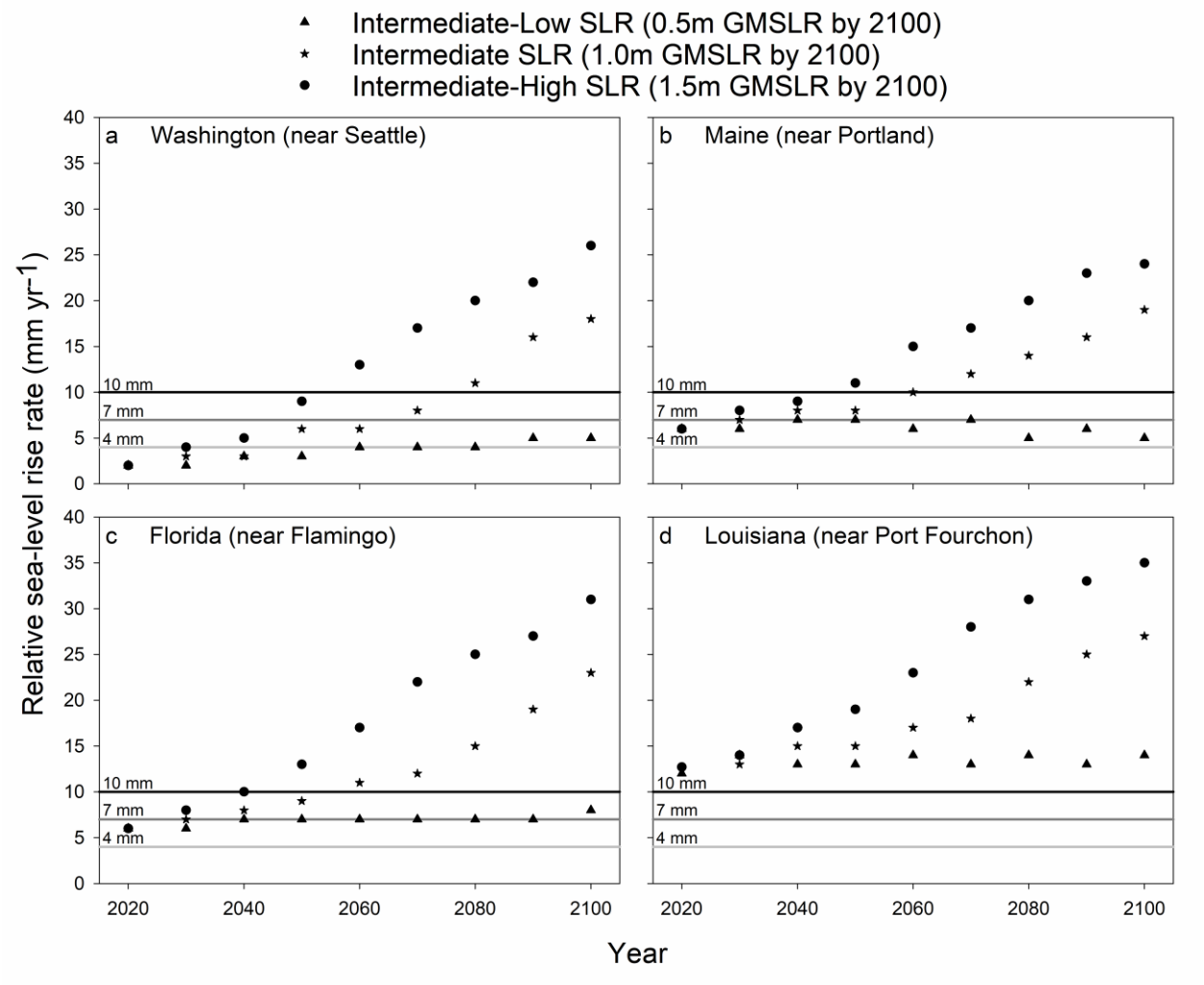
SUPPLEMENTARY INFORMATION

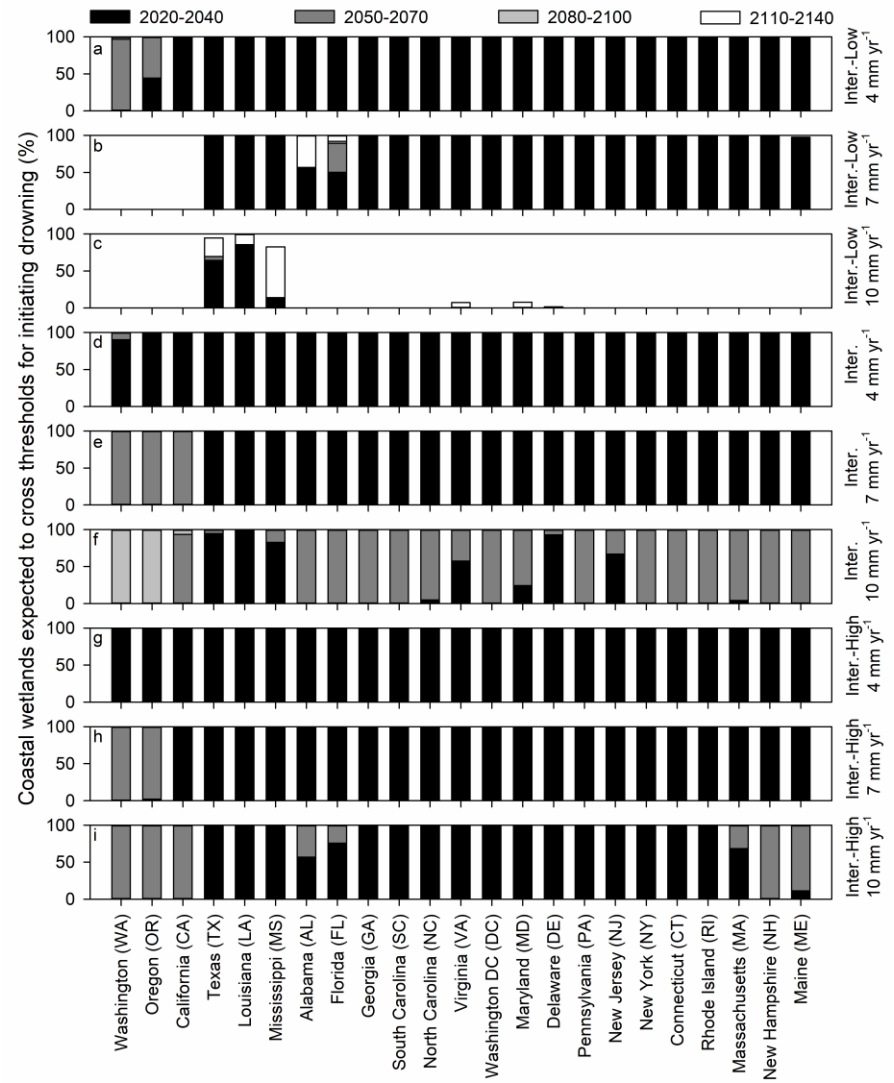
Title: Rising seas could cross thresholds for initiating coastal wetland drowning within decades across much of the United States

Authors: Michael J. Osland, Bogdan Chivoiu, James B. Grace, Nicholas M. Enwright, Glenn R. Guntenspergen, Kevin J. Buffington, Karen M. Thorne, Joel A. Carr, William V. Sweet, Brady R. Couvillion

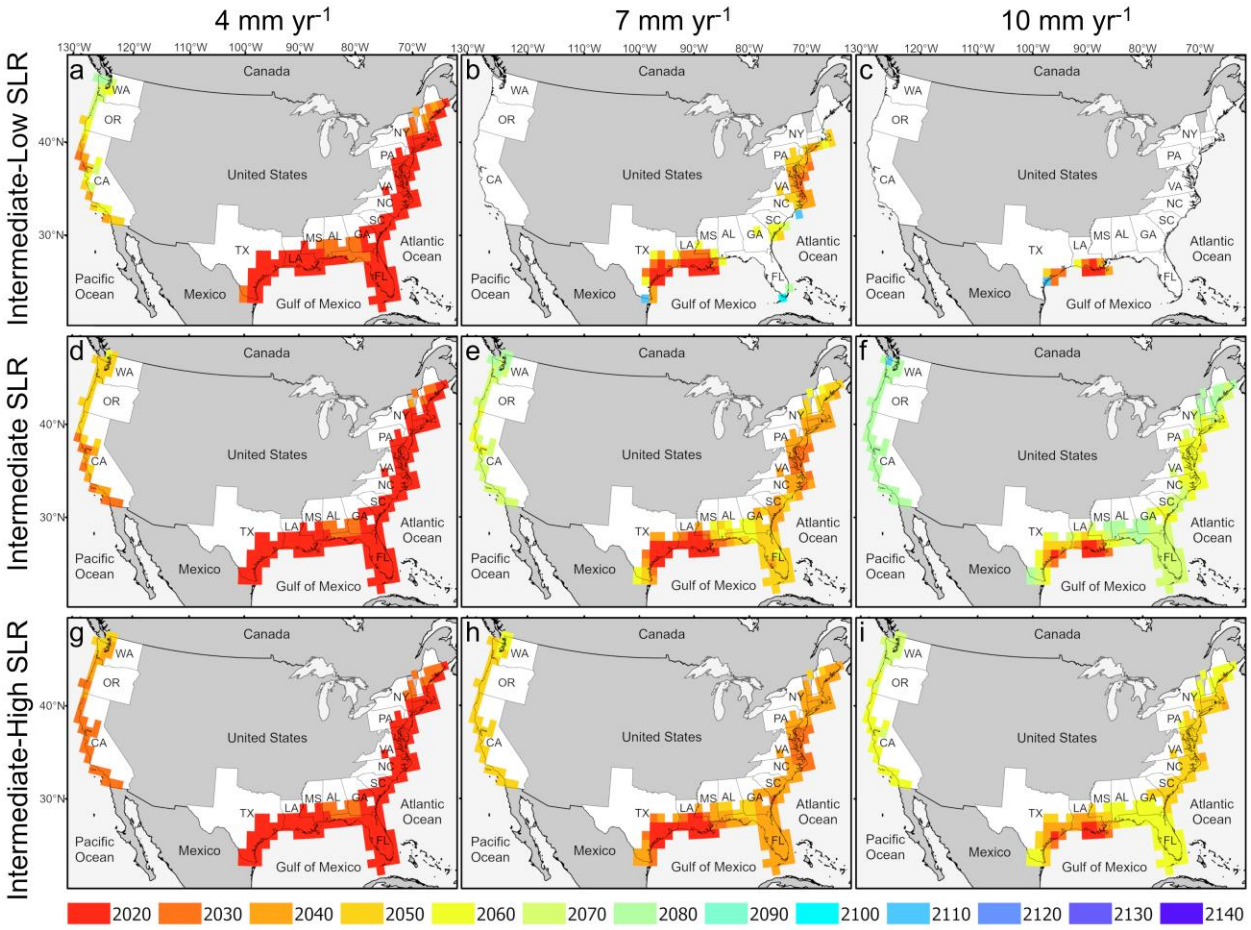
Supplementary Figure 1. Relative sea-level rise (SLR) rates for three alternative SLR scenarios for 4 of the 168 1-degree cells included in this study. The three horizontal lines show the 4, 7, and 10 mm yr^{-1} thresholds for initiating wetland drowning. Intermediate-Low corresponds with a 0.5 m GMSLR by 2100, Intermediate corresponds with a 1.0 m GMSLR by 2100, and Intermediate-High corresponds with a 1.5 GMSLR by 2100. GMSLR = global mean SLR.



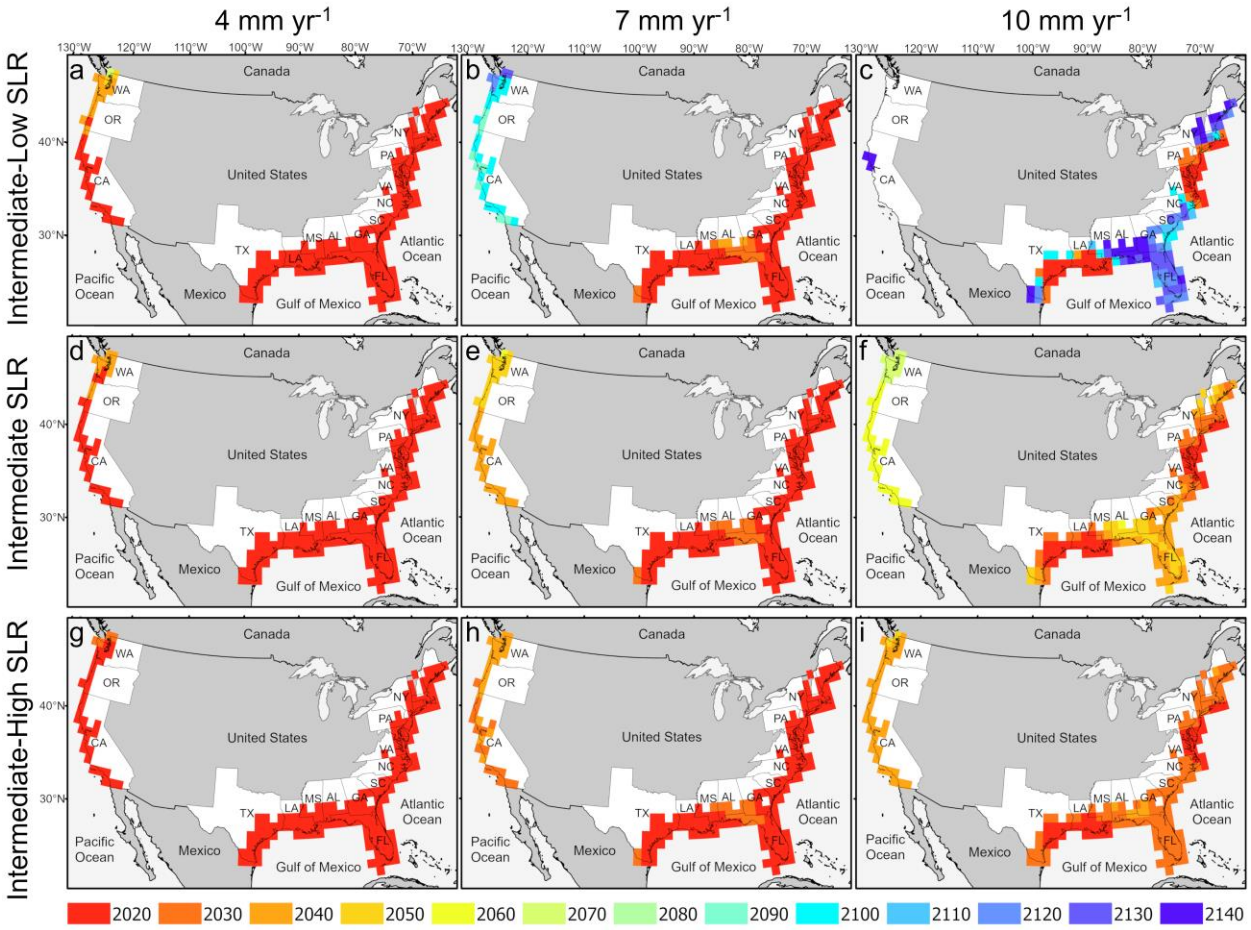
Supplementary Figure 2. The potential state-specific timing and extent of the start of coastal wetland drowning under alternative sea-level rise (SLR) scenarios and sensitivity thresholds for wetland drowning across the conterminous USA. Data are presented for 22 coastal states and Washington D.C. The y axes reflect the percent of coastal wetlands that could begin to drown on an areal basis. These are wetlands exposed to relative SLR rates that exceed thresholds for initiating coastal wetland drowning. Coastal wetlands in areas without bars (in B and C) are wetlands that have not begun to drown by 2140. For each panel, the SLR scenario and sensitivity threshold rates are shown on the right. Inter.-Low = Intermediate-Low (0.5 m GMSLR by 2100), Inter. = Intermediate (1.0 m GMSLR by 2100), Inter.-High = Intermediate-High (1.5 GMSLR by 2100). The loss and submergence of wetlands does not occur immediately once a drowning threshold has been crossed. Although some wetlands may drown within decades of crossing a threshold, others may persist longer. For area based analyses, see Figure 3. GMSLR = global mean SLR. The earliest possible date in our analysis is 2020. However, there are some areas, like Louisiana's Mississippi River Delta, where wetland drowning has already begun.



Supplementary Figure 3. Maps showing when coastal wetland drowning is expected to begin under alternative sensitivity thresholds for wetland drowning and sea-level rise (SLR) scenarios across the conterminous United States. Rather than the median sea-level rise projection, which is presented in Figure 1, these maps show the lower (17th) percentile for each scenario projection. Colors indicate the year in which wetland drowning is expected to begin. This is when rising sea levels are expected to cross thresholds for coastal wetland drowning. The loss and submergence of wetlands does not occur immediately once a drowning threshold has been crossed. Although some wetlands may drown within decades of crossing a threshold, others may persist longer. Intermediate-Low corresponds with a 0.5 m Global Mean SLR (GMSLR) by 2100, Intermediate corresponds with a 1.0 m GMSLR by 2100, and Intermediate-High corresponds with a 1.5 GMSLR by 2100. GMSLR = global mean SLR. Note that the earliest possible date in our analysis is 2020. However, there are some areas, like Louisiana's Mississippi River Delta, where wetland drowning has already begun. Base map layers are from publicly available U.S. Geological Survey datasets.



Supplementary Figure 4. Maps showing when coastal wetland drowning is expected to begin under alternative sensitivity thresholds for wetland drowning and sea-level rise (SLR) scenarios across the conterminous United States. Rather than the median sea-level rise projection, which is presented in Figure 1, these maps show the upper (83rd) percentile for each scenario projection. Colors indicate the year in which wetland drowning is expected to begin. This is when rising sea levels are expected to cross thresholds for coastal wetland drowning. The loss and submergence of wetlands does not occur immediately once a drowning threshold has been crossed. Although some wetlands may drown within decades of crossing a threshold, others may persist longer. Intermediate-Low corresponds with a 0.5 m Global Mean SLR (GMSLR) by 2100, Intermediate corresponds with a 1.0 m GMSLR by 2100, and Intermediate-High corresponds with a 1.5 GMSLR by 2100. GMSLR = global mean SLR. Note that the earliest possible date in our analysis is 2020. However, there are some areas, like Louisiana's Mississippi River Delta, where wetland drowning has already begun. Base map layers are from publicly available U.S. Geological Survey datasets.



Supplementary Figure 5. The potential timing of coastal wetlands crossing thresholds for initiating wetland drowning under alternative sea-level rise (SLR) scenarios and sensitivity thresholds for the conterminous USA. The y-axes reflect the coastal wetland area that could begin to drown. These are wetlands exposed to relative SLR rates that exceed thresholds for initiating coastal wetland drowning. Each of the symbols represents a 1-degree cell, and the plots include 168 1-degree cells distributed across the coastal conterminous United States. For each panel, the SLR scenario and sensitivity threshold rates are shown with text. Inter.-Low = Intermediate-Low (0.5 m GMSLR by 2100), Inter. = Intermediate (1.0 m GMSLR by 2100), Inter.-High = Intermediate-High (1.5 GMSLR by 2100). The loss and submergence of wetlands does not occur immediately once a drowning threshold has been crossed. Although some wetlands may drown within decades of crossing a threshold, others may persist longer. GMSLR = global mean SLR.