

UC Santa Barbara

Newsletters

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UC SANTA BARBARA

North Campus Open Space Restoration Project



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NCOS NEWS

May 2017

PROJECT UPDATES

- In the last couple weeks, the NCOS grading contractors have been establishing environmental protection measures, salvaging special soil and plants (Figure 1 below), and removing the cement golf cart pathways and buried obsolete water and irrigation pipes in preparation for grading and movement of soil, which will begin the second week of May. Grading and soil movement will be done using low ground pressure equipment specially designed to work in and around wetlands (Figure 2 below).



Figure 1.
Photos of

the native plant and special soil salvage efforts at the NCOS restoration project.



Figure 2. The specially designed graders that will be used for the grading and soil movement.

- A ground breaking celebration was held on Wednesday, April 25th to mark the next major step in the restoration of the upper arms of Devereux Slough. Articles about the event were published by the [US Fish and Wildlife Service](#), and a [local news source](#).
- UCSB has opened the bidding for contracts to construct the trails and bridges portion of the restoration project, and we hope these will be completed within a year.
- CCBER staff and collaborating biologists have completed surveys for tidewater goby and California red-legged frog (CRLF) in the creeks and ponds of NCOS. No individuals of either species were found during the surveys. CRLF have never been documented as being present in Devereux Creek, but have been found in Bell and Tecolote creeks to the west. Tidewater Goby were found in Phelps and Devereux Creeks, and in Devereux slough before the drought, but haven't been observed in the past 4 years in either location.
- [The Southern California Wetlands Recovery Project](#) awarded CCBER a \$30,000 grant to restore riparian habitat to an expanded channel off Whittier Drive. This project will begin in September and will include community planting days, funding for school trips, birding and educational tours. We look forward to your participation in the Whittier Channel Restoration Project!

- The [California Natural Resources Agency](#) recently awarded \$350,000 in Environmental Enhancement funds to CCBER to enhance and restore the 25 acres of the South Parcel Reserve that lie between the current South Parcel and NCOS restoration projects. We'll be removing invasive pampas grass, harding grass, fennel and mustard from the site in the coming years.
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FEATURE STORY



The past, present, and future hydrology of Devereux Slough

The 2016-17 rainfall season turned out to be wetter than expected, and this was reflected by repeated flooding of the former Ocean Meadows golf course and NCOS project site. A series of water level monitoring devices in the creeks that flow into Devereux Slough, and in the slough itself, tell an interesting story of how the precipitation and the hydrology of the site interacted prior to the restoration project.

[This feature story is continued on page 6.](#)

VOLUNTEER OPPORTUNITIES



Tree Planting

Plant a legacy tree and watch it grow as you access Ellwood Mesa! There are three more opportunities to help plant oak trees near the Phelps Road access to Ellwood Mesa - Saturdays in May: May 6, 13 and 20th from 9-12. Contact [Your Children's Trees](#) to volunteer. 50 of the 86 trees have been planted. Nectar, pollen and seed-producing coastal sage scrub plants will be planted later to enhance the ecological functions of this site.



CCBER Greenhouse Associates

Join the CCBER Greenhouse Associates Thursday mornings (9:00 – 12:00)! Come transplant seedlings, learn about restoration, get to know your neighbors and CCBER staff, and help maintain native plants and their nursery! To join, please send an email to ncos@ccber.ucsb.edu

COMMUNITY FORUM

Construction Fencing

We realize that the temporary fencing of North Campus Open Space may be frustrating. For your safety, please respect the fences during the construction period. We are working very hard to complete the restoration, trails and bridges as expeditiously as possible, and we look forward to opening the restored NCOS site to the public as soon as possible. Our goal is to open the site by April 2018, when we hope to have the trails completed.

However restoration work will be in full swing at that time, and there will be vehicles using the trails to deliver plants, and shuttle tools and supplies. We will be continuously assessing how the shared use works. Progress on completing the construction may also be affected by the fall and winter rains, so it is difficult to pinpoint the exact schedule at this time.

We gladly welcome volunteer help, and there are opportunities to get involved now in restoration work at the CCBER native plant nursery and on field sites in and adjacent to the NCOS project site. If you're interested in these opportunities, please send an email to: ncos@ccber.ucsb.edu

Photo Submission

Want to see one of your photos on a future newsletter? We welcome submissions of photos from the Ellwood-Devereux area to share with NCOS News readers. Please email a photo you would like to share, along with a brief description to ncos@ccber.ucsb.edu.

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**For more information on the
North Coast Open Space Restoration Project, [Click here](#), or email ncos@ccber.ucsb.edu**

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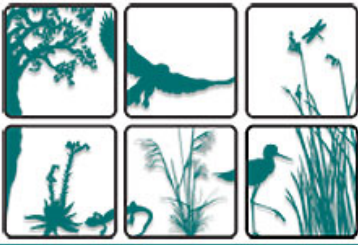
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THE PAST, PRESENT, AND FUTURE HYDROLOGY OF DEVEREUX SLOUGH



The 2016-17 rainfall season turned out to be wetter than expected, and this was reflected by repeated flooding of the former Ocean Meadows golf course and NCOS project site. A series of water level monitoring devices in the creeks that flow into Devereux Slough, and in the slough itself, tell an interesting story of how the precipitation and the hydrology of the site interacted prior to the restoration project.

Devereux slough once extended throughout and beyond the boundaries of the former golf course (Figure 1). In the mid 1960s, the upper portion of the slough was filled in to create the golf course and housing sites, as can be seen in this 1967 aerial photo (Figure 2). The 3.2 square mile watershed reaches the slough through 4 tributaries that funnel their way through the former upper arms of the slough. From the west is Devereux Creek, from the north is Phelps Creek, from the northeast is the Whittier channel, and from the east is a small, unnamed tributary from the Storke Ranch housing area that once connected Devereux Slough to Goleta Slough (Figure 3). These channels merge together in the middle of the NCOS restoration project site, and the flow into Devereux Slough is controlled by a sheet-pile grade control structure that separates the creek system from the slough.

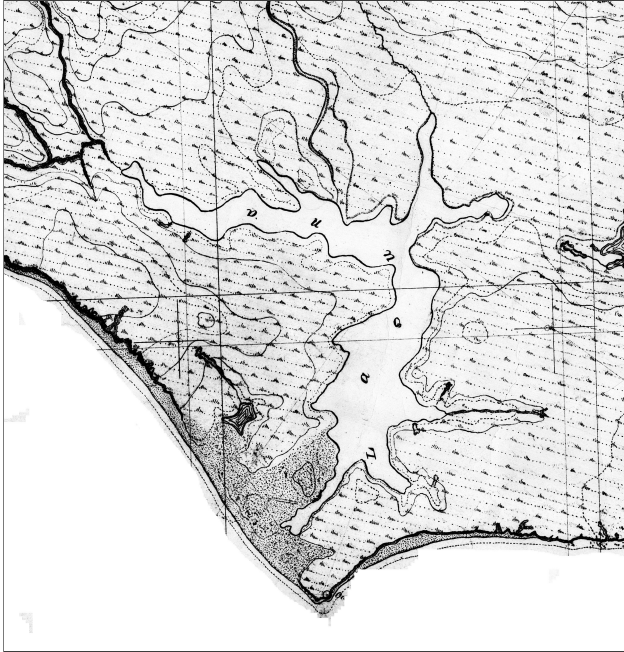


Figure 1. Portion of a U.S. Coastal Survey Map from 1871-73.



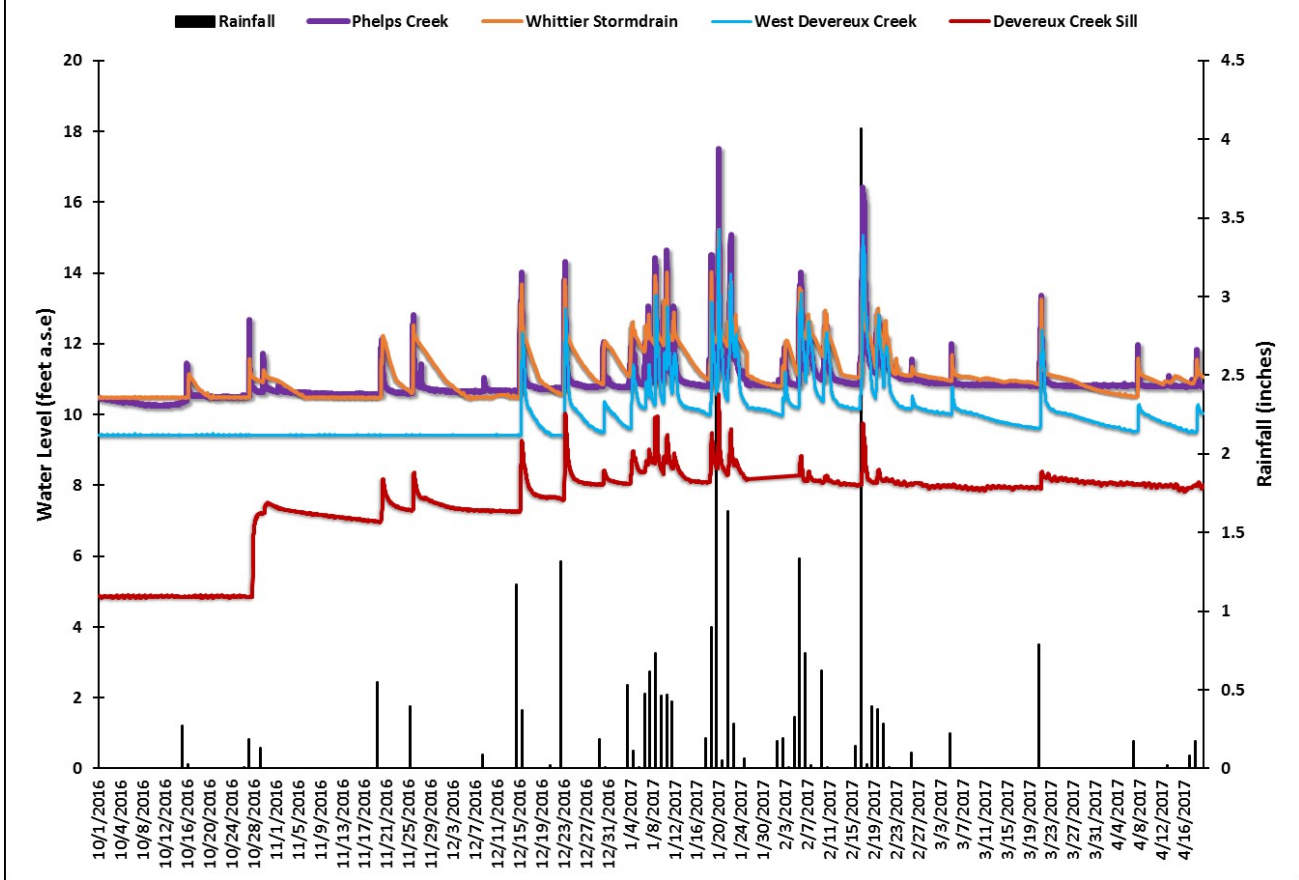
Figure 2. Aerial photograph from 1966.



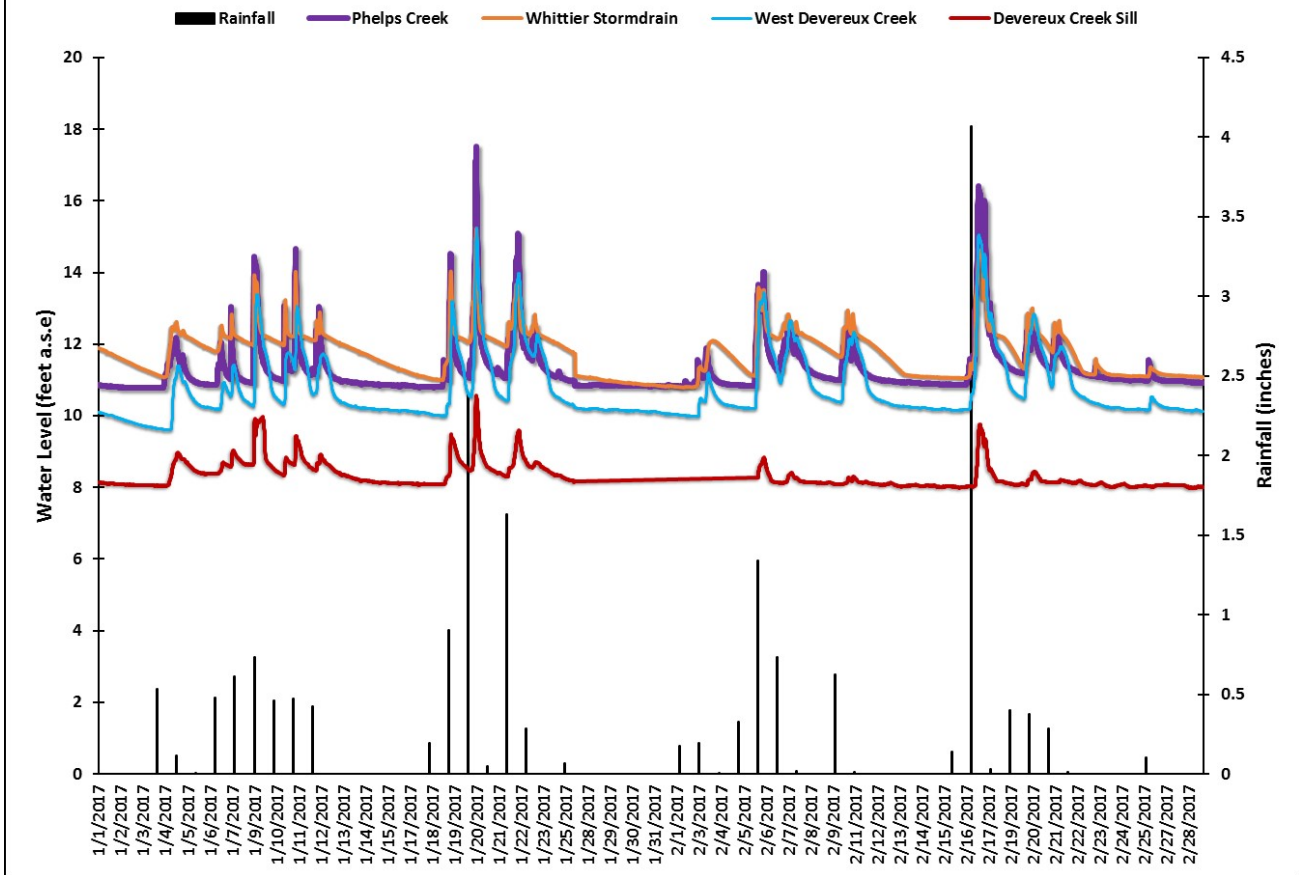
Figure 3. Map of the tributaries and flow of water through Devereux Creek and Slough.

CCBER maintains water level sensors in these tributaries and in the slough. The two graphs below show the changes in water levels in the creeks from October 2016 through April 2017, with a close-up of the January-February period when the heaviest rains fell. These figures show that water levels near the junction of Phelps creek and Devereux creek (purple line) had peak flows of 17.5 feet above sea level during a heavy rainfall event (more than 2 inches in a few hours) on January 20th, and 16 feet above sea level during the large storm (more than 4 inches of rain) on February 17th. The ground level elevation of the former golf course ranges from 10 to 15 feet and, therefore, stormwater easily rises over the edges of the channelized creeks and floods the site during relatively minor to moderate rain events of 2 inches or more.

Water Level in NCOS Creeks - Oct 2016 to April 2017



Water Level in NCOS Creeks - January to February 2017

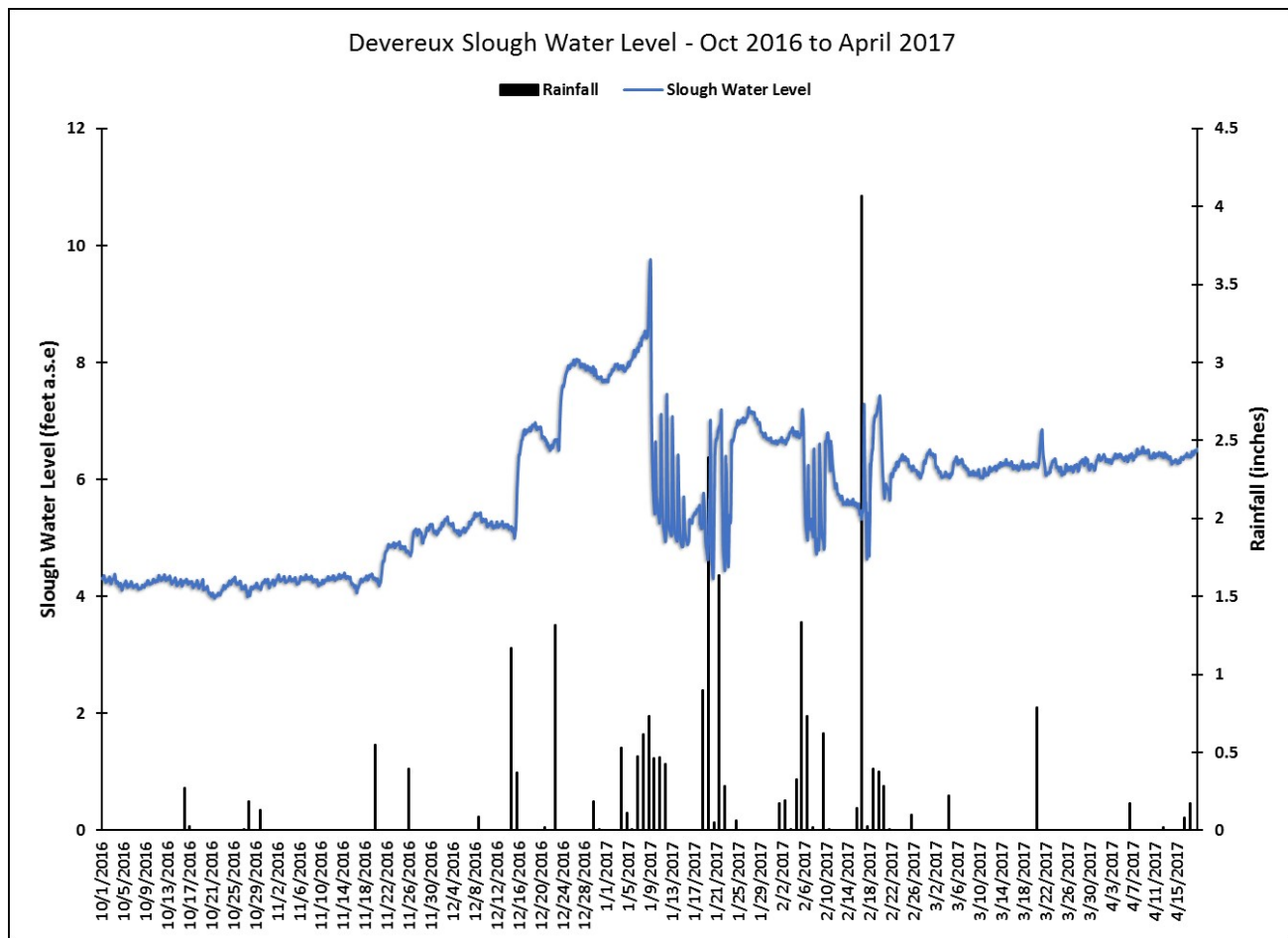


The NCOS restoration project will remove 1 to 6 feet of soil from the filled flood plain and former estuary. This will enable stormwater flowing down the creeks to expand over ground that will be at elevations ranging from 5 to 10 feet (rather than 10

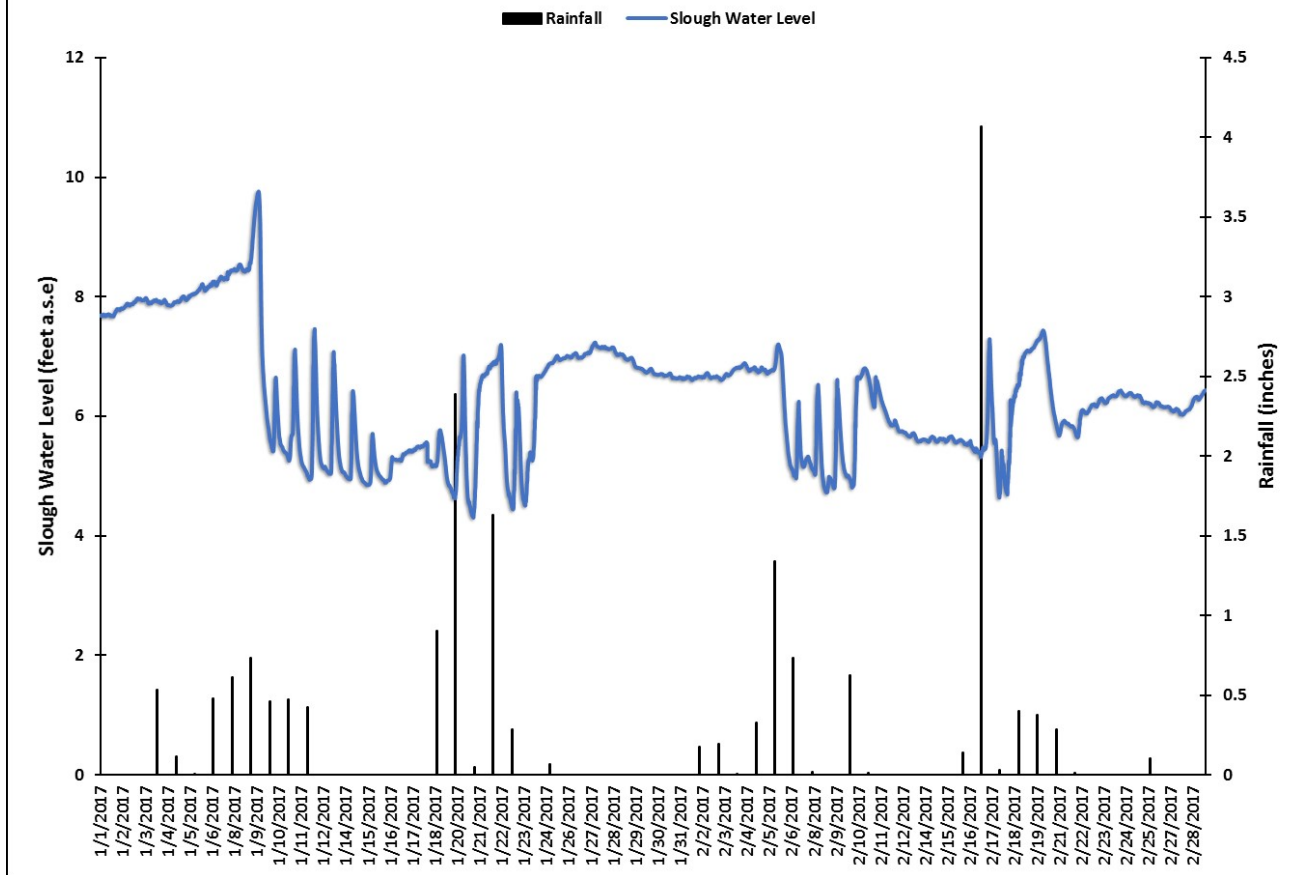
to 15 feet). Therefore, water levels will be further below the adjacent homes once the project is completed. This aspect of the restoration project design was developed in part with [models documented by project hydrologists](#) showing a drop in flood elevations of 1.5 to 2 feet in peak 100-year storm events.

In addition, rather than having the flows channelized into the narrow creeks and then flooding over the banks during significant rain events, the restored system will allow the flows to spread out more naturally and persist for a longer period of time, providing important habitat for foraging shorebirds, and for water fowl, fish and other wildlife.

Devereux Slough is an intermittently tidal system, which means that there is a sand bar at the mouth where the slough meets the ocean. This sand bar changes height depending on the waves and is breached when water levels in the slough reach almost 10 feet, the average height of the berm. When the water in the slough breaches the berm, the system becomes tidal. This pattern is clearly seen in the data recorded by the level logger in the slough and displayed in the two charts below. The figures show that the height of water in the slough ranged from 4 to 5 feet in elevation during the fall, then began to rise as winter rains started to fall and fill the slough. On January 9, the water level peaked at almost 10 feet following consecutive storms, the sand berm was breached and the water level quickly dropped by more than 4 feet as the water in the slough emptied into the ocean. This breach event began a period of several weeks when water levels in the slough periodically fluctuated daily with the tides, until the mouth gradually filled with sand, replacing the berm and holding the water level near 6.5 feet in elevation through early spring.



Devereux Slough Water Level - January to February 2017



During summer, the sun's energy will evaporate water from the slough surface at a rate of approximately 4 to 6 inches per month. Once the NCOS restoration project is complete, the whole system will be connected to the mouth and should follow patterns very similar to what is shown in the figures above. Rain events will fill up the system, and when water levels reach 8 to 10 feet, depending on waves and tides, the sand bar will be breached and the system will become tidal for 1 to 3 weeks until the mouth is slowly closed up again.

Another aspect of the restoration project design takes into account the potential effects of future sea level rise in a couple of ways. The first is that the amount of soil excavated will be less than what could have been moved in order to provide what is called a 'transgression zone'. This zone will be high enough in elevation to continue to support salt marsh vegetation that might otherwise get flooded out with just 1 to 3 feet of sea level rise that is projected for the coming 50 to 100 years. The second way the system is designed to consider sea level rise is that, with the increased capacity of the system, especially at higher sea levels, the mouth will be open for longer periods of time. When it is tidal, water levels will be lower, on average, than they would be in a smaller system, where the sand bar would build up higher and higher with sea level rise. With these considerations factored into the restoration design, the public access and recreation values of the site, and the diversity of habitats created, will be preserved.

As part of the long term management of the Devereux Slough system, we will be monitoring many of the aspects its hydrology in order to see how it performs, and to document sea level rise and carbon sequestration processes in the restored system.

Date:

Thursday, May 4, 2017 - 16:45

[Contact Us](#)

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