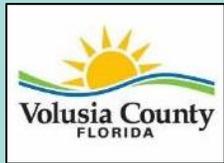


# Engaging residents as citizen scientists for dune monitoring of newly restored dunes in Flagler County

**UF** | IFAS Extension  
UNIVERSITY of FLORIDA



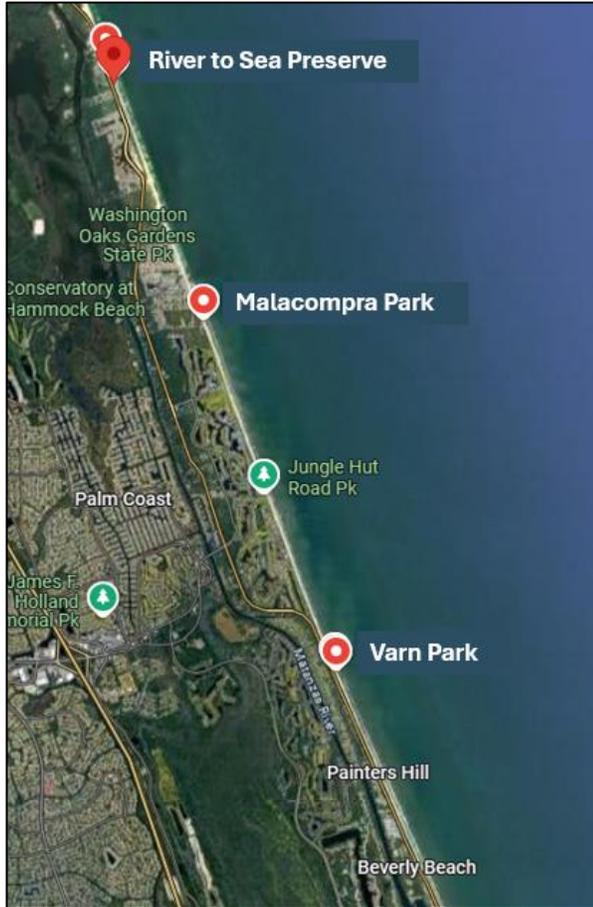
CAROLYN KOVACS

UF/IFAS EXTENSION FLAGLER AND VOLUSIA COUNTIES

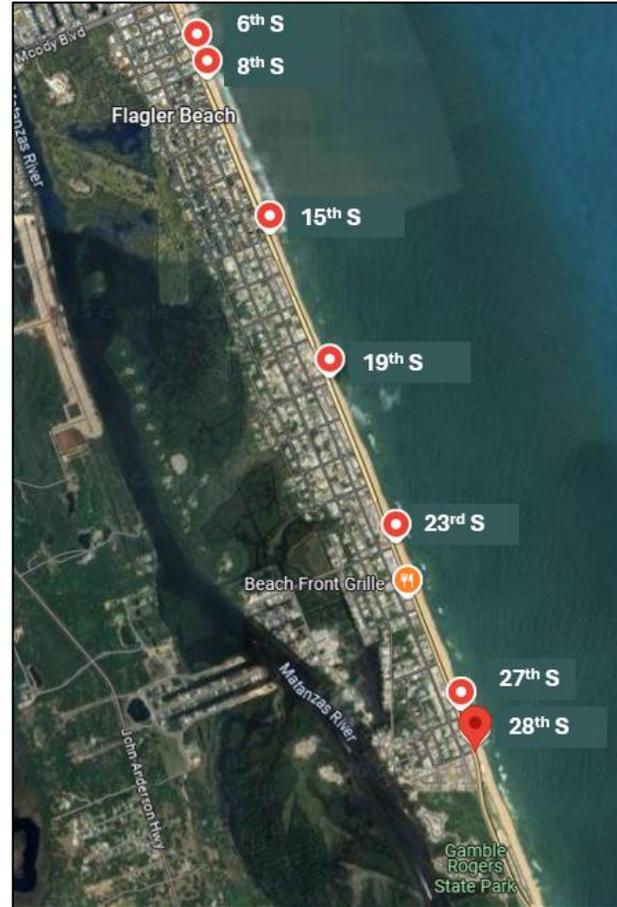
# Background



# Background



Dune projects 2023-2024  
Northern Flagler



Beach nourishment 2024  
Flagler Beach



Sea oats on recently planted dune  
(beach nourishment) in Flagler Beach

# Objectives

## Develop a citizen science dune monitoring program in Flagler County

- Engage with residents to increase knowledge of and connection to dunes
- Train residents who conduct monthly surveys at dune walkovers
- Provide data to county government to help inform and improve current and future dune nourishment and planting projects



# Methods: Education and training

- Public presentations on dune ecology and plant identification
- Training of interested volunteers
  - Classroom and on beach training of plant ID and data collection methods



Sea oats  
*Uniola paniculata*



Sea oats  
Close up on leaves



Bitter panicgrass  
*Panicum amarum*



Seashore dropseed  
*Sporobolus virginicus*



Saltmeadow cordgrass  
*Spartina patens*



Beach elder  
*Iva imbricata*



Railroad vine  
*Ipomea pes-caprae*

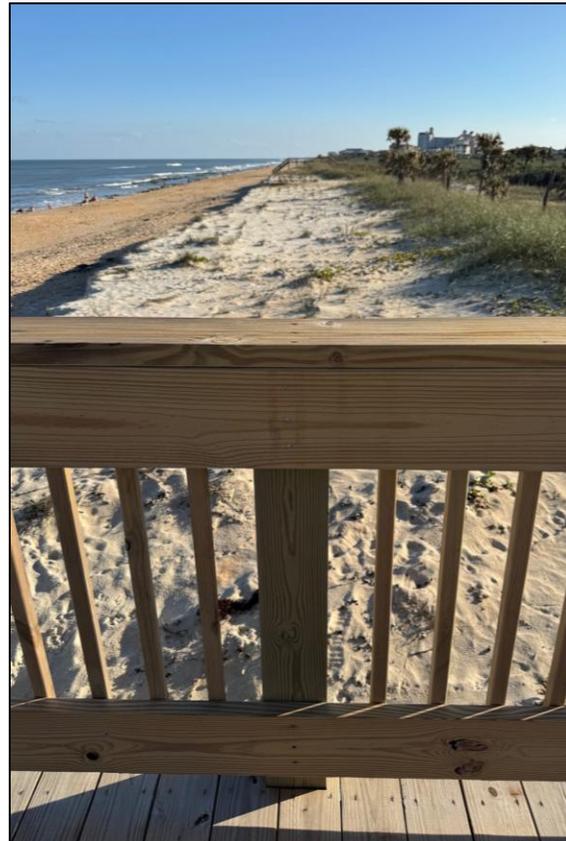
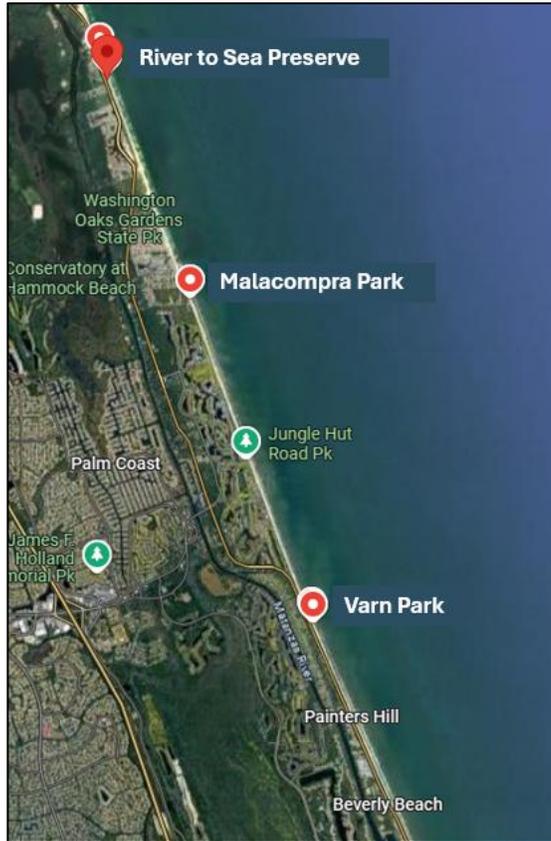


Railroad vine  
Non-blooming



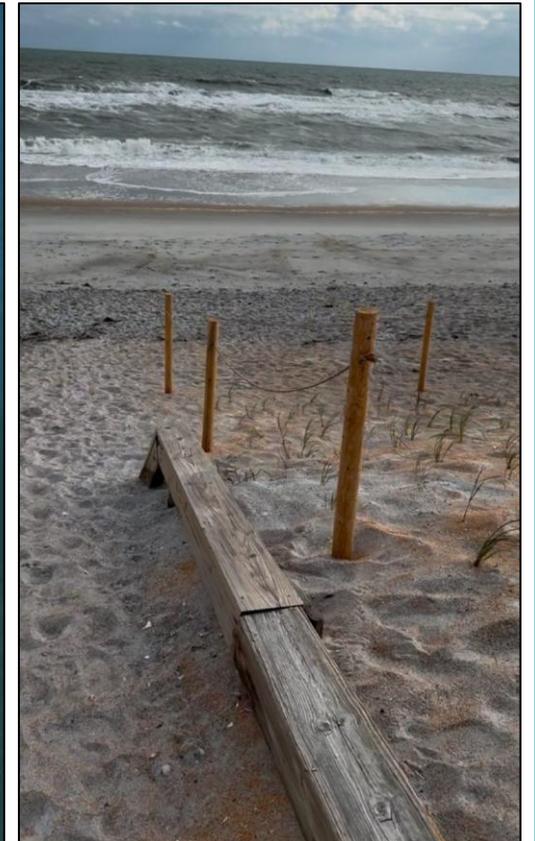
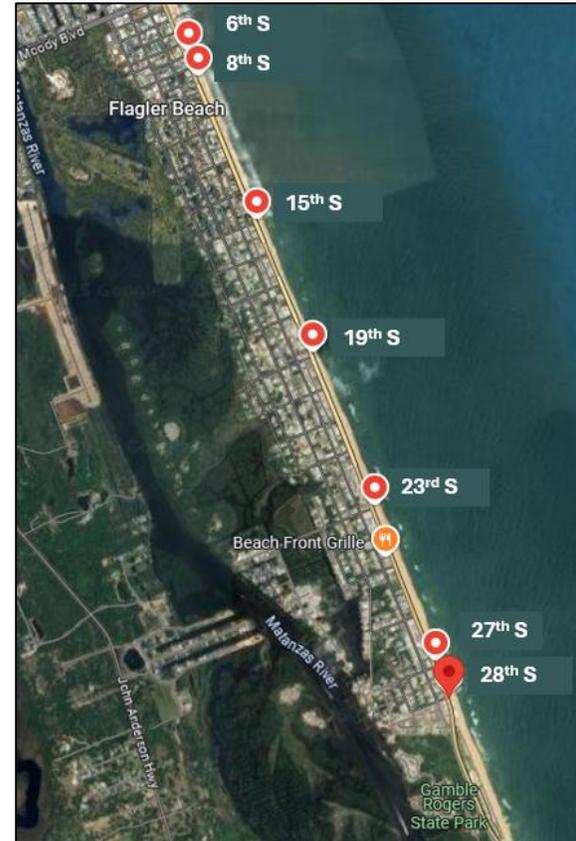
Dune sunflower  
*Helianthus debilis*

# Methods: Sites



Dune projects 2023-2024

Northern Flagler



Beach nourishment 2024

Flagler Beach

# Methods: Monthly monitoring

- Qualitative data (plant species, disturbances)
- Scarp measurements (height and distance)
- Photos from set points (fence or walkover posts)
- Non-invasive



# Methods: Survey123

- Data collection using Survey123
- Survey built using ArcGIS
- Volunteers submit data using an app on their phone

The screenshot shows the Survey123 mobile app interface for a form titled "Dune monitoring form". The form contains several fields and instructions:

- Your name(s) \***: A text input field containing "Carolyn".
- Date of data collection \***: A date picker field showing "Thursday, January 29, 2026".
- Monitoring site \***: A dropdown menu showing "FB15S - Flagler Beach 15th St South".
- Mark your location on the map \***: A section with instructions: "Click the circle icon to automatically mark your location in the app (please ensure your settings allow for the app to use your location - if not, you can mark the location manually on the map)". Below the text are two icons: a location pin and a map outline.
- Species observed in the planted dune area \***: A section with a detailed instruction: "Record the species observed in the planted area to both the north and south as visible on the walkover. This includes the new sea oats and bitter panicum that were planted in the area, as well as any plants that have established themselves in the planted area on their own. It does not include plants growing behind the planted area in an older dune." Below this are four checkboxes:
  - Sea oats
  - Bitter panicum
  - Railroad vine
  - Seacoast marshelder

# Flagler Beach

8<sup>th</sup> Street  
South



March

June

September

December



# Overall plant growth and appearance

## Flagler Beach sites:

- Sea oats had high survivorship
- Monthly growth, with greatest increase observed in summer months (June through end of Aug)
- Notice color change in fall as transition from growing to dormant winter season



# Site comparisons and patterns

Sea oats appear less dense/smaller at the furthest south sites.

- South end planted first then a storm came through that resulted in strong winds.
- Growth may have been stunted by harsh conditions right after planting?



27<sup>th</sup> St South versus 8<sup>th</sup> St South, Flagler Beach (September 2025)

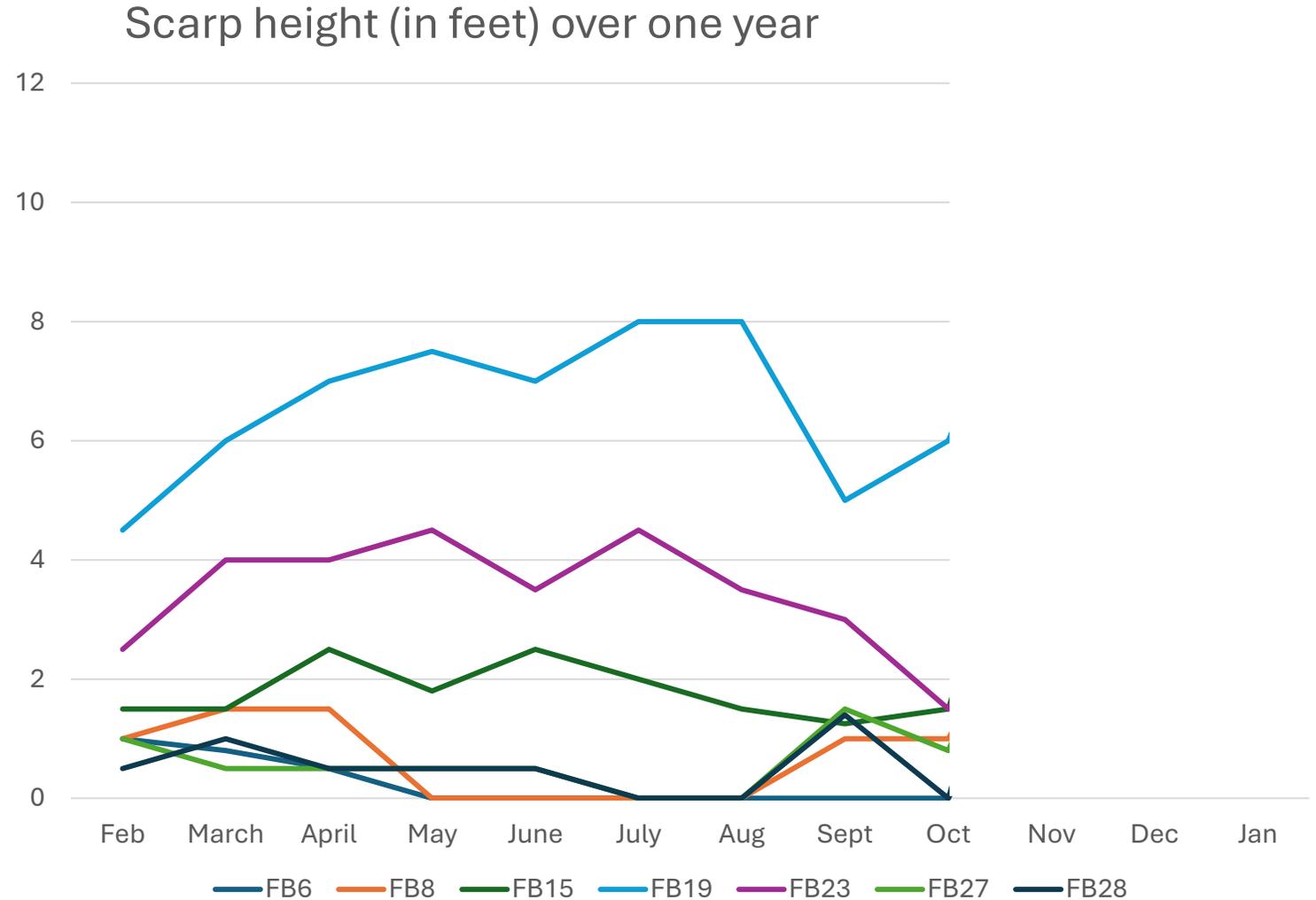
# Site comparisons and patterns

- Lower plant survival in northern beaches (dune only) vs Flagler Beach (nourishment + dune)
  - Many environmental differences to tease apart
  - Sand source?
  - The importance of roping off planted areas where there is foot traffic!



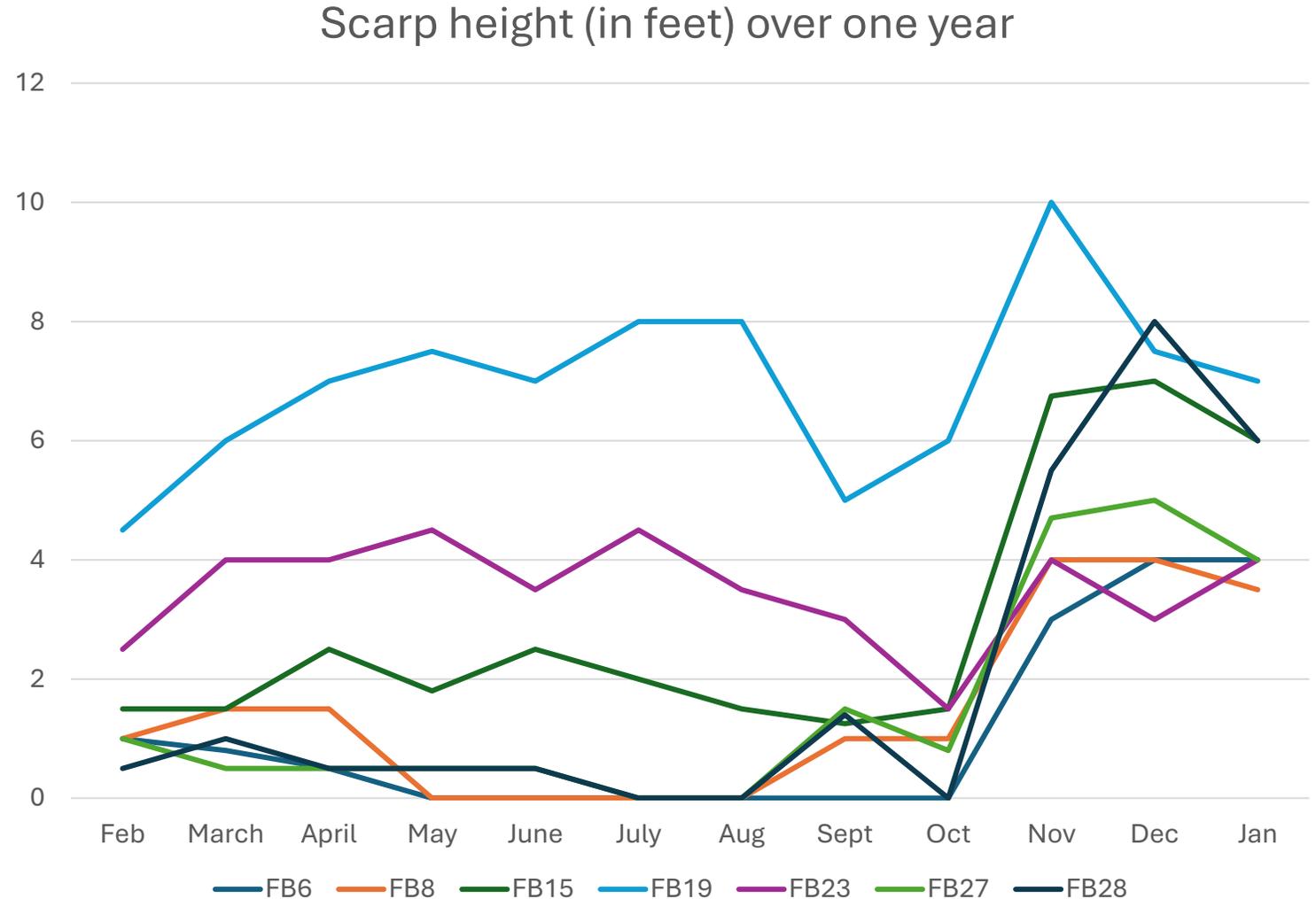
# Scarp Height:

- From Feb-Sept, the greatest scarp height and presumed erosion were noted around 19th Street S.
- Scarps remained constant and some accretion even took place...



# Scarp Height:

- From Feb-Sept, the greatest scarp height and presumed erosion were noted around 19th Street S.
- Scarps remained constant and some accretion even took place until nor'easter + king tide event in October 2025  
→ 4-6 foot scarps at most sites



# Scarps

- New scarps formed after October nor'easter
- Added side angle of scarp images to data collection



27<sup>th</sup> Street in September (above)  
and November (below)



# Flagler Beach

## 15<sup>th</sup> Street South



**March**



**September**

New scarps  
formed after  
October  
nor'easter



**November**



**January**

# Program Impacts

- Volunteers have collected one year of continuous data
  - 360 volunteer hours = value of \$11,880
- Images, graphs, and site summaries were compiled for an 8-month report in October and shared with Flagler County Coastal Management
  - Images and data supported ACOE post-storm assessments
  - Data will hopefully help inform future projects



Flagler Beach - 19<sup>th</sup> St South  
Lower marker facing south- February-September 2025

Flagler Beach - 23<sup>rd</sup> St South



# Program Impacts

- Over 100 individuals have attended educational presentations
- Data was presented to volunteers along with continuing education
- Volunteers reported a
  - 52% increase in their ability to identify the plants that live on the sand dunes
  - 59% increase in their ability to conduct monitoring of a coastal sand dune
  - 14% increase in their understanding of the importance of dune habitats to humans and wildlife



The screenshot shows a blog post from UF IFAS. The header includes the UF IFAS logo and navigation links for Agriculture, Natural Resources, Home Landscapes, Work & Life, 4-H & Youth, and What's New. The article title is "Ten Plants to Know in our Florida Sand Dunes" by Carlyn Kovacs. The text discusses the importance of coastal sand dunes and lists ten plants. A photo of sea oats is shown, with a caption explaining their role in stabilizing dunes. A QR code is located in the bottom right corner of the screenshot.

**UF IFAS Blogs**

Agriculture | Natural Resources | Home Landscapes | Work & Life | 4-H & Youth | What's New

Home » UF IFAS Extension Flagler County » Ten Plants To Know In Our Florida Sand Dunes

### Ten Plants to Know in our Florida Sand Dunes

Carlyn Kovacs

Our coastal sand dunes are important as they protect our land and buildings from wave energy, erosion, and flooding. They also protect inland habitats and buildings from salt spray and are an important habitat for many plants and animals. Plants are a key component to coastal sand dunes. The leaves of dune plants capture wind-blown sand, helping the dunes grow taller. The deep roots of dune plants then act as a network to hold the sand in place, stabilizing our sand dunes.

It takes special types of plants to survive the harsh conditions of sand dunes. They must be able to tolerate salt spray, high temperatures, and low soil moisture. Sea oats are one of the most important dune plants, but our dunes are comprised of many species including railroad vine, panic grass, and sea palmfruits. Keep reading to learn about ten important species that make up our sand dunes in coastal Florida!

**1. Sea oats**



**Sea oats** (*Uniola paniculata*) are one of the most important and well-known dune plants in Florida. They assist with the dunes as the tall leaves trap wind-blown sand and the deep roots and rhizomes stabilize them. The leaf portion of the plant is tall, but the central stem with the inflorescence of sea oats can stand at 5 to 8 feet. The seeds turn a golden brown in 1 year and are a food source for wildlife in the dunes, including beach mice. Sea oats are protected by law in Florida, and you cannot cut or remove them from public beaches.

# Challenges

- Developing standardized methods when each site is different
  - Storm can alter the site
  - Where to measure the scarp from (best practice / feasibility)
- Data management: images have to be downloaded individually from Survey123 and organized manually (labor intensive)
  - If anyone has ideas for other methods or programs, please let me know!



# Take away messages:

- Look at monitoring of nourishment and planting projects as opportunities to learn and improve future projects
- Residents want to learn and help – trained volunteers can greatly increase our capacity to monitor projects



# Thank you!



Contact: [c.kovacs@ufl.edu](mailto:c.kovacs@ufl.edu)

