Tussocks or Floating Islands on Lake Okahumpka

Dan Kane August 2024

I became very interested in the lake in December of last year (2023) after a very heavy rain storm brought 4.7" of rain and very high winds during Dec. 16-17. The result was very high Lake Okahumpka water levels, which we all noticed at the Gazebo area.

In addition, many of us were introduced to tussocks or floating islands. A major tussock was blown into the inlet isolating CCC from the by the storm.

This report primarily concerns the tussocks or floating islands. It consists of referenced excerpts from Univ. of FL. (1), Lake Okahumpka water level historical records (2), Wind direction-velocity charts from Univ. of Iowa (3), and my own observations and conclusions. I wish to share this effort, some of which was prompted by comments on the Discussion Group.

Reports on the lake levels and what contributes to those levels will follow, and some of this is already on the CCC website (see "Resources"). These are a result of study and calculations during winter-spring of 2023-2024

Figure 1

Inlet Blocked by tussock after Dec 16-17 2023 Storm

"(Mr. Burr)
Thank you for contacting the FWC with your issues on Lake Okahumpka. Our Biologist surveyed the lake Monday this week and reported that both public boat ramps were open and accessible. A floating tussock had blown into the Rabbit Trail canal, however. Working under contract with the FWC the Southwest Florida Water Management district has been tasked with treating and/or pushing the tussock away from the canal. They have it tentatively scheduled for 12/20 or 12/21 dependent upon weather conditions. Please contact me or our invasive plant biologist, Nathalie Visscher (vathalie.visscher@myfwc.com), directly if you have any additional questions.
Sincerely,
Rob Kipker, Biological Administrator
FWC, Invasive Plant Management
rob.kipker@myfwc.com"

See "**The Lake and the Land**" page via "**Resources**" on the **CCC website. Look for images of the tussock removal by airboats pushing it away.**

So what are tussocks and floating islands and how they form?

I have visited many sources and have not found consistent definition as to the difference between the two terms, so let's use the two names interchangeably as FWC seems to do. The Univ. of Fla. (Ref 1 below and verbally trimmed …) does differentiate the two by the type of composition of material.

"Tussocks are rafts of herbaceous plants that form in a number of ways. Floating invasive plants ….. And even native floating plants ……. can form large rafts that act as a substrate for emergent plants to colonize. Emergent plants …. Tie the rafts together below the surface with their roots, and above the surface with stems and branches. Native emergent species, such as pennywort …. And smartweed …., grow from the shoreline to form mats across the water surface. If the mats become large enough, wind and wave action can tear them loose, generating floating tussocks. The non-native Cuban club-rush …, grass-like sedge, sends long runners among and over other emergent plants can eventually displace them with a floating tussock of Cuban club-rush. As water levels increase after drawdowns or droughts, masses of spongy plants like cattail and pickerelweed can pull loose from shallow soft mud flats." (Ref 1)

"**Floating islands** can form in the same manner as tussocks. They are comprised of aquatic and sometimes upland plants, and herbaceous and woody plants. Most importantly, they are characterized by suspended masses of organic deposits like peat and mud that vary from a few inches to a few feet thick. In some cases, the sediments are compact or fibrous enough that the emergent plants, whose roots are interwoven into the sediments, pull as much as several feet of organic material with them to the surface as lakes re-fill after a prolonged drought. Such was the case with hundreds of acres of floating islands drifting in Hernando Pool of the Tsala Apopka Lake / marsh system, and Lakes **Okahumpka** and Runnymede." (Ref. 1 which is also on our CCC website: read it all)

"Why is this becoming a problem?" - Another great question from a resident. (Ginger King Robertson March 28. 2024 ...Discussion Group). **Our residents are wise and inquiring**.

Tussocks were around, certainly, for many years but only this past year did they become a noticeable and distressing issue to most of us. Sure, they were out on the lake, but never this big (maybe) and noticeable; certainly no one remembers any coming to block the inlet. So why was Dec 2023 different?

Over the years, there have been many cycles of low followed by high lake water levels, providing many chances for tussock formation

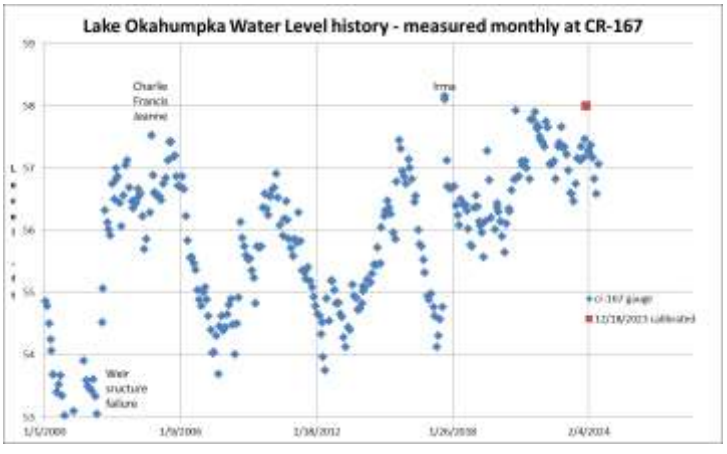


Figure 2 the visually read (one per month) values from the SWFWMD gauge (2) demonstrate the fluctuations in lake level. Note the trend towards consistently higher levels in the last few years. The low to high cycling breaks the tussocks away from the bottom, but the high levels allow them to be moved by wind and thereby freed. Recent Long periods of high level make them more likely to pull free and be blown around the lake. The worst case would be a tussock which stayed long enough to anchor in the inlet when the lake level drops.

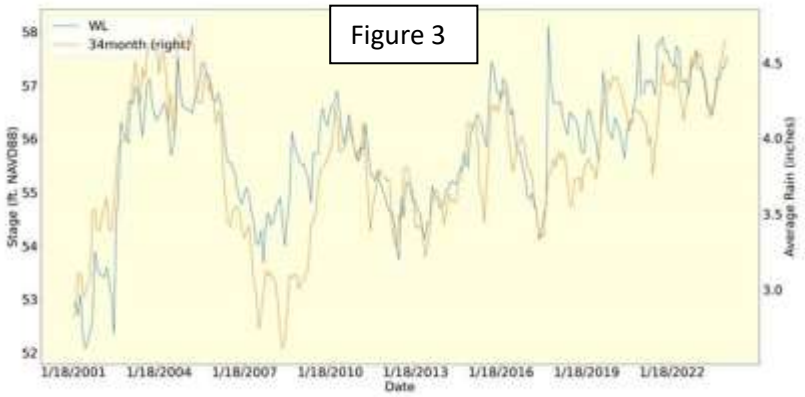


Figure 3

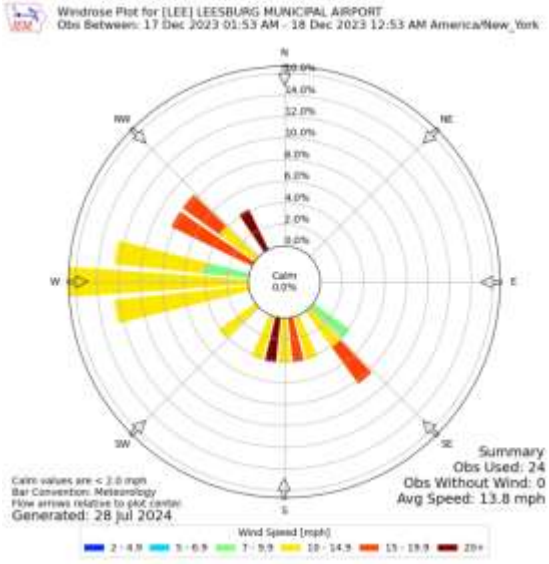
I asked SWFWMD about correlations between lake level and rainfall. "After looking at the relationship between rainfall and water levels on the lake, there is a strong correlation (Pearson correlation coefficient 0.78) with the previous 34-month average rainfall which you can see in the graph below. This is close to the 3-year (36 month) average which is also strongly correlated (0.77), so taking a look at the 3-year average rainfall totals does reveal that the last 3-year average (21-23) has been the highest 3-year average rainfall dating back at least since the current structure has been in place. Going back even just slightly further, the 3-year average from 2020-2022 is the 4th highest 3-year average. Just a quick look into some of the surrounding lake levels reveals a similar pattern on these lakes as well"

T.J. Venning Staff Environmental Scientist
Environmental Flows and Levels Section
Natural Systems and Restoration Bureau
Southwest Florida Water Management District

So what brought the tussock to the inlet?

There have been years of tussock creation due to low-high water level fluctuations and a long 3-4 year of high water period enabling tussocks to free up. Then arrived the large storm of Dec 16-17, 2023, which yielded 4.7" of rain, strong **west winds** blowing across the lake toward the gazebo during Dec. 17-18 and thereby the inlet blocking tussock.

"**I would guess most end up on the west end as per normal wind currents",** Richard Bruce Apr 13, 2024, Discussion Group
"but the wind is blowing from the gazebo toward the lake", Rick Ramstack: correcting my snowbird idea of prevailing winds. Our residents are wise and inquiring.

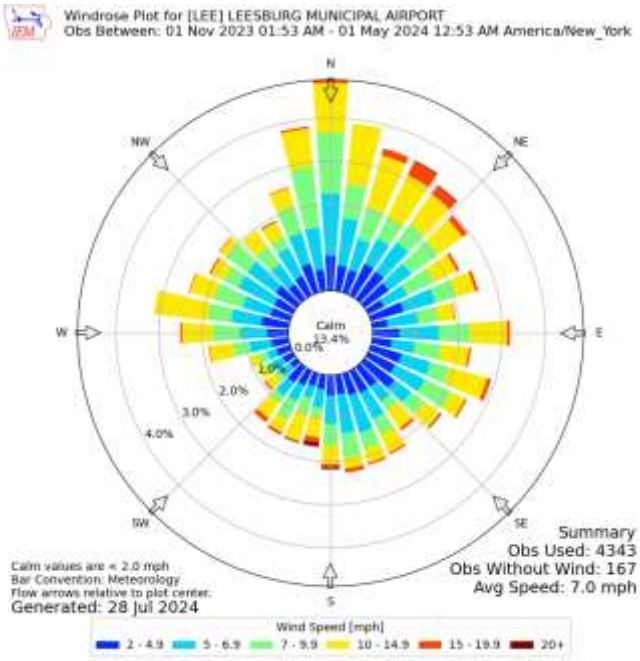


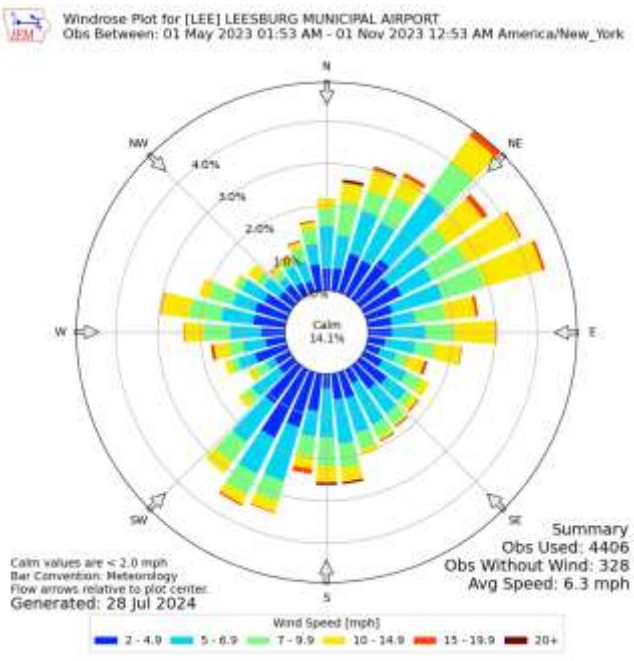
It took both the sudden large rain combined with the strong, uncommon west wind to free the large tussock and move it to the position of blocking the inlet. Winds exceeded 20 mph with much higher gusts during the period.

The wind rose to the left shows the direction and speed of the wind during the second rainy day, December 17 (waning storm) and the subsequent also west-windy day Dec 18. These data were recorded at the Leesburg Airport. Data provided by Univ of Iowa (3)

The below wind roses represent winds for the past year. Two wind roses show last ‘summer’ (May-October) and last ‘winter’ (November-April). *Winds from the west are certainly not prevailing.*

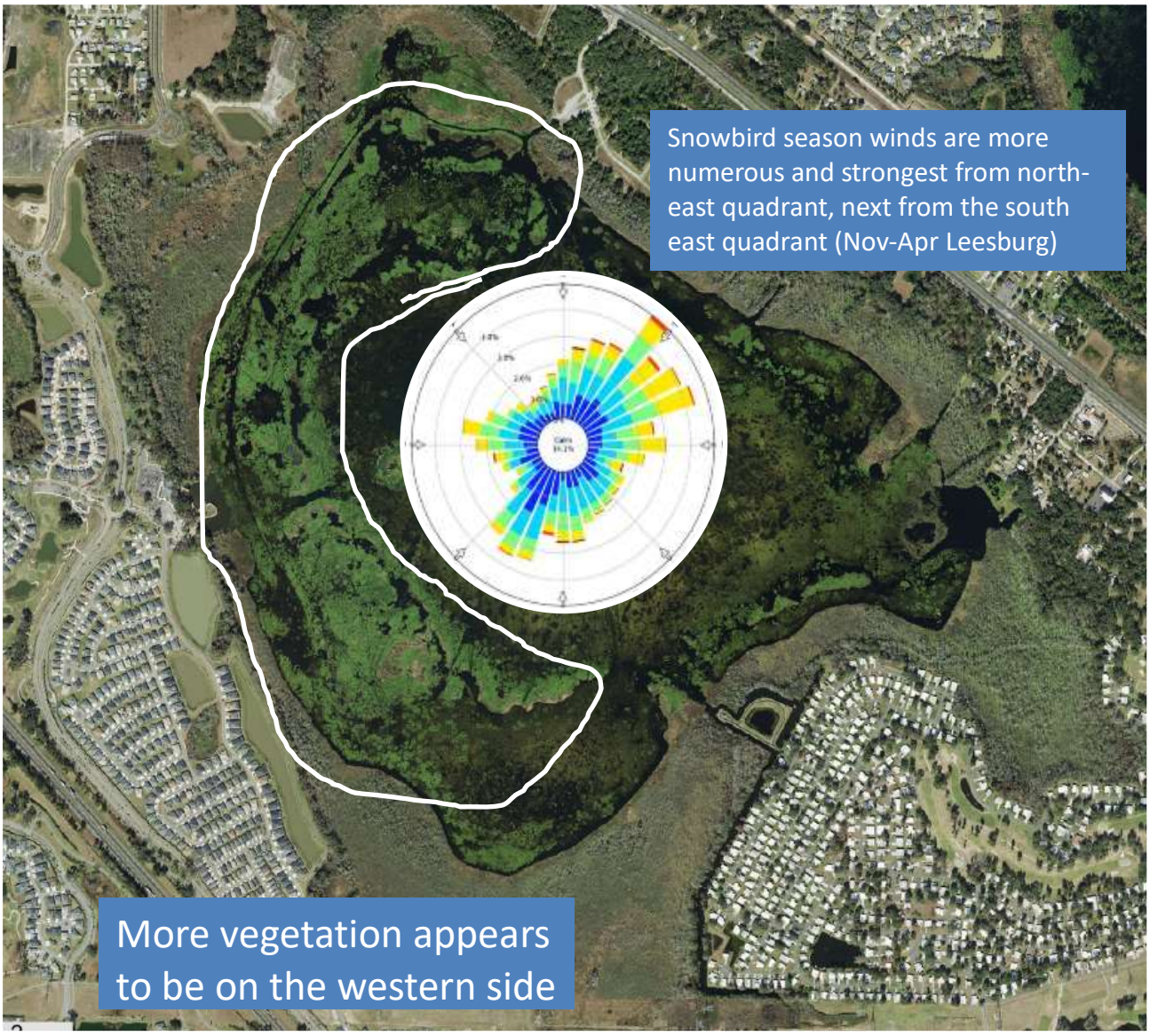
Even so, there are enough west winds during the period to blow tussocks in our direction. Another large tussock and a few small tussocks approached in January, but did not come close enough to block the inlet. A small tussock was subsequently blown into and out from the inlet repeatedly in March and April.





The below figure shows the wind rose pertaining to the November 2023-April 2024 time period imposed on a SWFWMD supplied (T.J. Venning) ‘recent’ view of Lake Okahumpka. This should provide a better idea of how wind direction might influence location of objects in the lake.

It seems that denser vegetation exists on the western side of the lake, likely pushed there by the prevailing wind. I cannot say what this vegetation is, but tussocks and floating islands are certainly present there. This is definitely shown in images elsewhere in this report.



RECENT DRONE IMAGERY OF LAKE OKAHUMPKA

See southeast looking view of Lake Okahumpka. CCC is in the distance. Floating vegetation is everywhere on the lake, but note the pattern of increased vegetation closer to the western side of the lake

The below closer look brings definition to the many floating islands and other floating or bottom growth to the surface such as Hydrilla. This image might be showing the difference betweeen Tussocks (floating rafts of plants) and floating islands consistent with the Univ. of FL. definitions above.

The above snips are from Papa Pineapples video with permission.
https://www.youtube.com/watch?v=bQO9o-ikvlo&t=174s

The Villages also have a problem with tussocks.

Tussocks have "Quietly invaded the Villages Lake Okahumpka Activities Center" per Richard Burr May 1, 2024 Discussion Group. Our residents are wise and inquiring.

This activity center and pier are directly across the lake, on the western side, and can be seen from the CCC gazebo point. Some of the plants identified in this group of small tussocks are Sweetscent, Rose Meadowsweet, Japanese Spiraea, Common Rush, and Common Reed. These were identified using the "Picture this" app on my smartphone, taking a picture of the images posted by Richard Burr on the Discussion Group.

Summary:
This report has, for the moment, somewhat satisfied my curiosity brought by the Dec 2023 events. If anyone wishes to add to this, or if you find errors, please respond. I would also appreciate comments as to conditions of the vegetation from residents who actually have boated on the lake. Thanks, Dan Kane.

References

1) Univ. of FL, https://plants.ifas.ufl.edu/manage/why-manage-plants/tussocks-and-floating-islands/
2) SWFWMD, https://www.swfwmd.state.fl.us/
3) https://mesonet.agron.iastate.edu/sites/windrose.phtml?station=LEE&network=FL_ASOS