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What rising sea levels mean for agriculture in South Florida | Column

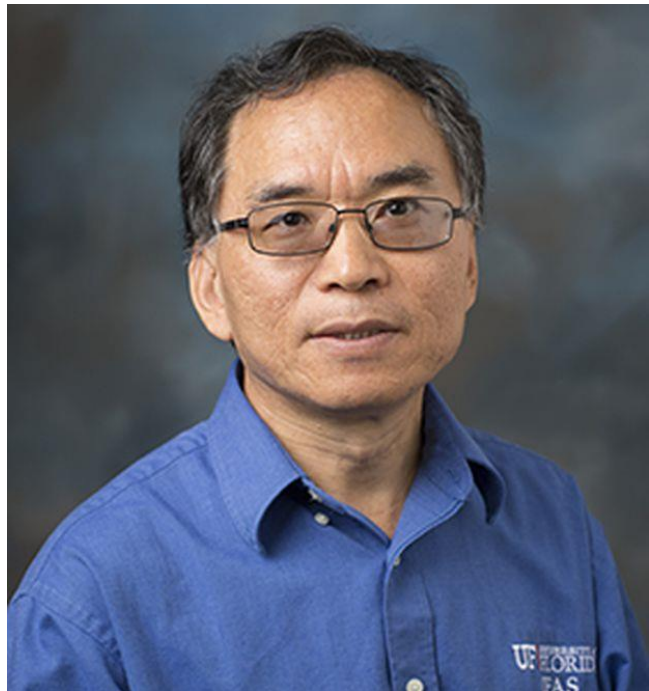
Many areas of the South Dade Agricultural area — with nearly 71,000 acres being farmed — have an elevation less than 3 feet above sea level.



Florida is surrounded by water, so projections that sea levels will rise up to one foot — and even more in some areas, including Tampa Bay — by 2050 are bad news. This estimate comes from a new report issued by the National Oceanic and Atmospheric Administration, which gives a “what’s coming” look at tide, wind and storm-driven extreme water levels that will likely drive future coastal flood risk. Moderate flooding is expected to occur more than 10 times as often as it does now, according to NOAA.



Haimanote Bayabil [Provided]



Yuncong Li [UF/IFAS Photo by Camila Guillen]

U.S. Secretary of Commerce Gina M. Raimondo said the intent of the report is to help businesses and communities know what to expect and plan for the future. Much of the concern over sea level rise focuses on the threat to waterfront homes, coastal businesses and recreation spots. A less obvious area for concern is the impact to agricultural production.

Florida currently produces more than 300 different commodities, from tomatoes to strawberries, which generated roughly \$7.4 billion in cash receipts in 2020. Agriculture in Florida, and particularly in South Florida, is a significant contributor to the state's economic vitality.

Safeguarding and advancing agricultural production in south Florida means we must act now to reduce saltwater intrusion, which affects soil, surface and groundwater quality, and plant viability, given that many farmlands in Florida are near the coastline. For example, many areas of the South Dade Agricultural area, which as of 2017 had nearly 71,000 acres being farmed, have an elevation of less than 3 feet above sea level.

Even a slight increase in saltwater intrusion into Florida's aquifers could have major repercussions in availability of fresh water for drinking and agricultural purposes. Consider that in South Florida, 90 percent of drinking water comes from underground aquifers. At the same time, agriculture depends heavily on groundwater.

Sea level rise is a complex and serious problem, with multiple factors requiring many approaches and dedicated effort over time.

While we may not be able to stop sea level rise quickly, we can take action to mitigate some of the impact of saltwater intrusion on Florida's agricultural productivity and farmers' livelihoods. Florida's rising stature as a food producer necessitates taking this issue seriously and adopting both short-term mitigation measures and long-term adaptations, such as investing in and breeding salt-tolerant crops.

Short-term management practices could be implemented at farm and field levels and show effects quickly. One potential approach is to flush salt-affected soils with freshwater, a quick way to keep soil salinity low; however, this method is limited by availability of freshwater and potential for contamination of groundwater.

Improving irrigation efficiency also is critical to reduce salt build up in the soil and the need to pump groundwater, which will, in turn, reduce flow of saltwater further inland.

The use of solid oxygen fertilizers has been demonstrated to provide plant roots with needed oxygen in soil depleted by salinity and also improve their resistance to salt and flooding. Gypsum, biochar and compost are soil amendments that could help counter negative effects of salt-soaked soil, as can the use of cover crops which reduce salt buildup. Farmers also could use raised beds to grow plants, elevating their roots.

Long-term management practices often take a more protracted process for development and adoption and will depend on growers' willingness to adopt new practices and, potentially, invest capital in new or modified farm equipment.

Many major crops grown in South Florida are sensitive to high salinity and flooding, such as snap beans, strawberries, avocados and papaya. There are a few plants with limited tolerance to salinity and flooding, such as coconut, guava, jujube, dragon fruit and mango for tropical fruit growing area. Lastly, integrated pest management will be key to mitigate disease and pest impacts that arise with saltwater intrusion.

We are in a race against time to better understand the mechanisms and negative impacts of sea level rise and saltwater intrusion on freshwater resources, soil health, crops and our ability to play a role as a major food producer. Coming up with the best management practices to mitigate these impacts should be a priority to safeguard food and water security.

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