CONSERVANCY OF SOUTHWEST FLORIDA

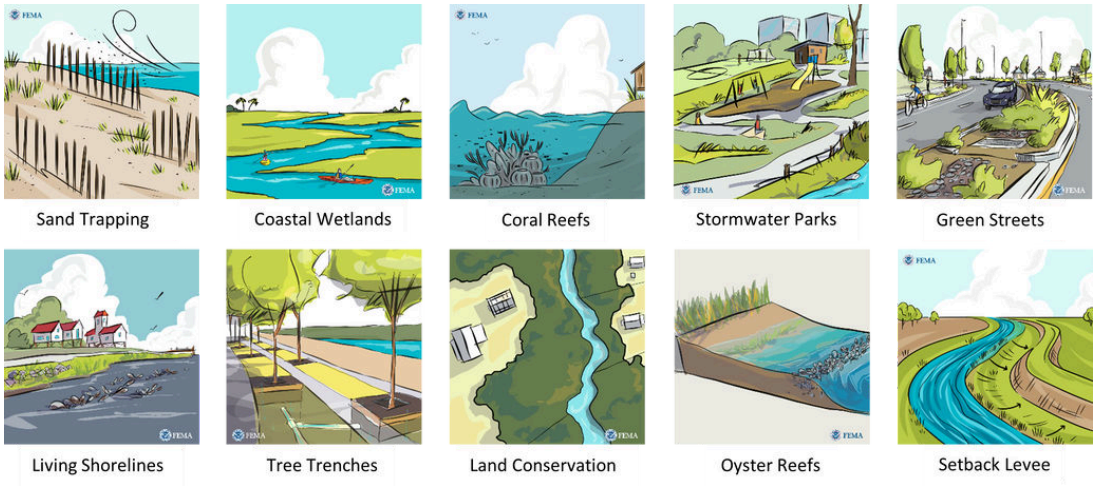
climate corner

by Carrie Schuman, Ph.D., Climate Resilience Advisor

In the Throes of Summer

Happy summer to our members and readers! This issue of Climate Corner shares some of our recent efforts profiling case studies of nature-based and hybrid solutions for issues like flooding. We highlight a recent wetlands loss news article that cites Conservancy work. There is an explainer on how El Niño and La Niña are part of shaping our hurricane seasons. Finally, we also feature our standard sections highlighting climate stories of interest and upcoming sustainability and climate events. Events this cycle include some great trainings from the Rookery Bay National Estuarine Research Reserve's Coastal Training Program, some upcoming Resilience conferences, CREW lectures, and more.

Check Out These Nature-based and Hybrid Solution Case Studies!



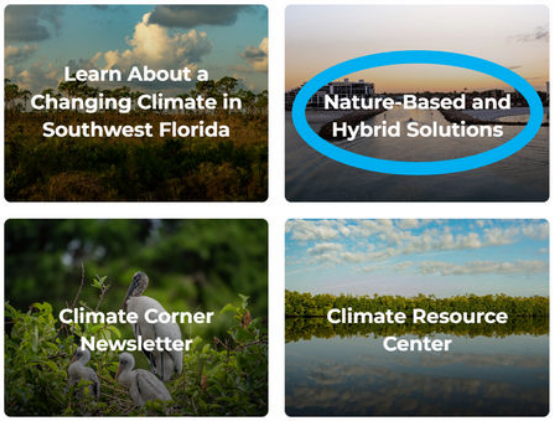
Examples of Nature-based solutions, Image Credit: FEMA

In our last climate corner issue (Spring 2025), we noted we've been developing resources as part of our follow-up work after holding the Working with Nature: Nature-Based and Hybrid Solutions for Resilient Communities event last December. This includes a series of fact sheets profiling case studies of implemented projects around the state that address a variety of challenges including those posed by a changing climate, such as increased flooding, erosion, water quality degradation, etc. We also included a preview of two of the fact sheets. We've made a lot of progress since then and are ready to release our inaugural batch of case studies.

Here are our starting case studies:

- Naples Botanical Garden Stormwater Treatment System, Naples, FL
- Naples Botanical Garden Resilient Beach Dune Planting, Naples, FL
- Good Neighbor Stormwater Park, North Miami, FL
- Stewart Middle School Living Shoreline, Tampa, FL
- Dinner Key Marina Resilience, Miami, FL
- Joe Rains Beach Living Shoreline, Cedar Key, FL
- G Street and Airport Road Living Shorelines, Cedar Key, FL
- Sweetwater Wetlands (water treatment), Gainesville, FL
- South Cove Natural Area (constructed island), West Palm Beach, FL

You can click on the hyperlinked text above to download copies of each fact sheet. These fact sheets are also available on the newly reorganized Conservancy climate and resilience website. Just click on the tile for "Nature-based Solutions." Scroll down until you see the heading for "Case Studies" and click on the "Fact Sheets" tab.



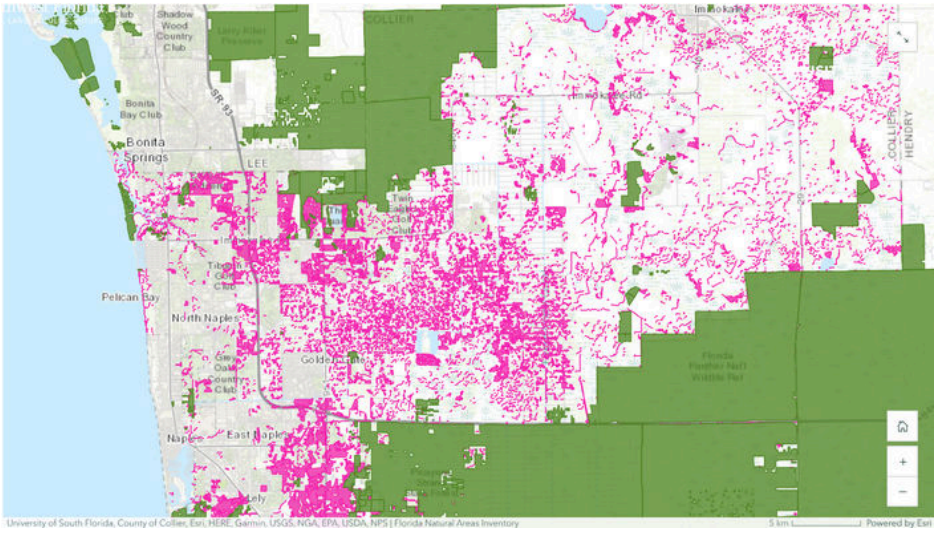
We will continue to expand this library of case studies, and already have multiple profiles of additional projects in the works for future upcoming release, including in our Fall Climate Corner. You can also expect all these examples to be incorporated into a forthcoming GIS story map, which will include bigger-picture storytelling around the Conservancy's work, why nature-based solutions are crucial to our adaptation, and what strategies Florida communities are employing.

While there are other resources that provide or incorporate example Florida-based nature-based and hybrid case studies, the maintenance of our tools as a "living library," the level of detail provided, and the diversity of types of projects we are highlighting across the state sets our work apart. We hope to help our local community continue to understand what balanced adaptation to challenges like flooding looks like, and to share the ideas, successes, and lessons learned from other communities navigating similar pathways.

Conservancy Work Featured in Wetland Loss Story

Local environmental reporter Amy Bennett-William's recently penned the well-written but sobering article: "'Liquid gold' draining away as Naples, Fort Myers areas lose more wetlands each year." In it, Bennett-Williams paints a picture not only of wetland loss especially due to development but also of the paramount importance of these systems for our local wellbeing, including for building local resilience, as highlighted in the following excerpt:

Bennett-Williams also highlights a StoryMap, titled "Wetlands Loss - Collier and Lee Counties", recently released by the Conservancy and which provides the loss statistics mentioned in the piece. The website was created by Senior Environmental Planning Specialist Julianne Thomas, and also features a Liquid Gold infographic, brainchild of Senior Environmental Policy Advisor Amber Crooks with design support from our Marketing team. Sliders are included that show the stark contrast between decades prior, where more natural lands abound, and current day development footprints. Thomas and Crooks also share their insights around wetland loss in quotes contained in the article.



Map showing wetland loss in Collier County between 1999 and 2023. The pink layer shows the 22,796 acres of wetlands that existed in 1999 that were no longer considered wetlands by the South Florida Water Management District in 2023. This is a loss of 17% of wetlands in 24 years.

For those with subscriptions, the article can be accessed on the Naples Daily News and the News-Press websites. For those without, both websites likely allow a certain number of free article reads per month, so you may still be able to access the piece. If you want to learn more about why you should care about wetlands in general, check out the Conservancy's Liquid Gold handout.

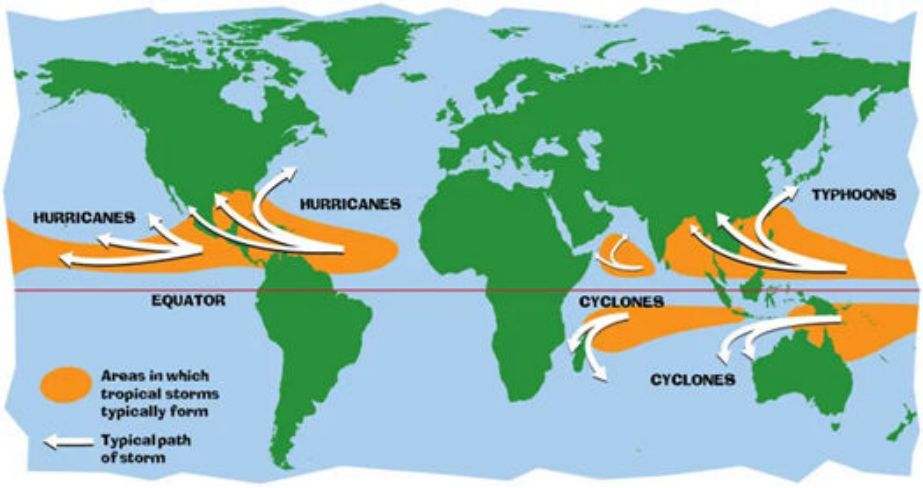
Explainer: Demystifying the Role El Niño and La Niña Play During Hurricane Seasons

There are markers of particular times of year for Floridians – the drifting by of paired love bugs, the mass return or exodus of snow birds, and the appearance of winter clothes at the hint of cooler temperatures.

Among these are the release of yearly predictions for hurricane season and the creative list of possible monikers. At the same time, there is generally a lot of chatter on local news channels about what's contributing to those seasonal forecasts, including the influence of El Niño and La Niña. In the following explainer, we help shed light on the ways these two complementary phases of a larger cyclical pattern modify expectations around hurricane seasons.

A Recipe for Hurricanes

First, it might be helpful to establish that there is a mixture of certain key ingredients, or favorable conditions, that contribute to the formation of hurricanes and their likelihood to be sustained for a period of time. Surface ocean waters must be about 80° F or warmer throughout the top 50 meters (~150 feet) of the water column. These warm ocean waters also need to be paired with warm moist air conditions above which is very typical in tropical, equatorial locations. This heat energy is commonly described as the "fuel" that feeds hurricane formation.



Areas where tropical cyclones tend to form. Tropical cyclones that form in the North Atlantic and the central or eastern North Pacific are alternatively called hurricanes, while those in the Northwest Pacific are called typhoons
Image Credit: NASA Space Splace

In areas of low-pressure disturbances that can form near the equator, warm air will start to rise in the atmosphere. When this warm air mass rises high enough, it will begin to cool, and the moisture it contains will condense and form clouds, contributing to thunderstorm formation. Warm air from surrounding higher-pressure areas will move into the underlying area of low pressure. This both creates wind and continues to fuel the upward movement of air and subsequent cloud formation. The wind that is present will start to rotate due to the earth's rotation, a phenomenon known as "Coriolis force" or the "Coriolis effect." The direction and strength of the effect, especially on weather, differs depending where on the globe a system is developing. Corealis force tends to be very strong near but not at the equator (where it is zero) and will cause the counterclockwise spinning of storms in the northern hemisphere where Florida is located.

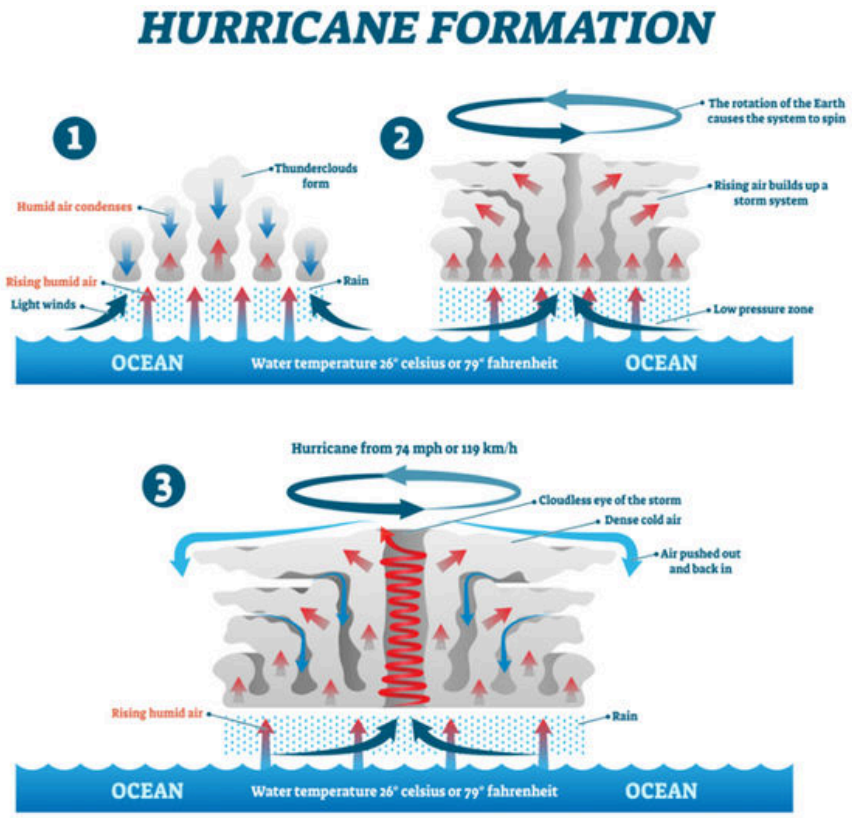


Image Credit: InternetGeograpy.net

Also, in order for hurricanes to persist, winds need to remain very consistent over the entire height of the storm. If there is a lot of wind shear – a word that refers to changes in wind speed and/or direction, then hurricanes will weaken or destabilize. Conditions where wind shear is very minimal can also increase the likelihood of hurricane rapid intensification, a situation where hurricane wind speeds become significantly stronger within 24 hours.

Cycles Just Behind the Scenes

El Niño and La Niña are two phases of a cyclical climatic pattern known fully as the El Niño-Southern Oscillation (ENSO). There are quite a few additional region-specific climate "oscillations" – with names like the North Atlantic Oscillation (NAO), the Pacific Decadal Oscillation (PDO), and the Madden-Julian Oscillation (MJO) – that also contribute to weather events, but ENSO is undoubtedly the most well-known to the general population.

ENSO oscillates between El Niño and La Niña phases and even "neutral" periods where the effects of either phase are not present. Periods of El Niño conditions tend to last for 9-12 months but can on rarer occasions last for two or more years. La Niña tends to persist for longer, regularly lasting between 1-3 years in length. There is also more likelihood of La Niña double dipping, where two consecutive La Niña periods can occur with a neutral period sandwiched in between.

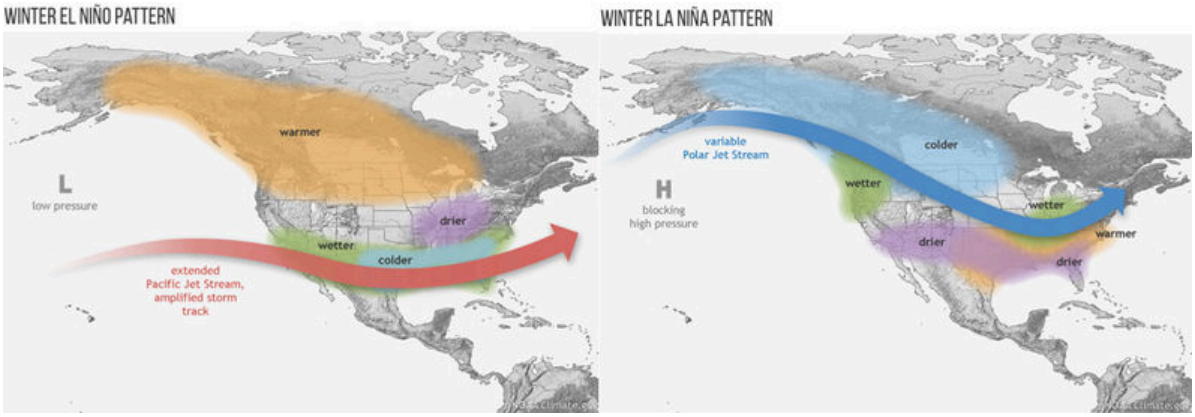
The conditions associated with ENSO's El Niño and La Niña phases vary depending on where you are in the world, within the United States, and even within Florida.

The following table provides a summary of the effects on temperature and precipitation across the Southeast:

Phase	Region	Oct-Dec	Jan- Mar	Apr-Jun	Jul-Sep
El Nino	Peninsular Florida	Wet & cool	Very Wet & cool	Slightly dry	Slightly dry to no impact
	Tri-State Region	Wet	Wet	Slightly wet	No impact
	Western Panhandle	No impact	Wet	Slightly Dry	No impact
	Central and North Ala. & Ga.	No impact	No impact	No impact	Slightly Dry
La Niña	Peninsular Florida	Dry & slightly warm	Very dry & warm	Slightly wet	Slightly cool
	Tri-State Region	Slighly dry	Dry	Dry	No impact
	Western Panhandle	Slightly dry	Dry	Dry	No impact
	Central and North Ala. & Ga.	Dry	Dry in the south, wet in NW Ala.	No impact	Wet in NW Ala.
Neutral	All Regions	No impact	No impact	No impact	No impact

Table Credit: Florida State University, Florida Climate Center

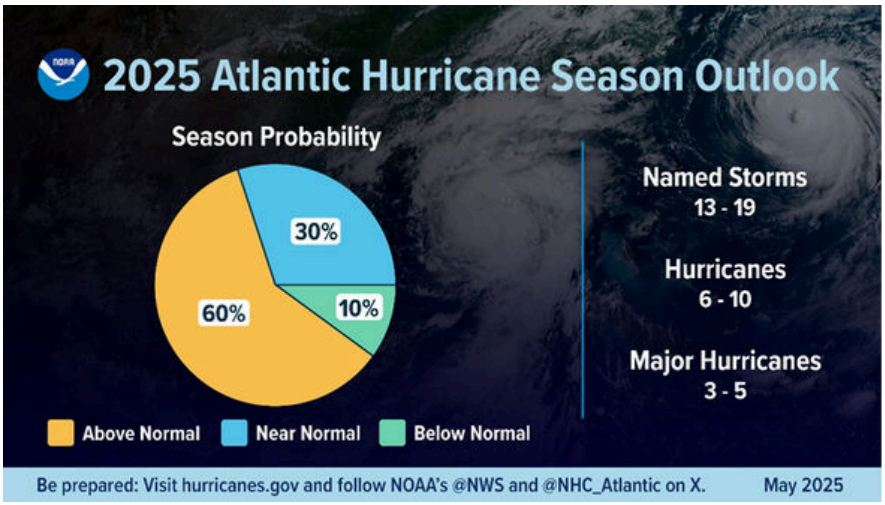
But, more generally for the state, an El Niño phase is often associated with wetter, cooler winters. This can mean increased flooding from regular heavy rain events; however, El Niño is also associated with increased wind shear during hurricane season which is less favorable for their formation. La Niña is especially associated with dryer, drought-conducive conditions in the Southeastern US, but lower wind shear often resulting in "above-average" hurricane seasons. ENSO-neutral periods should lead to hurricane seasons that are more "average" in nature. However, other local factors may become more important during these periods.

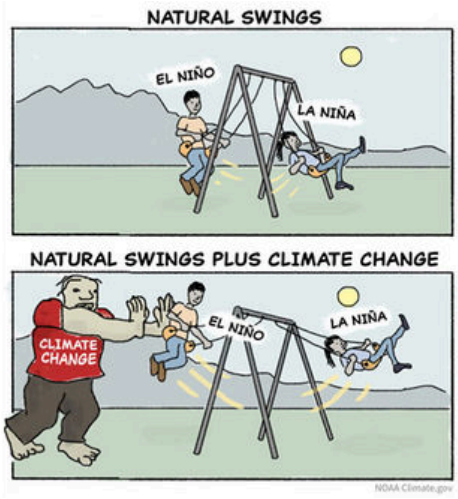


Typical US winter conditions associated with El Niño and La Niña,
Image Credit: NOAA, Climate.Gov

Future ENSO Influence

For the upcoming 2025 season which is occurring during [ENSO-neutral conditions], [NOAA National Weather Service forecasting] is suggesting a 60% chance for an above average season.





Upcoming hurricane season outlook, and a graphic depicting the way a changing climate may enhance extremes in the shifts between El Niño and La Niña, Image Credits: NOAA's National Weather Service, Climate.Gov

While this is due to multiple factors, one influence is above-average sea surface temperatures including [the record-breaking ones that have occurred in many regions of the world] over recent summers. As established earlier, they are a key element for hurricane formation and may, at times, outshine other ENSO influences on hurricanes. Also, while scientific researchers [are still exploring] whether a changing climate is recognizable in historical and recent ENSO patterns, [some] [studies] do seem to suggest that the intensity and frequency of ENSO phases [have increased] since human industrialization, and that, into the future, we [can expect] continued extreme shifts.

Continue to Explore:

- NOAA Scijinks: How Does a Hurricane Form?
- NOAA's Ocean Today Hurricane Safe webpage. Watch a series of 8 short videos on hurricane formation, impacts, and safety.
- NOAA's National Weather Service Jetstream webpage on the Origin of Wind, which describes high and low pressure systems and the influence of Coriolis force
- Scientific American: Meet Wind Shear, the Phenomenon That Can Rip a Hurricane Apart
- Climate Central: Hurricane Rapid Intensification
- Double-dipping: Why does La Niña often occur in consecutive winters?
- Oscillations and Wild Weather Years Can't Mask Climate Change
- New study helps solve a 30-year-old puzzle: how is climate change affecting El Niño and La Niña?
- El Niño battled warm ocean temperatures during the above average 2023 hurricane season

Climate Stories of Interest

- The unseen flooding risk in South Florida: Rising water beneath our feet, Miami Herald
- Severe storms bring 1-in-1000-year rain event to Tampa Bay, WFLA News Channel 8
- 'Ticking timebomb': sea acidity has reached critical levels, threatening entire ecosystems – study, The Guardian
- Hurricane season is here, but FEMA's policy change could leave low-income areas less protected, The Conversation
- What Floridians can learn from Hurricane Ian recovery on Fort Myers Beach nearly three years later, WGCU
- Defense Department will stop providing crucial satellite weather data, NPR
- China is moving much faster on electric cars than the EU or the United States, Our World in Data
- Floods are getting more dangerous around the country, not just in Texas, WGCU
- How Secret Flood Histories Cost Florida Home Buyers and Mask State's Risk, Miami Herald (note: this year's and last year's state legislative sessions saw the passing of two similar laws requiring increased flood disclosure for sale and rental of properties)
- Natural defenses: UF researchers use living infrastructure to protect Florida's shores, UF News
- New tool could help Florida homeowners weather flood risks, lower insurance costs, UF News

Upcoming Climate, Resilience, & Sustainability Events

Events are not officially endorsed by the Conservancy but may be of interest to our membership.

Click here to explore listings for upcoming climate, resilience, and general sustainability events. There are lots of listings this cycle, including more for conferences, lectures, trainings, and more.