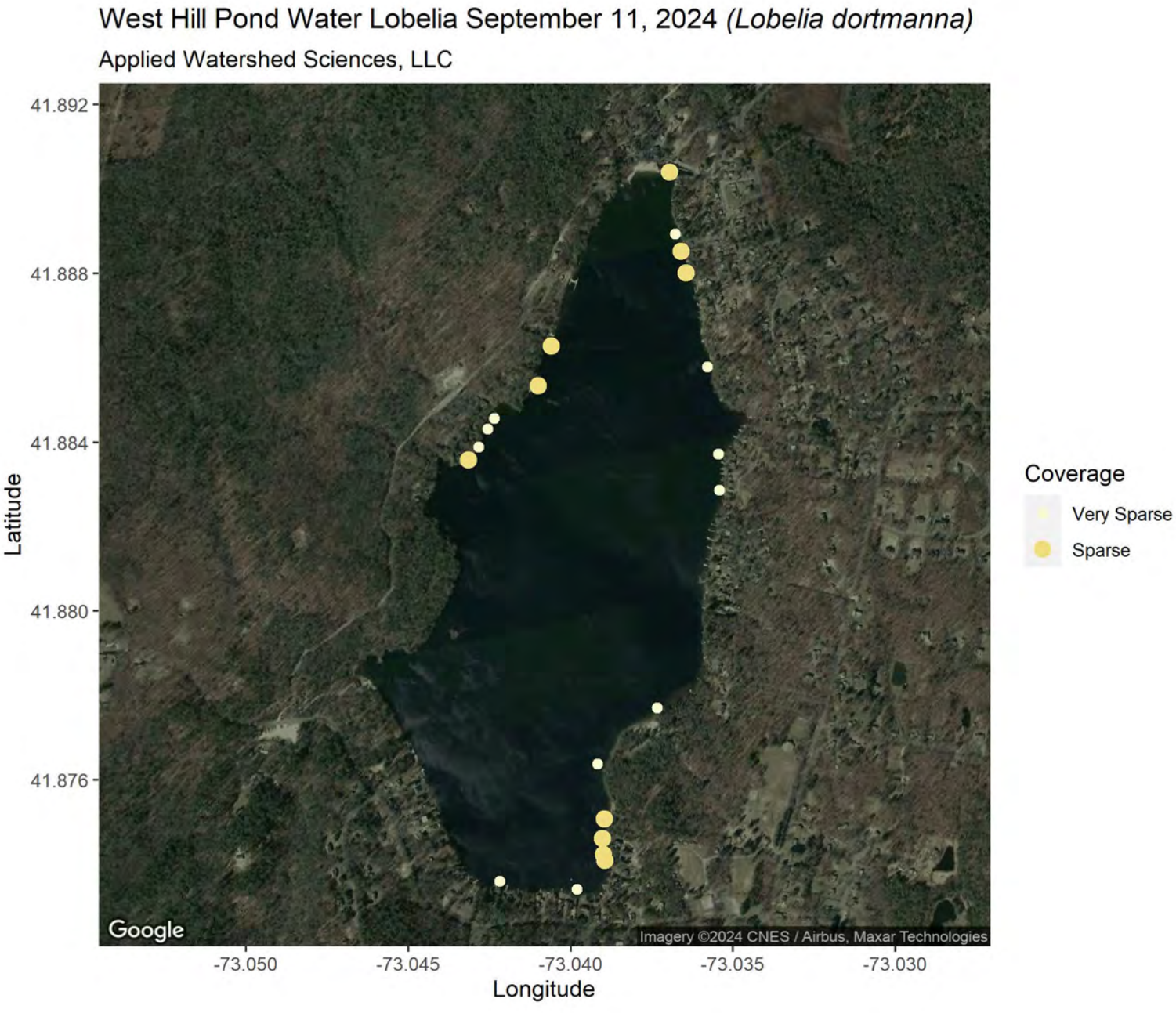
West Hill Pond Water Lobelia September 11, 2024 (Lobelia dortmanna)
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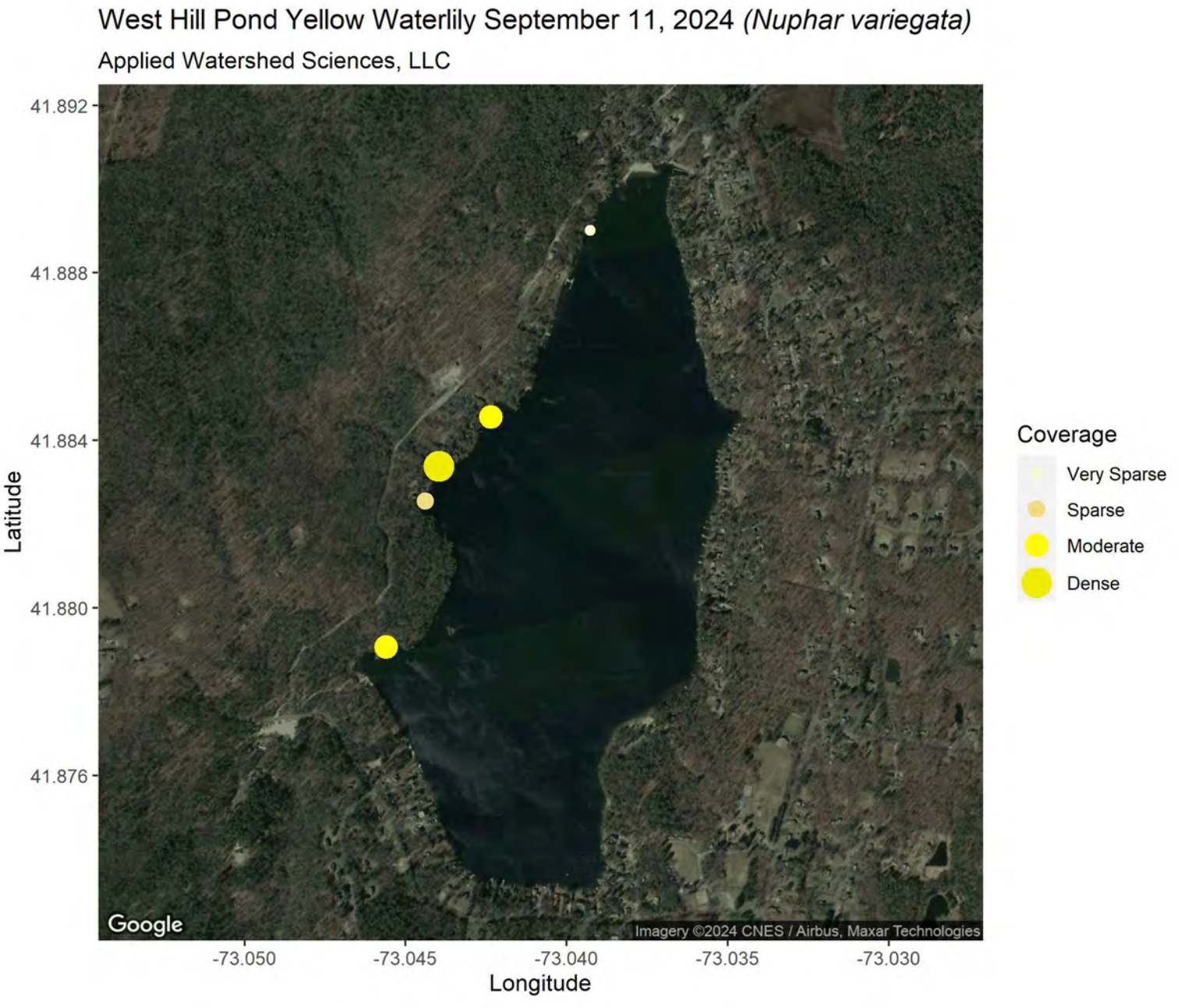
West Hill Pond Yellow Waterlily September 11, 2024 (Nuphar variegata)
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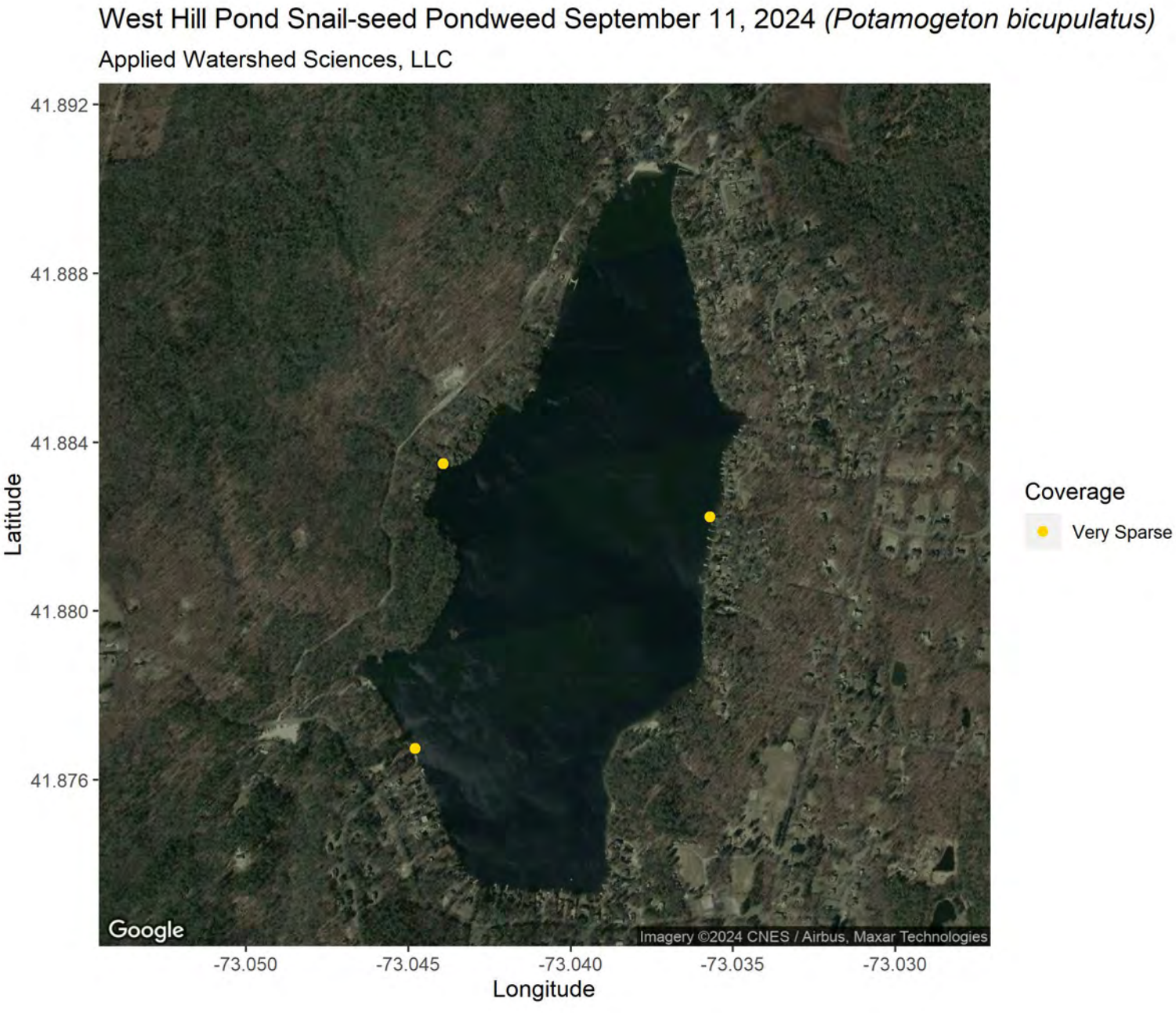
West Hill Pond Snail-seed Pondweed September 11, 2024 (Potamogeton bicupulatus)
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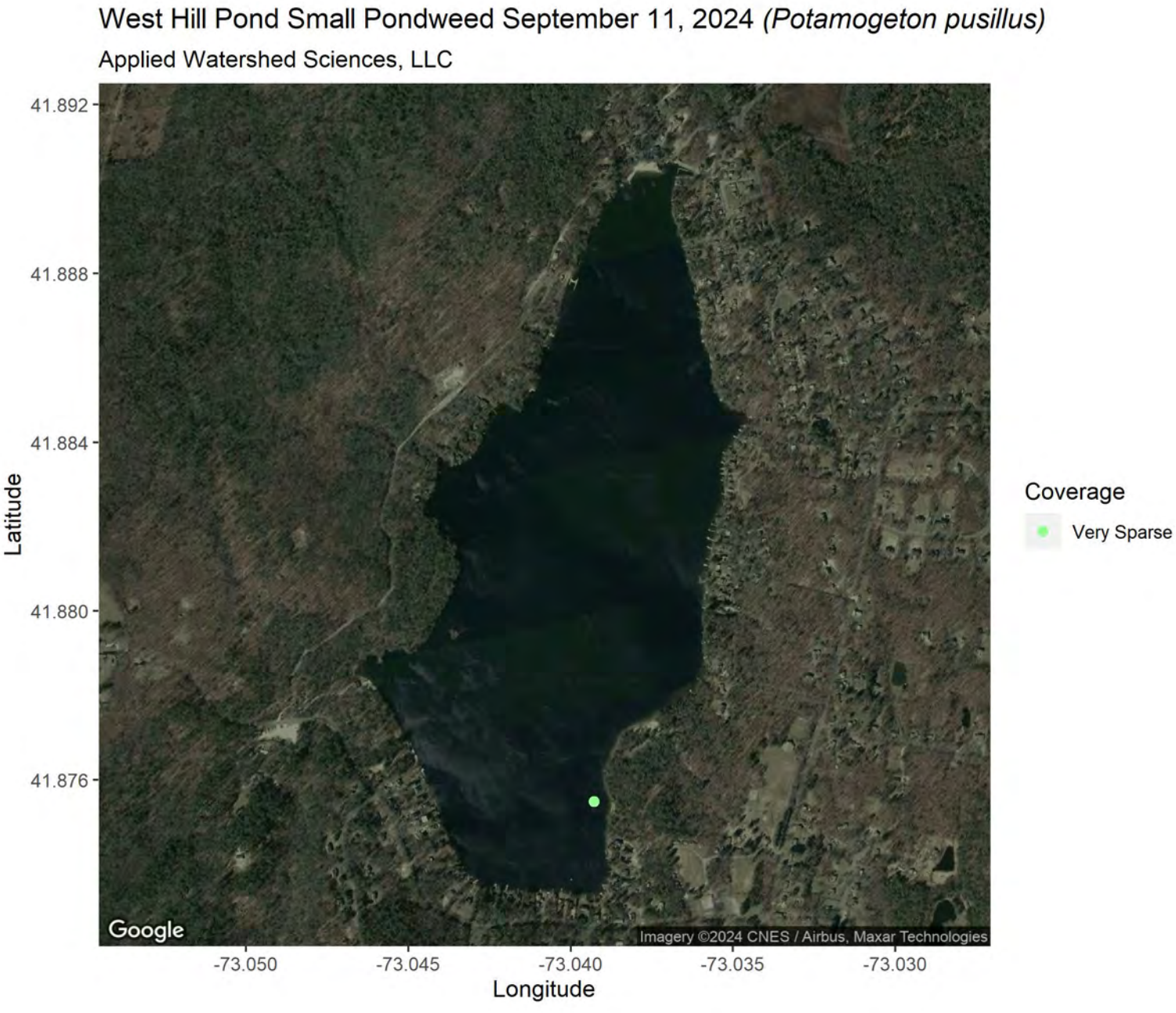
West Hill Pond Small Pondweed September 11, 2024 (Potamogeton pusillus)
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West Hill Pond Robbin's Pondweed September 11, 2024 *(Potamogeton robbinsii)*

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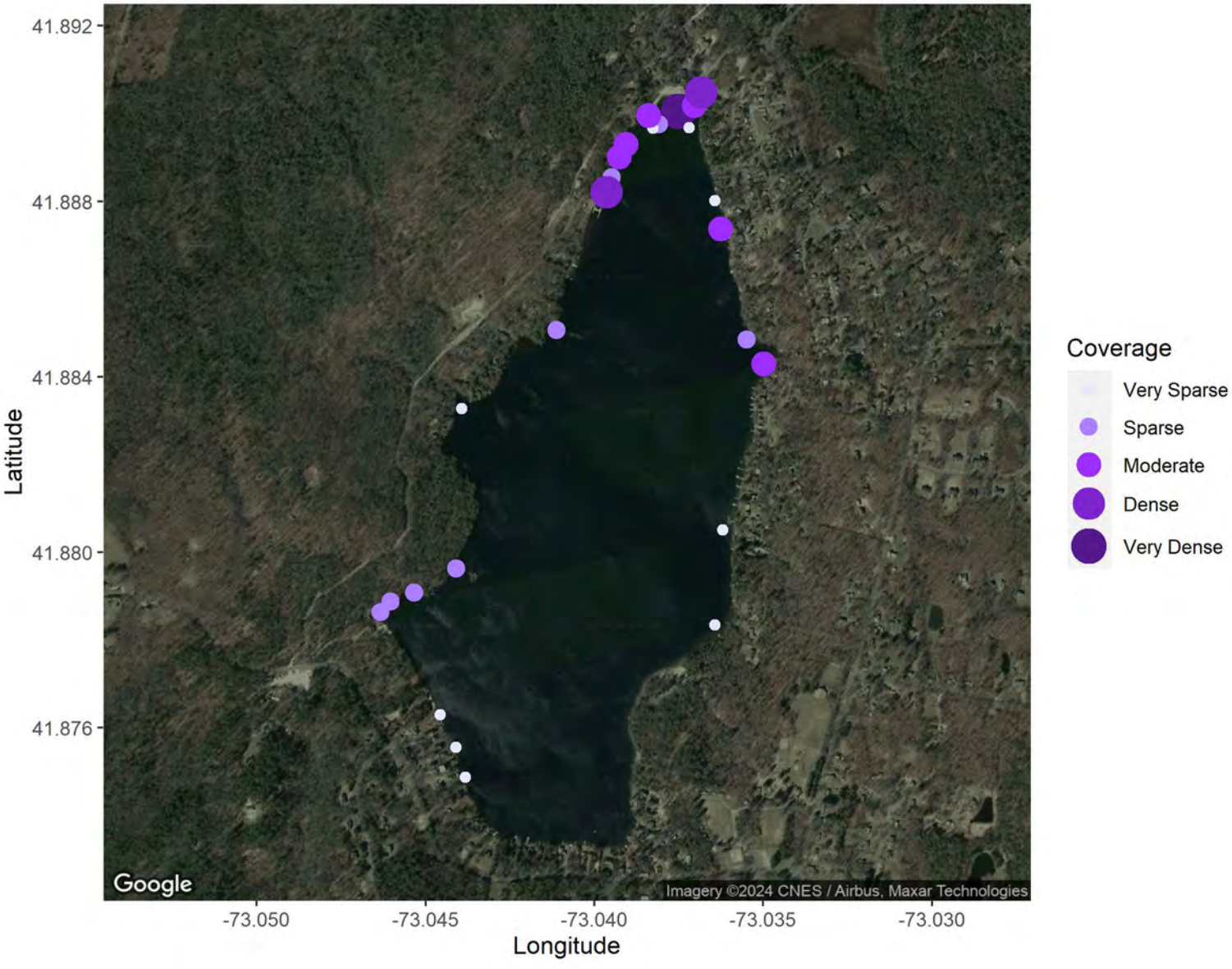

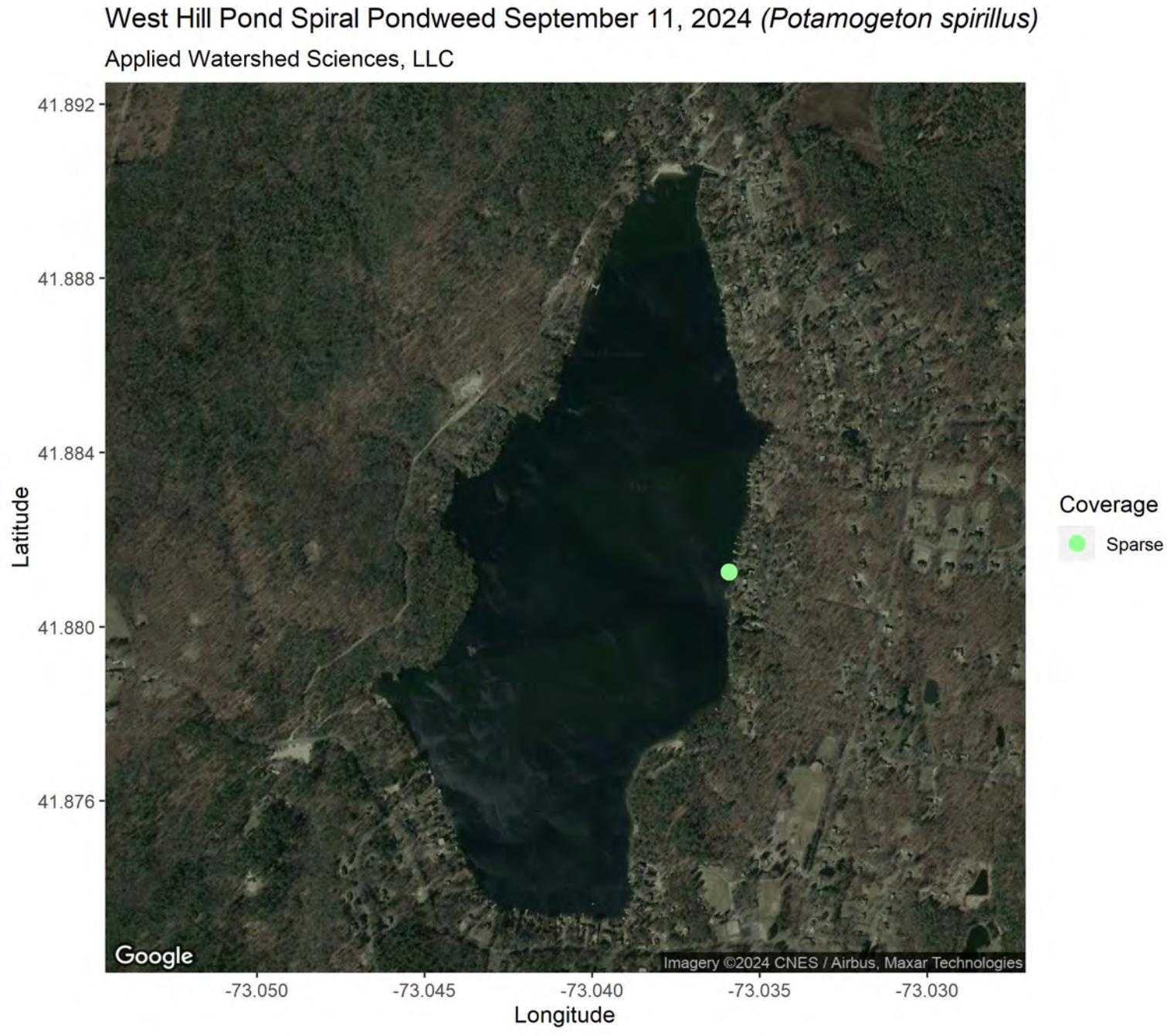
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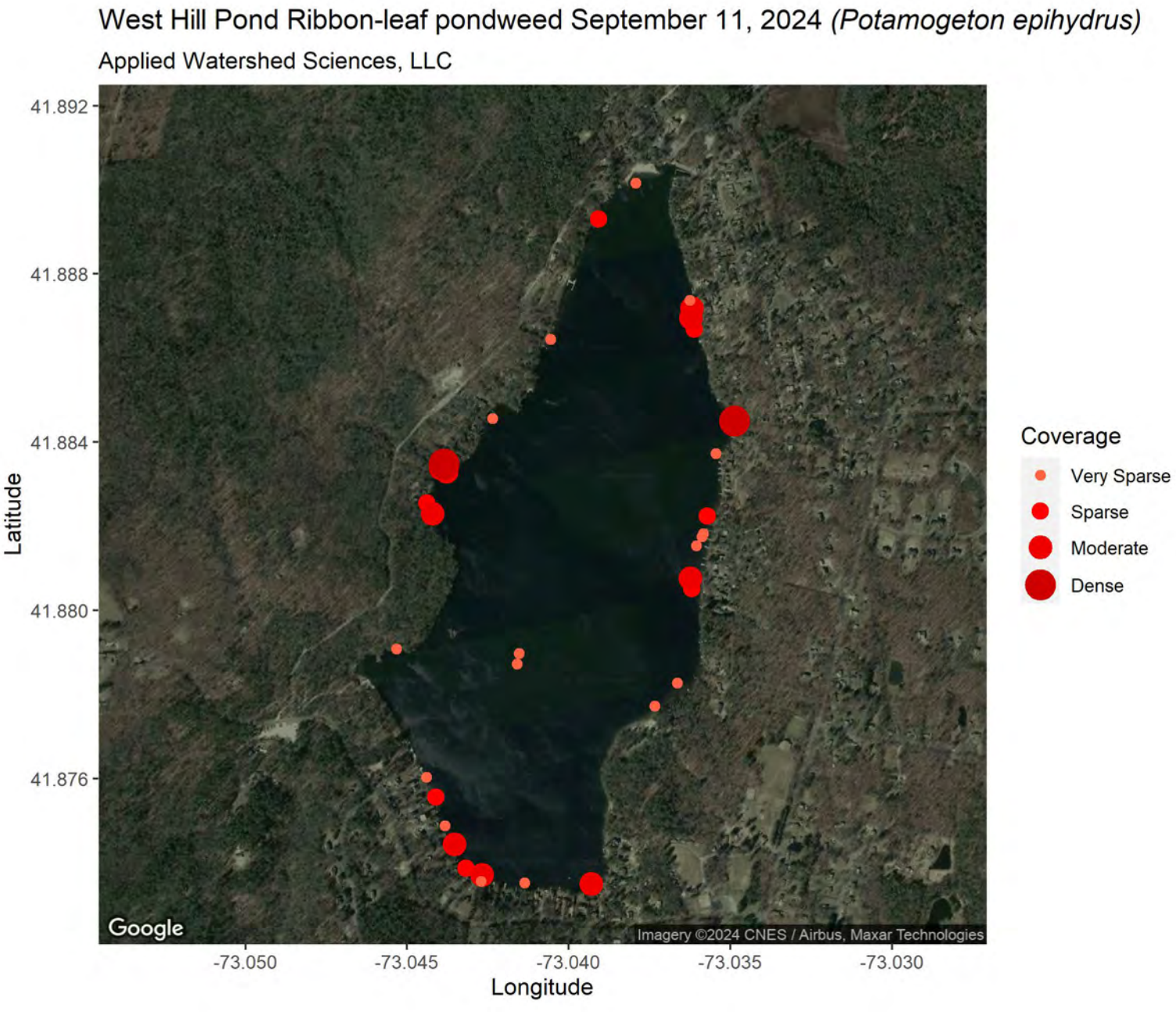
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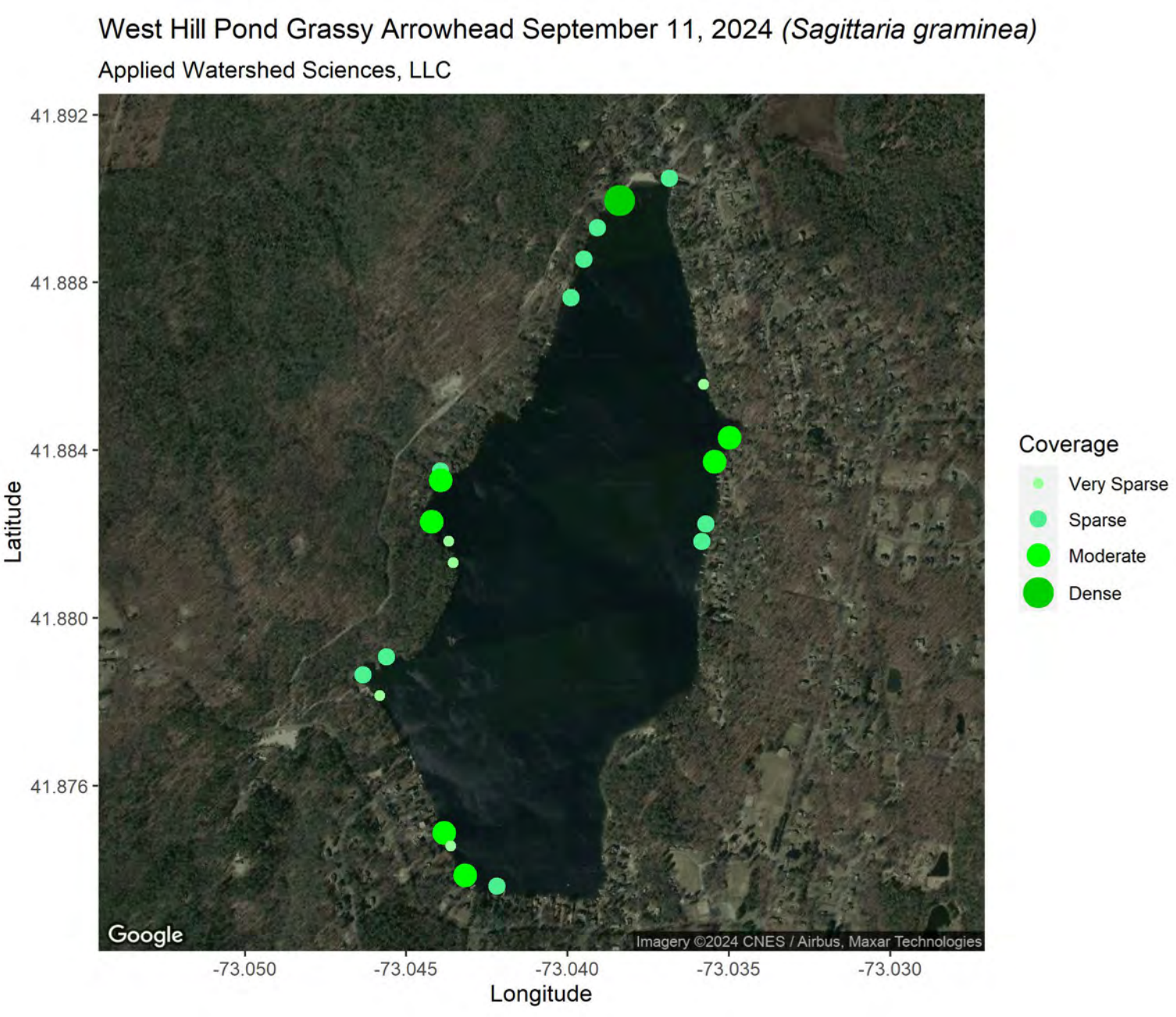
West Hill Pond Grassy Arrowhead September 11, 2024 (Sagittaria graminea)
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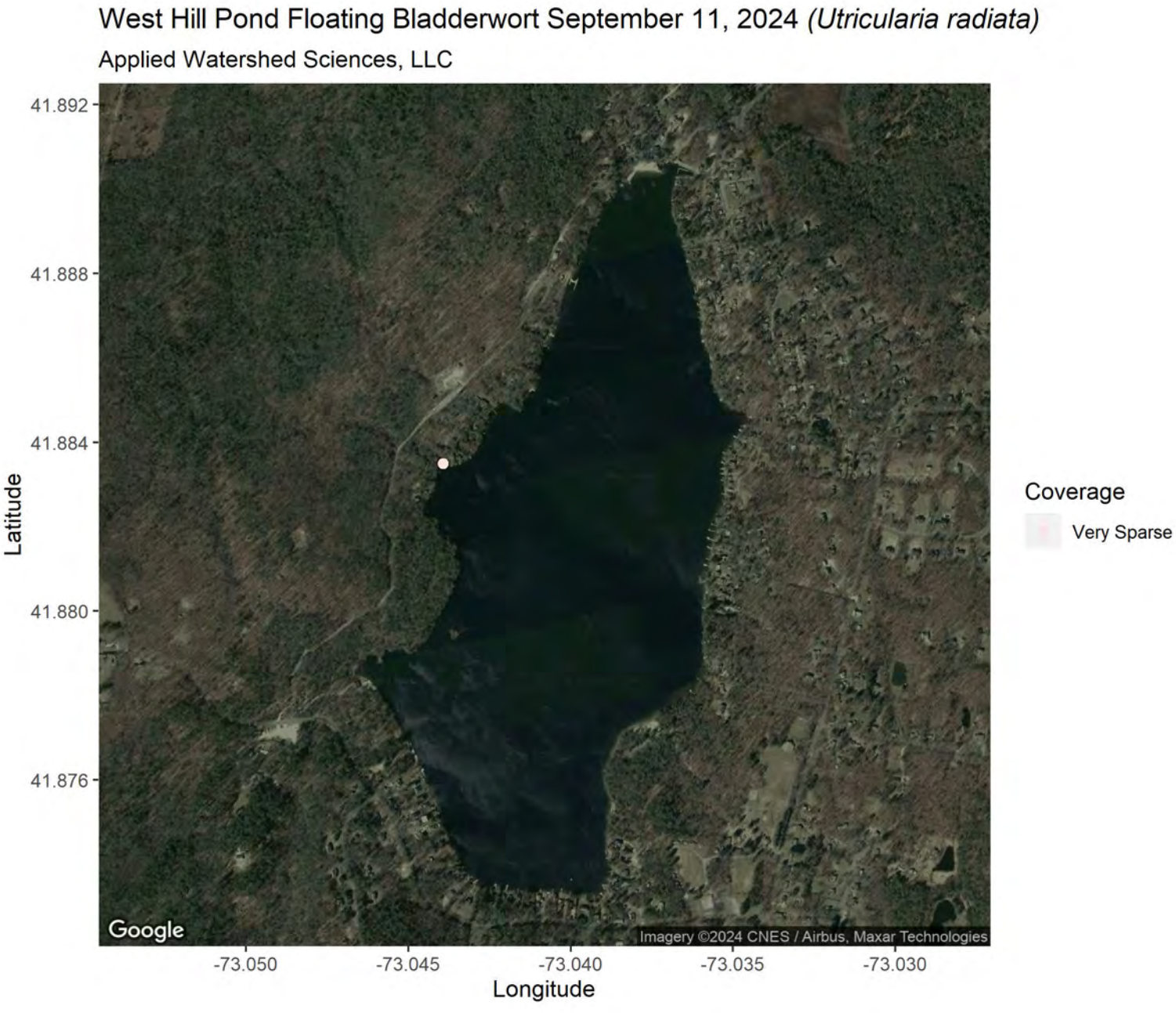
West Hill Pond Floating Bladderwort September 11, 2024 (Utricularia radiata)
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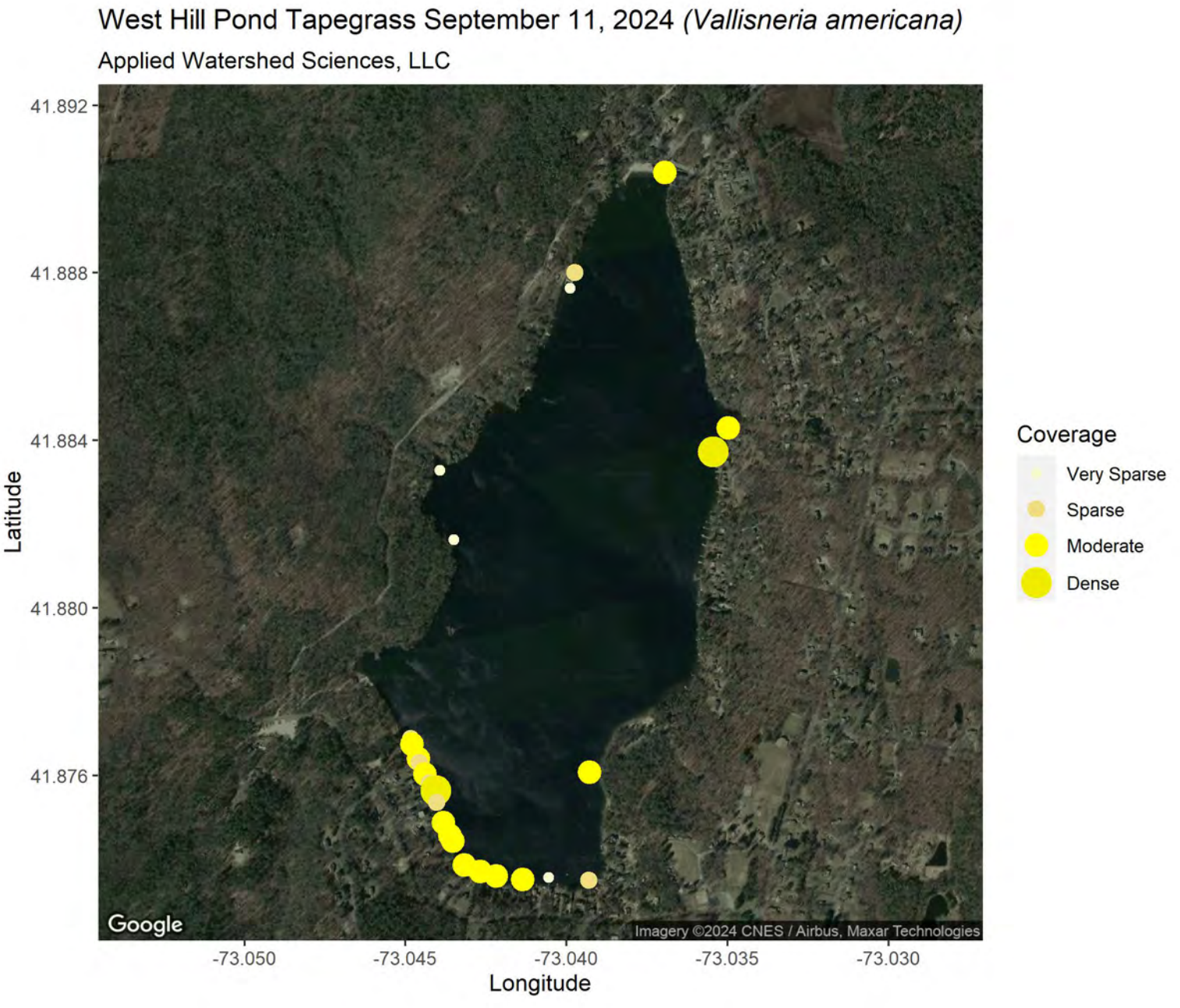
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