Shoreline
FLORIDA SHORE & BEACH PRESERVATION ASSOCIATION
A League of Cities and Counties on Beach and Coastal Issues

About Shoreline

news from the Florida Shore and Beach Preservation Association
May/June 2020

A Message from FSBPA

The COVID-19 pandemic is changing the way we live, work, and interact with one another. As we all learn to function in this new norm, FSBPA would like to recognize and praise the frontline workers and emergency managers who work tirelessly for the safety of their communities, especially as we move into what is expected to be an active 2020 hurricane season. Local leaders are not only finding ways to safely open beaches, parks, and businesses for their visitors, residents, and workforce in the midst of the pandemic, but now they are also making preparations for the safety and welfare of their communities ahead of the 2020 hurricane season. Let's do our part and be prepared for this storm season. Refresher tips are provided on the Department of Emergency Management's website at https://floridadisaster.org/planprepare/ #HurricanePrep.

In regards to planning the 2020 Annual Conference, FSBPA staff continues to monitor the steps of Governor DeSantis and local leaders to open Florida. We would also like to hear from you, about your ability and readiness to attend an in-the-room conference this September. Your

continued on next page

2019 Sea Level Projections of the Intergovernmental Panel on Climate Change

James Houston, Engineer Research and Development Center, Corps of Engineers

Several publications have projected maximum sea level rises higher than those made in 2013 by the Intergovernmental Panel on Climate Change (IPCC, 2013). Authors of these publications generally claim their projections are higher because of advances since 2013 in the understanding of ice melting in Antarctica that were not available for IPCC (2013) and lead to higher sea level.

READ MORE

Inside this Edition

feedback will help to inform a decision about how we move forward with the 63rd Annual Conference. Please be on the lookout for an email survey about the conference and take a few minutes to complete it for us. Until then, stay safe and enjoy reading this month's Shoreline featuring a report from Dr. Houston on the 2019 IPCC SLR projections, an update from the USACE on the recently completed Midtown Project, and a message from FDEP about its preparations for hurricane season.

Back to Main Page

2019 Sea Level Projections of the Intergovernmental Panel on Climate Change

James Houston, Engineer Research and Development Center, Corps of Engineers

The IPCC included the latest advances in the understanding of Antarctica ice melting in its new 1170-page Special Report, “The Ocean and Cryosphere in a Changing Climate”, which was published in September 2019 (IPCC, 2019). More than 100 scientists were involved in developing the Special Report, using new information developed from 2013-2019 on ice melting in Antarctica. The authors addressed over 30,000 comments from expert peer reviewers and governments from 80 countries (Environmental Defense Fund, 2020).

The IPCC projects temperatures to 2100 based on Representative Concentration Pathways (RCPs). RCPs are greenhouse gas concentration trajectories that describe different climate-scenario futures. Scenarios are labelled after possible radiative forcing values (the difference between sunlight absorbed by the Earth and energy radiated back to space) in the year 2100. For example, RCP 2.6 and RCP 8.5 are scenarios with radiative forcing values in 2100 of 2.6 and 8.5 watts/m2 respectively. The central goal of the Paris Agreement is to keep the increase in global average temperature by 2100 to well below 2° C relative to pre-industrial levels (achieved with an RCP between levels RCP 4.5 and RCP 6.0) and to pursue efforts to limit the increase to 1.5° C (an RCP between RCP 2.6 and RCP 4.5).

Table 1 shows IPCC (2019) projections of worldwide sea level rise. Local vertical ground motions must be combined with the IPCC projections to obtain local relative sea level rise. Projections are median rises for each scenario with likely ranges in parentheses. The projections are for sea level in 2100 relative to the level in 1986-2005. Ranges are basically confidence intervals with IPCC defining a “likely range” as the sea level that will be reached in 2100 with a likelihood of 66-100%.

RCP 6.0 was not included in the 2019 projections because RCP 4.5 and RCP 6.0 projections in IPCC (2013) had mean sea level rises by 2100 that differed by only 2 cm (0.8 in). The next major IPCC projections will be in 2022 and will include new scenarios (RCP 1.9, RCP 3.4, RCP 6.0, and RCP 7.0) in addition to RCP 2.6, RCP 4.5, and RCP 8.5.

Scenario	RCP 2.6	RCP 4.0	RCP 8.5
Sea Level Rise (m)	0.43 (0.29-0.59)	0.55 (0.39-0.72)	0.84 (0.61-1.10)
Sea Level Rise (ft)	1.41 (0.95-1.94)	1.80 (1.28-2.36)	2.76 (2.00-3.61)

Table 1. Sea level rise median values in meters and feet for 2100 relative to 1986-2005 with likely ranges (IPCC 2019)

Next Page

Table 2 shows IPCC (2013) projections to 2100 relative to 1986-2005.

Scenario	RCP 2.6	RCP 4.0	RCP 8.5
Sea Level Rise (m)	0.44 (0.28-0.61)	0.55 (0.38-0.73)	0.74 (0.52-0.98)
Sea Level Rise (ft)	1.44 (0.92-2.00)	1.80 (1.25-2.39)	2.43 (1.71-3.21)

Table 2. Sea level rise median values for 2100 relative to 1986-2005 (IPCC, 2013)

IPCC (2019) notes that the increased contribution of Antarctica to sea level rise to 2100 is only reflected in projections for RCP 8.5. The 2019 projections for RCP 8.5 and its upper range are greater than the 2013 projections by only 0.1 m (4 in) and 0.12 m (4.7 in) respectively. New knowledge of Antarctic ice melting has not changed the 2013 projections greatly.

Coastal communities are often interested in shorter time periods than the 80 years to 2100.

Table 3 gives projections in feet for the next 30, 50, and 80 years relative to 2020. Sea level has risen 0.08 m (0.26 ft) in 2020 relative to 1986-2005 (IPCC, 2013). Therefore, the 2100 projections relative to 1986-2005 have been reduced by 0.08 m for projections from 2020-2100.

Time Period	RCP 2.6	RCP 4.0	RCP 8.5
2020-2050	0.38	0.47	0.67
2020-2070	0.66	0.84	1.27
2020-2100	1.15	1.54	2.49

Table 3. Sea level rise in ft for the time periods given

A December 2019 draft paper will likely result in an increase of 0.05-0.12 m (2-5 in) in the IPCC projections scheduled for 2022. The Ice Sheet Mass Balance Inter-comparison Exercise (IMBIE) Team of 89 scientists published this draft paper that contains its latest analysis of the contribution of Greenland to sea level rise (Shepherd, et al 2019). This work was not available early enough to be included in ICCE (2019), but some IMBIE members will likely be among IPCC members will who prepare the 2022 report. Shepherd et al (2019) say that cumulative ice losses from Greenland from 1992-2013 imply a sea level rise contribution from Greenland by 2100 that is 0.05-0.12 m (2-5 in) greater than IPCC (2013, 2019) projections. However, there was a drop in the rate of ice loss for 2013-2018, so additional years of measurement will be required to improve estimates of Greenland's contribution to sea level rise.

The likelihood of scenario RCP 8.5 occurring has been questioned in recent years. RCP scenarios were developed from 2007-2010 (Van Vuuren, et al 2011), and events since then have significantly reduced the likelihood of RCP 8.5. Van Vuuren, who led development of the RCP scenarios, recently noted that RCP 8.5 has become less likely because "… several countries and companies have adopted climate policy inspired by the Paris Agreement, but also the costs of solar photovoltaics and wind have come down much more rapidly than originally expected" (CarbonBrief 2019).

Next Page

RCP 8.5 assumes a huge increase in coal burning with seven times more coal burned in the year 2100 than in 2013, and also assumes there will be minimal technology advancements to reduce carbon emissions (Riahi, et al 2011). However, coal usage to generate power has been dropping very rapidly and is now projected to decline worldwide by 85% by 2050 (International Renewable Energy Agency, 2018). Fracking technology has made the cost of natural gas (with about half the carbon emissions per energy output of coal) much cheaper than coal (U.S. Energy Information Administration, 2020). More significantly, technology advances have made unsubsidized solar and wind energy now the cheapest providers of new energy in almost all major economies including China and India (Institute for Energy Economics and Financial Analysis, 2018).

The willingness and ability of countries to limit carbon emissions as specified in the Paris Agreement is problematic. However, the much more powerful force of economics is taking hold. U.S. coal plants have been closing rapidly as energy from natural gas, wind, and solar has become much cheaper than coal, resulting in U.S. carbon emissions that have fallen 12% from 2007-2018 (Statista, 2019). Figures 1 and 2 show that 66% of all power generation added in the U.S. in 2019 and 78% planned in 2020 come from renewable sources with the remainder from natural gas. Similarly from 2017-2018 about 50% of the new power generation increase in the 26 countries of the Organization for Economic Co-operation and Development came from natural gas, 46% from renewable energy, and 4% from nuclear energy with power generation from coal dropping very rapidly.

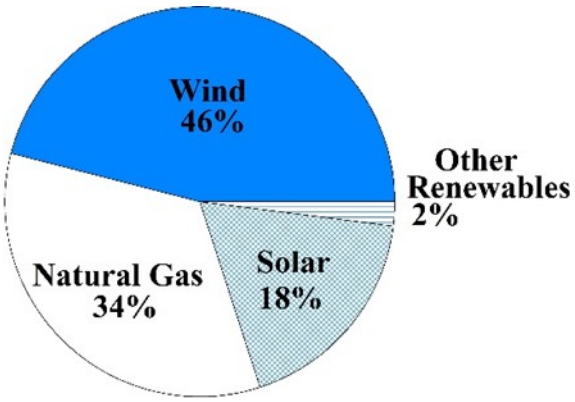

Figure 1. Power added in the U.S. in 2019 (U.S. Energy Information Administration, 2019).

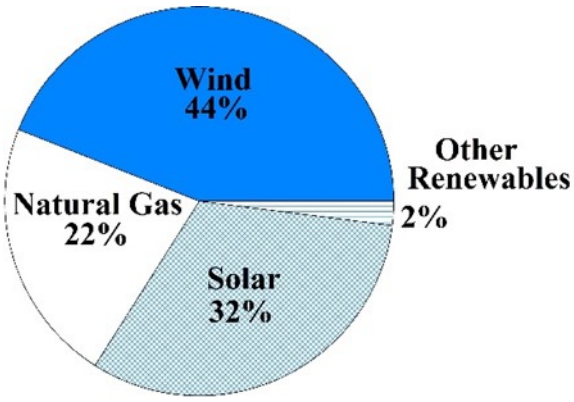

Figure 2. Power planned to be added in the U.S. in 2020 (U.S. Energy Information Administration, 2019).

Next Page

Ritchie and Dowlatabadi (2017) concluded that RCP 8.5 with its "vast future coal combustion is exceptionally unlikely. Therefore, RCP 8.5 should not be a priority for future scientific research or a benchmark for policy studies."

Figure 3 compares satellite altimeter sea level measurements since they began in late 1992 with IPCC (2019) projections starting in 1995 (average base year of 1986-2005) and extending to 2018. Projections based on RCP 8.5 and its upper range have not been tracking worldwide sea level rise for the past 25 years. Because RCP 8.5 is "exceptionally unlikely" to occur, focus should be on scenarios RCP 2.6 and RCP 4.5 in Tables 1 and 3.

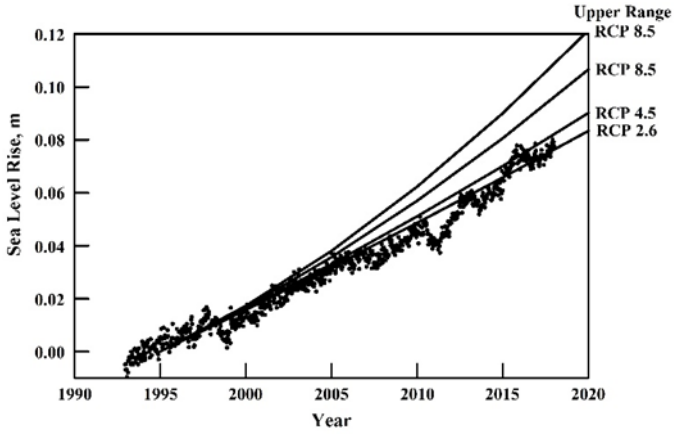

Figure 3. Comparison of altimeter recordings (dots) versus IPCC projections starting in 1995 (University of Colorado, 2020).

References

CarbonBrief, 2019. Explainer: The high-emissions 'RCP8.5' global warming scenario. https://www.carbonbrief.org/explainer-the-high-emissions-rcp8-5-global-warming-scenario.

Environmental Defense Fund, 2020. Four takeaways on climate change and sea level rise in the latest IPCC report. http://blogs.edf.org/climate411/2019/10/03/four-takeaways-on-climate-change-and-sea-level-rise-in-the-latest-ipcc-report/.

Intergovernmental Panel on Climate Change, 2013. In: Climate change 2013: The physical science basis. Contribution of working group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. https://www.ipcc.ch/report/ar5/wg1/.

Intergovernmental Panel on Climate Change 2019: Summary for Policymakers. In: IPCC Special Report on the Ocean and Cryosphere in a Changing Climate [H.-O. Pörtner, D.C. Roberts, V. Masson-Delmotte, P. Zhai, M. Tignor, E. Poloczanska, K. Mintenbeck, M. Nicolai, A. Okem, J. Petzold, B. Rama, N. Weyer (eds.)]. In press. https://report.ipcc.ch/srocc/pdf/SROCC_FinalDraft_FullReport.pdf.

International Renewable Energy Agency, 2018. Energy Transformation. https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2018/Apr/IRENA_Report_GET_2018.pdf.

Riahi, K., Rao, S., Krey, V., Cho, C., Chirkoy, V., Fischer, G, Kindermann, G., Nakicenovic, N., and Rafaj, P., 2011. RCP 8.5-A scenario of comparatively high greenhouse gas emissions. *Climatic Change*, 109, 33-57. https://link.springer.com/content/pdf/10.1007%2Fs10584-011-0149-y.pdf.

Next Page

Ritchie, J. and Dowlatabadi, H., 2017. Why do climate change scenarios return to coal?, *Energy*, 140, 1276-1291.
Shepherd, A., Ivins, E., Rignot, E. et al., 2019. Mass balance of the Greenland Ice Sheet from 1992 to 2018. *Nature,* electronic publication prior to printing. https://www.nature.com/articles/s41586-019-1855-2.
Statista, 2019. Carbon dioxide emissions from energy consumption in the U.S. from 1975 and 2018 (in million metric tons of carbon dioxide). https://www.statista.com/statistics/183943/us-carbon-dioxide-emissions-from-1999/.
U.S. Energy Information Administration, 2019. New electric generating capacity in 2019 will come from renewables and natural gas. https://www.eia.gov/todayinenergy/detail.php?id=37952.
U.S. Energy Information Administration, 2020. How much carbon dioxide is produced when different fuels are burned? https://www.eia.gov/tools/faqs/faq.php?id=73&t=11.
University of Colorado, 2020. 2018_rel1: Global Mean Sea Level Time Series (seasonal signals removed). http://sealevel.colorado.edu/.
Van Vuuren, D. P., Edmonds, J., Kainuma, M. Riahi, K., Thomson, A., Hibbard, K., Hurtt, G.C., Kram, T., Krey, V., Lamarque, J-F, Masui, T., Meinshausen, M., Nakicenovic, N., Smith, S.J., and Rose, S.K., 2011, The representative concentration pathways: an overview, *Climatic Change* 109:5-31. https://link.springer.com/content/pdf/10.1007/s10584-011-0148-z.pdf.

Back to Main Page

USACE Jacksonville District

US Army Corps of Engineers®

Palm Beach County Midtown Nourishment Project Update

The Palm Beach County Shore Protection Project Midtown was federally nourished in spring of 2020. The project was initially constructed in 1995 but this was the first instance of federal participation. The project was funded under Public Law 115-123, otherwise known as the Bi-Partisan Budget Act of 2018, in response to the frequent coastal disasters that have impacted the United States in recent years (including Hurricanes Matthew and Irma in 2016 and 2017, respectively). The project marks the beginning of a 50 year partnership between the federal government and the Town of Palm Beach to maintain the beach. The U.S. Army Corps of Engineers awarded a contract of $19.1 million dollars to Weeks Marine for the project work.

Construction of the Midtown nourishment began on 23 March 2020 and concluded 1 May 2020. Approximately 700,000 cubic yards (cy) of material was placed on the beach between Casa Bendita and Banyan Road. Work started at Clarke Avenue and progressed northward until it reached The Breakers. Work then reversed and moved south until reaching the southern limit of the project. Finally, the portion of the project north of The Breakers was completed. The material was dredged onto the beach from an offshore borrow area near the Palm Beach Inlet.

Figure 1 and Figure 2 show aerials of the project before construction (21 December 2019), towards the end of construction (22 April 2020), and after the completion of construction (01 May 2020).

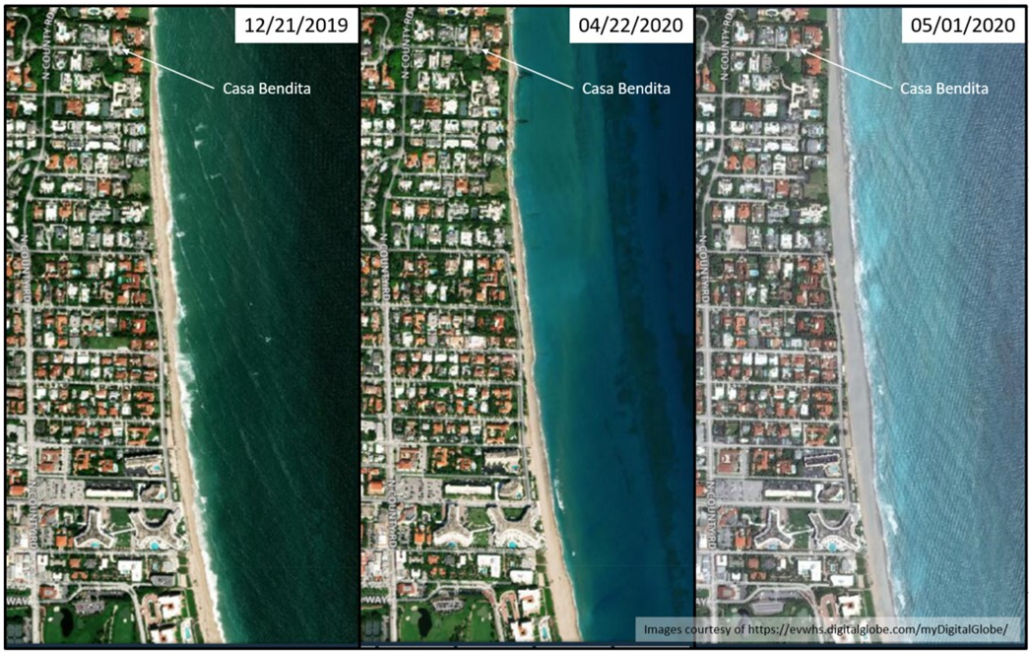

Figure 1: North End of Project Aerials

Next Page

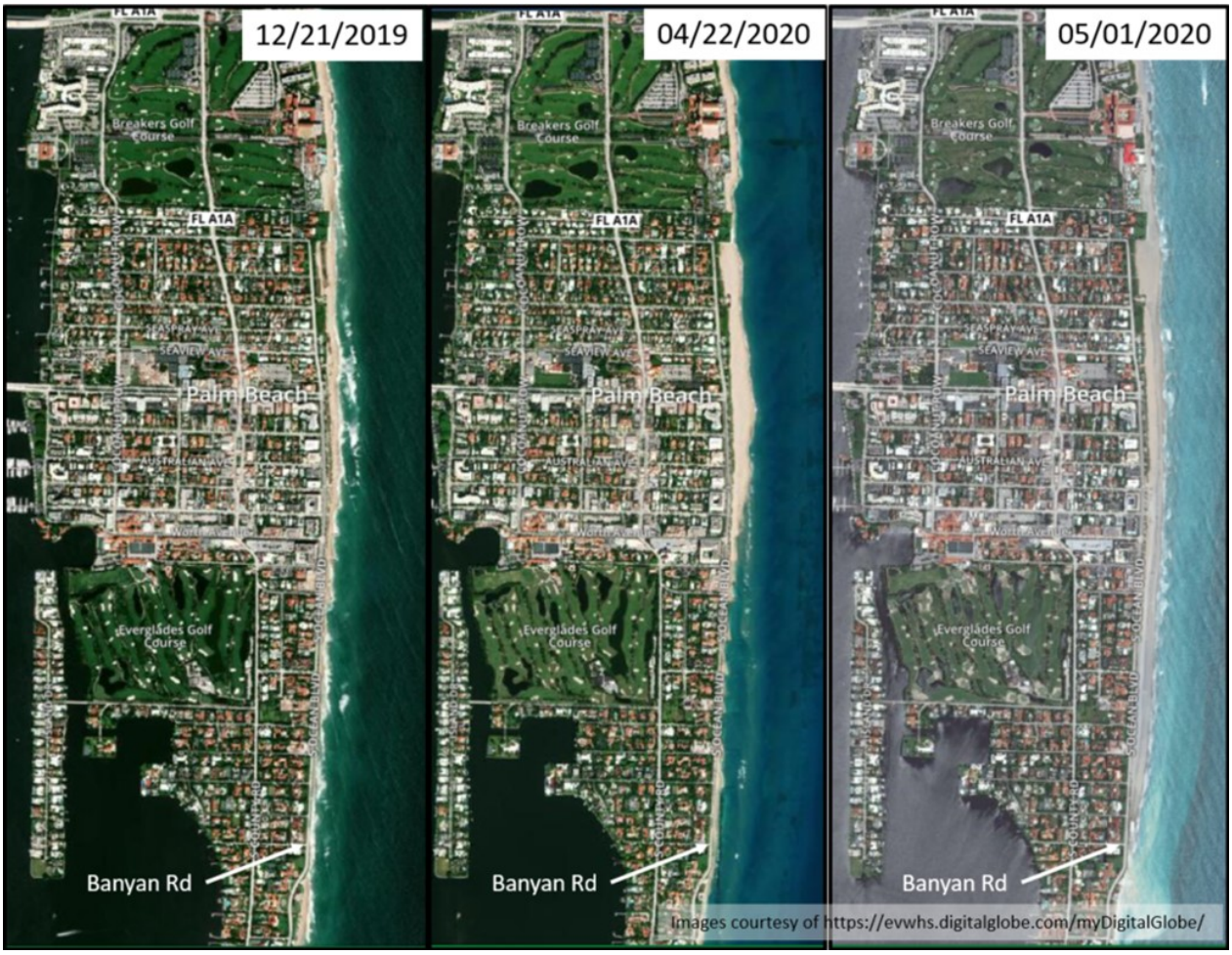

Figure 2: South End of Project Aerials

Back to Main Page

FDEP Office of Resilience and Coastal Protection Updates

Preparations for 2020 Hurricane Season Are Underway

The 2020 Hurricane Season is quickly approaching, and the Florida Department of Environmental Protection's (DEP) Office of Resilience and Coastal Protection (RCP) has started scheduling annual pre-storm season preparations.

For the last several years, the Beaches Program has participated in DEP's annual statewide hurricane exercise with the Office of Emergency Response (OER), the state Division of Emergency Management (DEM) and the Federal Emergency Management Agency (FEMA). However, as the State continues to mitigate the spread of COVID-19, , OER will instead conduct an internal hurricane tabletop exercise during the second week of June.

The Beach Field Services (BFS) section of RCP will perform pre-2020 hurricane season windshield survey inspections beginning May 18. BFS will use a two-week window between May 18 and May 29 for windshield survey inspections to be completed.

Our Coastal Construction Control Line field inspectors, along with trained DEP District Office staff, will perform the pre-storm season baseline inspections in pre-determined areas for each coastal county in Florida.

The collected pre-storm inspection reports then serve to document baseline conditions prior to hurricane season and assist assessment of post-storm impacts to beaches, dunes and upland structures. The pre-storm baseline inspection photos provide excellent comparative value when assessing damage caused by storm events.

All collected pre-storm inspection reports will be shared with OER prior to DEP's internal hurricane tabletop exercise, and any post-storm windshield survey inspection reports also are shared with OER and DEM.

Another BFS pre-hurricane season preparedness task involves specific outreach to Florida coastal county and local governments.

Prior to June 1 of each year, RCP sends specific outreach and guidance information regarding post-storm emergency response to local government officials local sponsors affiliated with RCP through beach nourishment and beachfront private-property owners.

To facilitate coordination with beachfront private property owners, the general public and local government, RCP's outreach provides links to our Hurricane and Tropical Storm Information webpage. The hurricane webpage offers valuable post-storm information designed to assist both private-property owners and local governments with answers to the many questions that arise in the post-storm emergency response environment.

Within this resource, RCP has developed a public information handout which includes an easy-to-follow table to explain what activities can be authorized, and by whom, under a department-issued Emergency Final Order.
Soon, DEP staff will be documenting procedures and policies for preparing post-storm damage assessment and corresponding recovery plans, including repair cost estimates as required by the 2019 amendment to Chapter 161.161 (1)(k), F.S.

Next Page

Beaches Funding

A third public workshop on the Chapter 62B-36 Florida Administrative Code ranking process for funding applications was held April 23 via webinar. Approximately 70 people participated. Workshop materials, recordings and comments received are posted on the Beaches Funding Program's webpage. The department thanks all stakeholders for their participation.

The new project manager for the Palm Beach, Broward and Dade counties is Karen Milicic (Karen.Milicic@FloridaDEP.gov). Welcome Karen!

Strategic Beach Management Plan and Inlet Management

The updated Strategic Beach Management Plan (SBMP) 04-2020 edition has been posted to the department's web page

Please note the introduction contains a chart of all the managed miles in Florida and notes which beach projects are federal projects.

If you need to see older editions of the SBMP, visit OCULUS at https://depedms.dep.state.fl.us/Oculus/servlet/login, and use the Public Login.
It also should be noted that most of the inlet studies and reports DEP has, are located at the link listed above and in OCULUS.

Staff will prepare the annual Inlet Management Report as required by the 2019 amendment to Chapter 161.143(5), F.S. The plan is to create and continuously update an online geodatabase accessible via MapDirect and publish an annual summary report.

Permitting

Both permitting and project construction are ongoing and very active. The department is coordinating with the Florida Fish and Wildlife Conservation Commission on turtle monitoring and relocations. We appreciate the cooperation we have received from local sponsors and consultants to help keep the JCP Projects Status page on the BIP website up to date.

RCP staff are still teleworking, so please let your permit manager know if you have mailed a CD, check, etc., to ensure that the appropriate administrative staff are notified about where to redirect the item.

Online Learning Resources Available

Learn something new about Florida's environment! Coloring pages, story maps and other activities invite learners of all ages to explore the land, the waterways and the plants and animals in Florida and beyond. Visit FloridaDEP.gov/ KidZone.

Back to Main Page

Shoreline

A monthly electronic publication of the Florida Shore & Beach Preservation Association.

Florida Shore & Beach Preservation Association
PO Box 13146, Tallahassee FL 32317
Phone: (850) 906-9227 • **Fax:** (850) 462-3575
www.fsbpa.com • mail@fsbpa.com

CALENDAR OF EVENTS

FSBPA Conferences

September 16-18, 2020

FSBPA Annual Conference

Hyatt Regency Coconut Point, Bonita Springs, Florida

February 3-5, 2021

34th Annual Tech Conference

Embassy Suites by Hilton, St. Augustine Beach, Florida

Follow us on

Back to Main Page