Why South Florida Is So Wet This Winter

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South Florida is supposed to be in its dry season. Instead, streets are flooding, canals are running high and drainage built for a lower sea is struggling to keep up. The cause is a chain of events that starts thousands of miles away in the tropical Pacific. A near-record El Niño has pulled the winter jet stream, the high-altitude wind that steers storms, south over Florida, sending a steady line of Gulf storms across the peninsula. When those storms meet strong high pressure to the north, the squeeze drives days of east wind that pile rain and seawater onto the Atlantic coast. The ocean was already running high. Fall is king tide season. Unusually warm water off the east coast, which expands as it heats, has likely pushed the sea higher still. Beneath it all sits about 8 inches of sea level rise since 1950. That same warm water is giving the wind even more moisture to deliver.[1]

A Record-Class El Niño

NOAA's Climate Prediction Center (CPC) has declared an El Niño and gives it a better than 79% chance of staying strong to very strong through March 2027. Its November update has surface water in the central tropical Pacific running about 4.5°F (2.5°C) above normal. CPC puts the odds that this becomes the strongest El Niño since 1950 at about 60% for this fall and early winter.[2]

For scale, the two benchmark events, 1997–98 and 2015–16, each peaked at roughly 4.3 to 4.7°F (2.4 to 2.6°C) above normal (per CPC's ONI record).[3] This event has not yet peaked. The National Weather Service office in Miami (NWS Miami) says it "could match or exceed the historic 1997–1998 event as the strongest recorded since 1950."[4] *Strongest on record* is still a forecast, not a fact.

Why El Niño Happens

El Niño is a periodic warming of the tropical Pacific Ocean that changes wind patterns around the world. Once it starts, it feeds itself.

Why "El Niño" and "La Niña"? Fishermen on the coast of Peru noticed that every few years a warm current arrived around Christmas and their catch dropped. They called it El Niño, "the boy," after the Christ child. Scientists later took the name for the whole Pacific warm phase. Its cool opposite, with stronger trade winds and colder water in the eastern Pacific, became widely known in the 1980s as La Niña, "the girl."[5]

1. **Normal State.** Trade winds blow east to west along the equator, pushing warm surface water toward Indonesia and piling up a deep warm pool. Cold water rises from the deep ocean off South America. The temperature contrast keeps the trades blowing. *See Figure 1 on the next page.*
2. **The Trigger.** Bursts of westerly wind in the western Pacific weaken the trades. The warm pool sloshes back east along the equator.

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[1] Associated Press, "Soaking storms shift north to Florida's Space Coast and prompt water rescues," via NBC News (Nov. 20, 2026). https://www.nbcnews.com/weather/floods/soaking-storms-shift-north-florida-space-coast-california-rcna610368

[2] NOAA Climate Prediction Center, ENSO Diagnostic Discussion (Nov. 12, 2026). https://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_disc_nov2026/ensodisc.shtml

[3] NOAA Climate Prediction Center, Oceanic Niño Index (ONI), Historical El Niño / La Niña Episodes, 1950–present (accessed Nov. 18, 2026). https://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso/oni/v6/

[4] WSVN 7News, "Super El Niño" (Nov. 4, 2026). https://wsvn.com/news/local/miami-dade/super-el-nino-florida-winter/

[5] NOAA, El Niño and La Niña, NOAA Education resource collection: origin of the name, Peruvian fishermen, Christmas timing. https://www.noaa.gov/education/resource-collections/weather-atmosphere/el-nino On La Niña's naming in the 1980s: The Hill / Nexstar Media Wire, "Where do El Niño and La Niña get their names?" (citing NOAA). https://thehill.com/homenews/nexstar_media_wire/3958308-where-do-el-nino-and-la-nina-get-their-names/

3. **The Feedback.** A warmer eastern Pacific weakens the trade winds further, which lets more warm water move east. Each step reinforces the next.
4. **Global Reach.** The biggest tropical thunderstorms follow the warm water east. That shift reshapes the high-altitude winds thousands of miles away, including over Florida.

A strong event needs a large amount of warm water to start with. Why this year's event is so strong, including any role of long-term ocean warming, is a research question this paper does not settle.

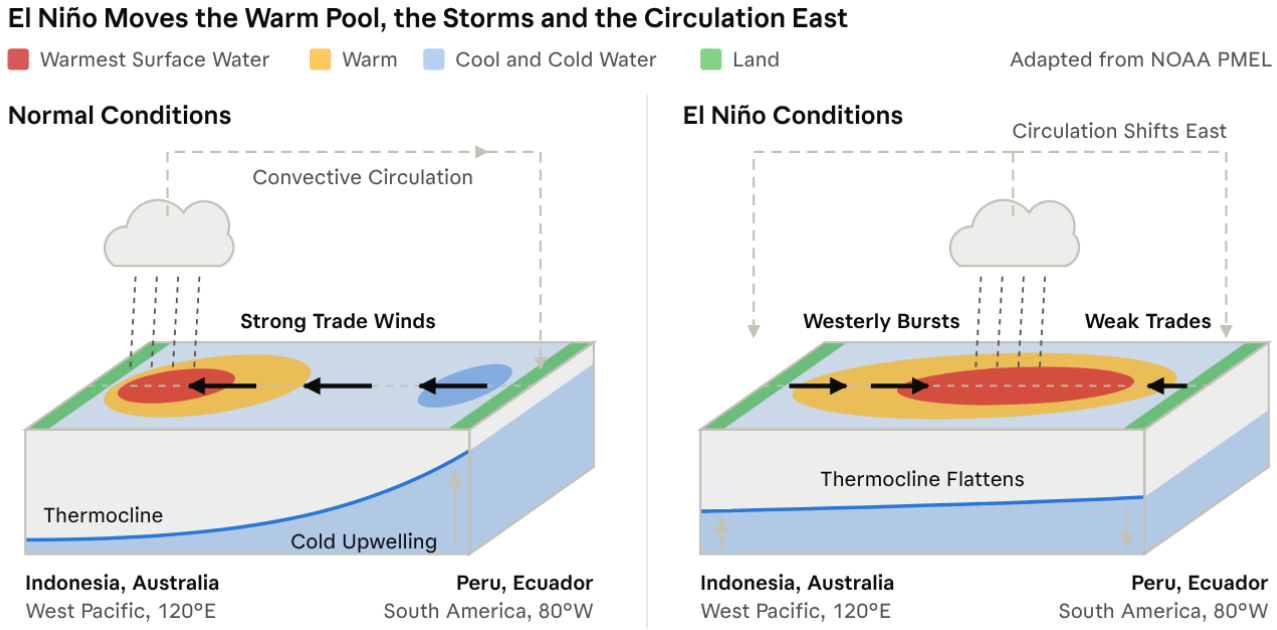

Figure 1. How El Niño develops. The **thermocline** is the boundary between warm surface water and the cold, deep ocean below. In a normal year, strong easterly trade winds push warm water west toward Indonesia and Australia. The thermocline sits deep in the west and rises close to the surface off Peru and Ecuador, where **upwelling** brings cold, nutrient-rich water up from below and keeps the eastern Pacific cool. In an El Niño year, the trades weaken and bursts of westerly wind push the warm pool east. The thermocline flattens, upwelling weakens and the eastern Pacific warms. Rising air and heavy rain follow the warm water east, which shifts the atmospheric circulation and, with it, the winter jet stream over North America. Image adapted from NOAA PMEL.[6]

The Flow Shifts South

In an El Niño winter, the jet stream strengthens and dips south across the southern United States. Florida sits under it. That jet acts as a storm track: it carries Pacific energy east, spins up storms in the Gulf, and drags them across the peninsula.[7]

[6] NOAA Pacific Marine Environmental Laboratory (PMEL), "What Is El Niño?" El Niño Page. https://www.pmel.noaa.gov/elnino/what-is-el-nino/
[7] The Weather Channel, Why parts of Florida are flooding during the dry season (Nov. 18, 2026). https://weather.com/2026/11/18/news/weather/florida-flood-forecast-dry-season

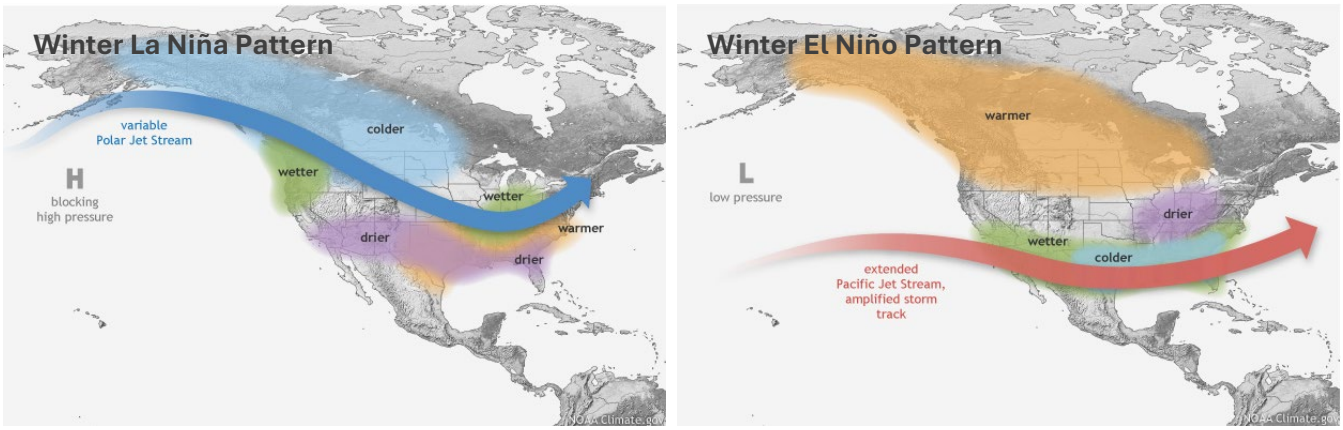

Figure 2. In an El Niño winter (left), low pressure in the North Pacific stretches the Pacific jet stream across the southern U.S. That strengthened storm track brings wetter, cooler weather to Florida and the Gulf Coast and a milder winter to the northern states. In a La Niña winter (right), high pressure in the North Pacific pushes a wavier polar jet stream north, leaving Florida and the rest of the South warmer and drier. Image from NOAA Climate.gov archive.[8]

The result is a dry season that behaves more like a wet season. NWS Miami found 9 to 16 extra rainy days in past strong El Niño dry seasons, and CPC gives a 60 to 70% chance of above-normal rainfall for January to March. The same jet also helps storms rotate. NWS Miami reports 46% more tornadoes in El Niño dry seasons than in La Niña ones, and twice as many strong tornadoes (EF2 or higher).[9]

The East Wind

This is the local piece that turns a wet pattern into flooding on the Atlantic coast. Winter high pressure builds north of Florida. When a Gulf storm or a stalled weather front sits to the south, the pressure difference between the two drives strong, persistent winds off the Atlantic from the northeast and east.

- **More moisture.** The wind crosses hundreds of miles of warm Atlantic and Gulf Stream water before it reaches land, loading the air with moisture.
- **Coastal convergence.** Air slows as it hits land and piles up along the coast. With nowhere else to go, it rises, so showers form right over the coastal cities and repeat over the same neighborhoods.
- **Higher water levels.** Onshore wind pushes water toward the coast and holds it there. Higher tides and canal levels leave drainage systems less room to empty, so rain that would normally drain does not.

[8] NOAA Climate.gov, "How El Niño and La Niña Affect the Winter Jet Stream and U.S. Climate." https://www.climate.gov/news-features/featured-images/how-el-ni%C3%B1o-and-la-ni%C3%B1a-affect-winter-jet-stream-and-us-climate
[9] NWS Miami, 2026–27 Dry Season Outlook (Nov. 3, 2026). https://www.weather.gov/media/mfl/news/DrySeasonOutlook_2026PublicRelease.pdf

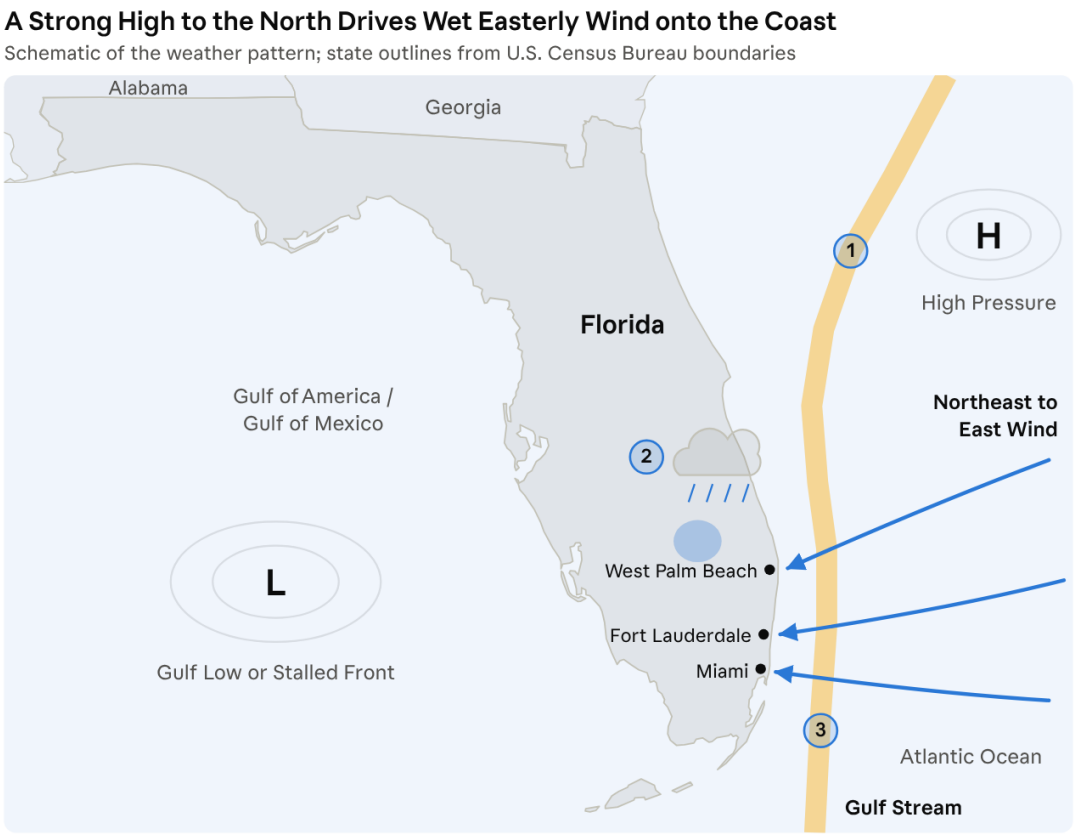

Figure 3. How the easterly wind setup floods the Southeast Florida coast. Strong high pressure to the north and a Gulf low or stalled front to the south **squeeze the air between them**, driving a steady northeast to east wind onto the Atlantic coast. (1) Moisture: on its way in, the wind crosses the warm Gulf Stream and picks up moisture. (2) Coastal convergence: when it reaches land, friction slows the air and it piles up along the coast. The rising air builds showers that repeat over the same neighborhoods. (3) Water levels: the same onshore wind pushes water toward the coast and holds tides and canal levels up, so drainage systems have less room to discharge the rain. Weather features are shown schematically.

The week of November 16, 2026, put the pattern on display. Forecasters described a strong high to the north, persistent northeast winds, gusts near 35 mph on the central coast, and totals up to 6 inches in parts of Miami-Dade, Broward and Palm Beach, with more than 12 inches possible on the northeast coast.[10] In Broward County, gauges caught nearly three times the 6-inch forecast: 17.59 inches southeast of Plantation and 17.41 inches near Dania Beach in 72 hours.[11]

The ground was already primed. Fort Lauderdale had its wettest September on record at 22.34 inches against a normal of 8.02 inches.[12] Soaked ground and full canals carried over into the dry season, so each new storm started with less room to hold water.

Warmer Water

Two trends, both long-term and running high this season, make each storm worse. Warmer water feeds the rain. Higher seas keep it from draining.

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[10] WLRN/FPREN, Florida braces for days of heavy rain (Nov. 17, 2026). https://www.wlrn.org/2026-11-16/florida-braces-for-days-of-heavy-rain-flooding-and-dangerous-coastal-conditions

[11] NWS Miami, Public Information Statement: 72-hour rainfall totals, led by 17.59 inches 2 miles southeast of Plantation and 17.41 inches 1 mile north of Dania Beach (Nov. 19, 2026). https://partnerservices.nws.noaa.gov/products/cache/323-2026/PNSMFL/117b4a44e5cd4efda3bdb270ba263577

[12] FPREN, South Florida's 2026 rainy season (Oct. 25, 2026). https://www.fpren.org/2026-10-25/south-floridas-2026-rainy-season-very-different-between-coasts

Warmer oceans add fuel. Air "holds" about 4% more moisture for each 1°F of warming.[13] East wind that crosses warmer Atlantic, Gulf Stream and Gulf water arrives carrying more moisture, so the same storm can rain harder. This fall the effect is not only long-term: water off Florida's east coast has run at record or near-record warmth, which forecasters say is fueling very heavy downpours on the east coast in November. Warm water also raises the sea itself. Water expands as it heats, so the ocean off Southeast Florida runs highest in the fall, when it is warmest. That seasonal high lands on top of the year's biggest astronomical tides, which is why fall is king tide flooding season, and why this year's unusually warm water likely added to October's high tides.[14,15] Warmer oceans will fuel stronger storms, heavier rains, and higher seas.

Rising Seas and an Aging Flood Control System

Built for a lower sea. Most of South Florida's regional flood protection still runs through the Central and Southern Florida (C&SF) Project, which Congress authorized in 1948. The South Florida Water Management District (SFWMD) operates it with the U.S. Army Corps of Engineers (Corps). The system includes more than 2,175 miles of canals, more than 915 water control structures and 90 pump stations.[16] Its coastal structures were designed to drain canals to the ocean by gravity, and the original design did not plan for future sea level rise.[17] Local storm drains and neighborhood canals empty into this regional network, so when it backs up, the streets back up too. In between sits another layer: dozens of local water control and drainage districts, more than 20 in Broward County alone, that run the secondary canals carrying neighborhood runoff to the regional system.[18]

Higher seas choke drainage. South Florida drains by gravity: water flows downhill through canals and pipes to the ocean, and soaks into the porous limestone underground. Sea level at Virginia Key has risen about 8 inches since 1950, and the rise is speeding up.[19] Three effects follow:

- **Less slope to drain.** A higher tide at the end of the pipe leaves less downhill slope to push water out. SFWMD's Chief Resilience Officer has said 6 inches of sea level rise already means an 80 to 90% reduction in discharge capacity at some structures.[20]
- **Less room underground.** Groundwater rises with the sea, so the soil has less space to absorb rain. U.S. Geological Survey monitoring wells have recorded jumps of up to 5 feet in a single day during heavy rain.[21]
- **Worse at high tide.** Fall brings the highest tides of the year, and onshore wind pushes water higher still, so rain that lands on a high tide has nowhere to go. Rain that drained 30 years ago now sits longer in streets and yards.

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[13] NOAA Climate.gov, image caption on atmospheric moisture and temperature: about 7 percent more water vapor for each 1°C (1.8°F) of warming, or about 4 percent per 1°F. https://content-drupal.climate.gov/media/16553

[14] NOAA Climate.gov, "King tides cause flooding in Florida in fall 2017" (2017). https://www.climate.gov/news-features/event-tracker/king-tides-cause-flooding-florida-fall-2017; NOAA AOML, "Increasing water temperature tied to rapid sea level rise along the U.S. East Coast during 2010-2015," summarizing Domingues et al., Geophysical Research Letters (2018). https://www.aoml.noaa.gov/temp-rapid-sea-level-rise/

[15] Associated Press, "Soaking storms shift north to Florida's Space Coast and prompt water rescues," via NBC News (Nov. 20, 2026). https://www.nbcnews.com/weather/floods/soaking-storms-shift-north-florida-space-coast-california-rcna610368

[16] SFWMD, Broward Basins Flood Resiliency Study public meeting presentation, "Central and Southern Florida Project" (Oct. 23, 2024). https://www.sfwmd.gov/sites/default/files/documents/10_24_2024_BBFR_Public%20Meeting_Presentation_102324_all.pdf

[17] SFWMD and U.S. Army Corps of Engineers, Initial Appraisal Report for the Central and Southern Florida Project (Section 216). https://sfwmd.gov/sites/default/files/documents/CSF-Sect216-Initial-Appraisal-Report-Final.pdf

[18] NOAA Climate Resilience Toolkit, "Water Resources Resilience in Broward County." https://toolkit.climate.gov/course-lesson/water-resources-resilience-broward-county; SFWMD, "Water Control Districts within SFWMD Boundaries." https://www.sfwmd.gov/sites/default/files/documents/298_special_districts_contacts.pdf

[19] Florida Climate Center, Office of the State Climatologist (Florida State University), "Sea Level Rise," citing NOAA tide gauge data. https://climatecenter.fsu.edu/topics/sea-level-rise

[20] Miami Herald / WLRN, "The unseen flooding risk in South Florida" (June 11, 2025). https://www.wlrn.org/light/environment/2025-06-11/the-unseen-flooding-risk-in-south-florida-rising-water-beneath-our-feet

[21] Miami Herald / WLRN, "The unseen flooding risk in South Florida."

Record tides this fall. In late October, king tides and strong onshore winds pushed the Virginia Key gauge to about 1.8 feet above the predicted high tide (October 27, 2026). Tides like these are expected to seem ordinary by the 2030s as the sea keeps rising.[22]

Fixes are underway, but slow. SFWMD and the Corps are studying upgrades to the most vulnerable coastal structures and the canals behind them, and SFWMD has proposed adding pumps at several coastal structures so water can be pushed out when the tide is too high for gravity to do the work.[23] Until those projects are built, each inch of sea level rise takes away drainage capacity the system was designed to have. Broward County is pushing to move faster. In April 2026 it committed $20 million to the Resilient Broward Grant Program, which helps local governments speed up projects that add capacity to the overall system.[24] Working alongside SFWMD, it is also co-funding a Section 203 study of its basins and seeking federal funding for canal and structure upgrades.[25]

A Preview, Not an Outlier

This winter's flooding comes from several problems stacking up at once. A near-record El Niño has parked the storm track over Florida. High pressure to the north turns those storms into days of east wind that pull moisture off unusually warm Atlantic water. That rain then falls on a coast where higher seas, king tides and a drainage system built for 1948 leave it fewer places to go.

For the rest of this dry season, the odds favor:

- **More flash-flood days on the east coast.** Each storm that sets up an east wind can drop several inches over the same neighborhoods, and the worst flooding comes when that rain lands on a high tide and the canals have nowhere to drain.
- **More coastal flooding on the Gulf side, too.** As each Gulf storm crosses the peninsula and moves out into the Atlantic, the wind behind it swings around to blow from the west. That west wind pushes Gulf water onto the Southwest Florida coast, from Naples and Fort Myers to the Keys, the same way the east wind piles water onto the Atlantic side.
- **Drought ending across South Florida by January.** After a dry spring and early summer, the extra rain should refill the ground and canals and lower wildfire risk for the rest of the dry season.
- **More severe weather days.** The risk peaks from January through April, when the strong jet stream helps storms rotate. The 1997–98 El Niño, the closest match to this one, brought Florida's deadliest tornado outbreak in February 1998.

Outlooks shift the odds, not the outcome. NWS Miami notes that 1991–92 was a very strong El Niño dry season that came in drier than normal.[26] The larger lesson will outlast this winter. El Niño will fade, but the conditions that turned its rain into flooding will not. The ocean will keep warming, the sea will keep rising, and a flood control system built for the sea level of 1948 will keep losing ground. This winter is less an outlier than an early look at the normal South Florida is heading toward, and how quickly the region upgrades its drainage will decide how much of that water ends up in streets and homes.

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[22] Miami Herald, "King tides are getting worse in Miami. Predictions show more flooding is coming," via Yahoo News (Nov. 2026). https://www.yahoo.com/news/weather-news/articles/king-tides-getting-worse-miami-093000756.html

[23] SFWMD, "Central and Southern Florida Flood Resiliency Study (Section 216)." https://sfwmd.gov/our-work/central-and-southern-florida-flood-resiliency-study-section-216; SFWMD, Resilient Florida Resilient Projects Plan (Sept. 1, 2021). https://sfwmd.gov/sites/default/files/FDEP_ResilientFlorida_ResilientProjectsPlan_09_01-2021.pdf

[24] Broward County, "Resilient Broward Grant Program." https://www.resilientbroward.com/resilient-broward-grant-program

[25] SFWMD, "C&SF Flood Resiliency (Section 203) Study for Broward Basins, Draft Feasibility Study and Environmental Assessment." https://www.sfwmd.gov/sites/default/files/documents/BB-203_FS-EA_Main_Report.pdf; Broward County, "County and South Florida Water Management District Advance Joint Efforts." https://webapps6.broward.org/newsrelease/View.aspx?intMessageId=14750

[26] NWS Miami, 2026–27 Dry Season Outlook (Nov. 3, 2026). https://www.weather.gov/media/mfl/news/DrySeasonOutlook_2026PublicRelease.pdf