

Rapid Assessment of the Effects of Tropical Storm Alberto and Hurricane Beryl on Colonial Waterbird Nesting on the Mid and Lower Texas Coast, June-July 2024

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Background

Colonial-nesting waterbirds experienced Tropical Storm Alberto, which made landfall near Tampico, Mexico on June 20, and Hurricane Beryl, which made landfall near Matagorda, Texas on July 8 (Fig. 1). Tropical Storm Alberto had wide-ranging winds with a maximum sustained wind speed of 40 miles per hour coupled with the effects of high astronomical tide and 5 to 10 inches of rainfall. Tropical Storm Alberto caused storm surge of 1-4 feet along the Texas coasts north to Port O'Connor. The resulting high-water levels took roughly a week to recede (Fig 2).

In contrast, Hurricane Beryl made landfall on July 8 near Matagorda, Texas as a Category 1 hurricane, with maximum sustained winds of 80 miles per hour and a smaller spatial extent than that of Tropical Storm Alberto. Cumulative rainfall was 2 to 3 inches in the report area (Lavaca

Bay to Port Isabel, Texas). The hurricane caused surges over 5 feet near the location of landfall. Both wind speed and storm surge were more extreme from Hurricane Beryl than from Tropical Storm Alberto, but they were also more localized and of shorter duration. High waters receded within about two days, and the main surge was limited to the Texas coast north of Port O'Connor.

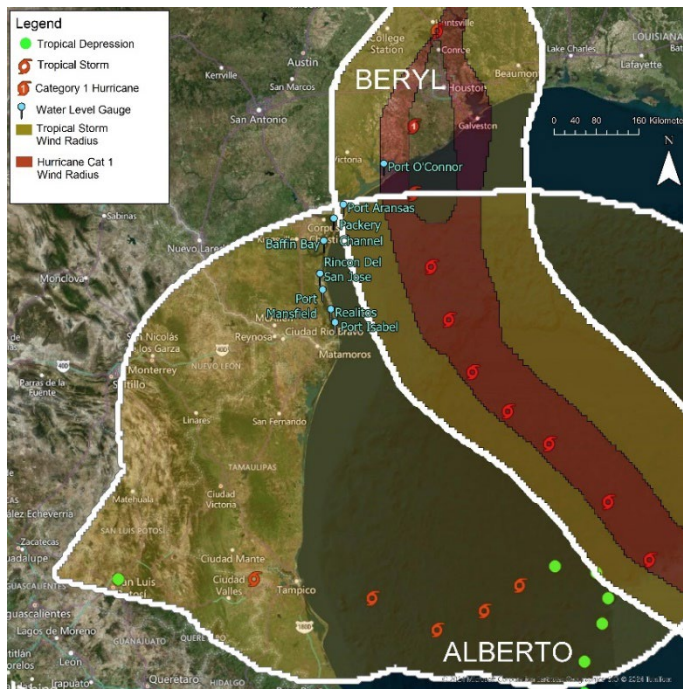


Figure 1. Paths of Tropical Storm Alberto and Hurricane Beryl with tropical storm force wind radius shown in yellow and hurricane force wind radius shown in red.

Personnel from the Coastal Bend Bays & Estuaries Program, the Harte Research Institute for Gulf of Mexico Studies at Texas A&M University Corpus Christi, and Texas A&M University Kingsville monitored colonial nesting waterbirds on colonies from Lavaca Bay to Port Isabel, Texas before and after the storms. Although the monitoring was not designed to quantify the effects of storms, the observations from experienced observers monitoring colonies were used to characterize the response of birds in our survey area only. Colony-specific observations are in the accompanying spreadsheet.

Summary

Tropical Storm Alberto

- The direct effect of Tropical Storm Alberto on most species of birds was from storm surge (Fig. 2), which varied with elevation of island and nest, and distance from the storm landfall. One notable exception was the Black Skimmer in the lower Laguna Madre where there were locally intense rain events closer to the storm's landfall. In that area, even the higher-elevation nests failed.
 - For most species, nests that failed appeared to have been inundated and were disturbed (Fig. 3). All Black Skimmer nests on low-elevation islands appeared to have failed, as did those of the Royal Tern.
 - Other ground-nesting species were further along in the nesting cycle and had mobile chicks that may have survived the storms by retreating to high elevation areas of the island. After the storm, Black Skimmers appeared to have re-nested at a few high elevation sites, such as the recently rehabilitated NE Mansfield Intersection Island.
- Wading birds were generally far along in the nesting period and had older chicks than other species. Nests in taller vegetation were largely intact and did not appear to be disarticulated by wind. For example, nearly all nests on Green Island and Pita Island / Humble Channel-b ("East Pita Island") survived.
 - Tree nesters on low elevation islands were usually successful except for those few nests that were located at very low elevations and placed in Prickly Pear Cactus, which were typically < 1 m tall (e.g., Pita Island / Humble Channel-d; Fig. 4)
- If chicks were old enough to be mobile, and there was a high elevation portion of the island, at least some appeared to have escaped inundation (Fig. 3d).

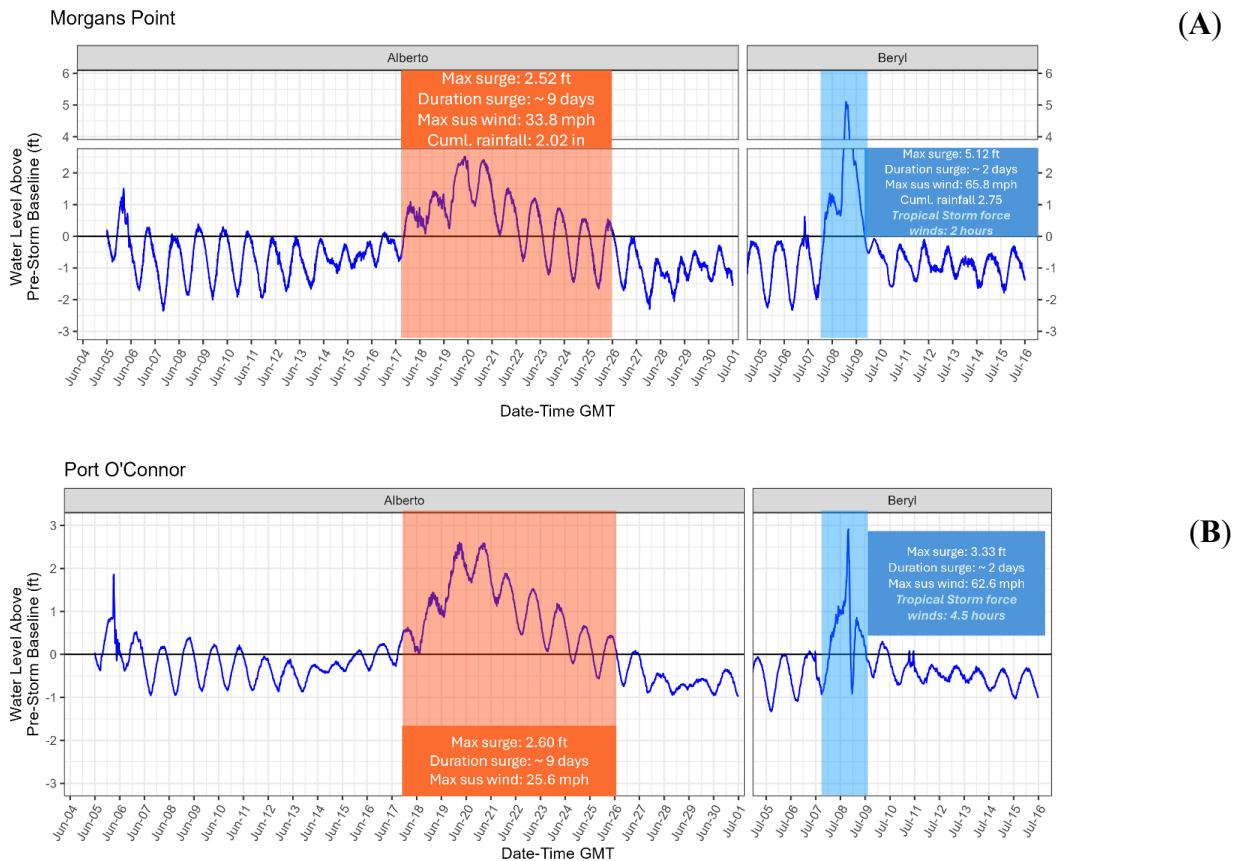
Hurricane Beryl

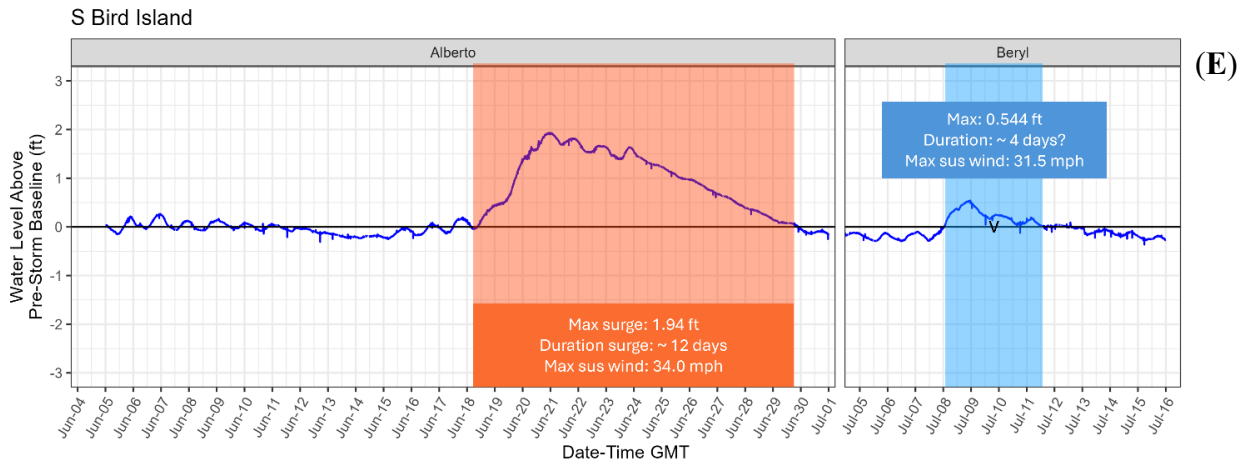
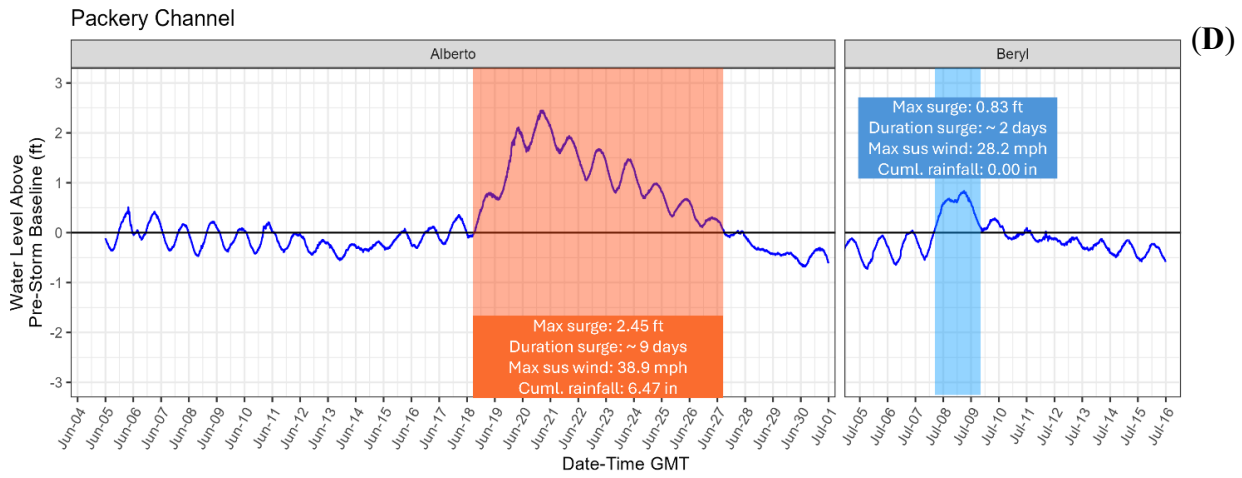
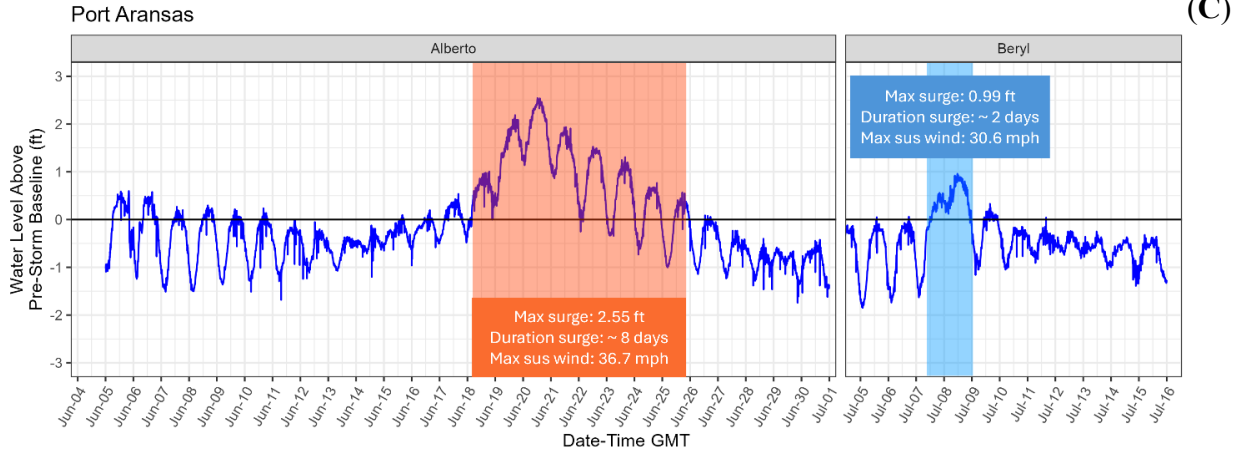
- The effects on nesting colonial waterbirds in the southern part of the report area were minor because winds were light and storm surge was low (Fig. 2) and most heron, spoonbill, ibis, and terns had ceased nesting after Tropical Storm Alberto.
- After Tropical Storm Alberto, there was a pulse of nest initiations by Black Skimmers on the high elevation island NE Mansfield Intersection Island. This pulse of late-nesting

attempts was likely birds that re-nested following the widespread failure from Tropical Storm Alberto. Black Skimmers continued to initiate nesting after Hurricane Beryl, with a peak of 667 nests detected on the survey 9 July 2024. Initially it seemed that the availability of a high elevation colony island allowed for re-nesting and may have reduced the negative effect from Hurricane Beryl. However, by the middle of August nearly all nests had failed on NE Mansfield Intersection Island, with avian predation pressure suspected as a likely cause. Small colonies reformed on islands scattered throughout the Upper Laguna Madre and one in Nueces Bay. Several had chicks approaching fledging age as of the third week of August.

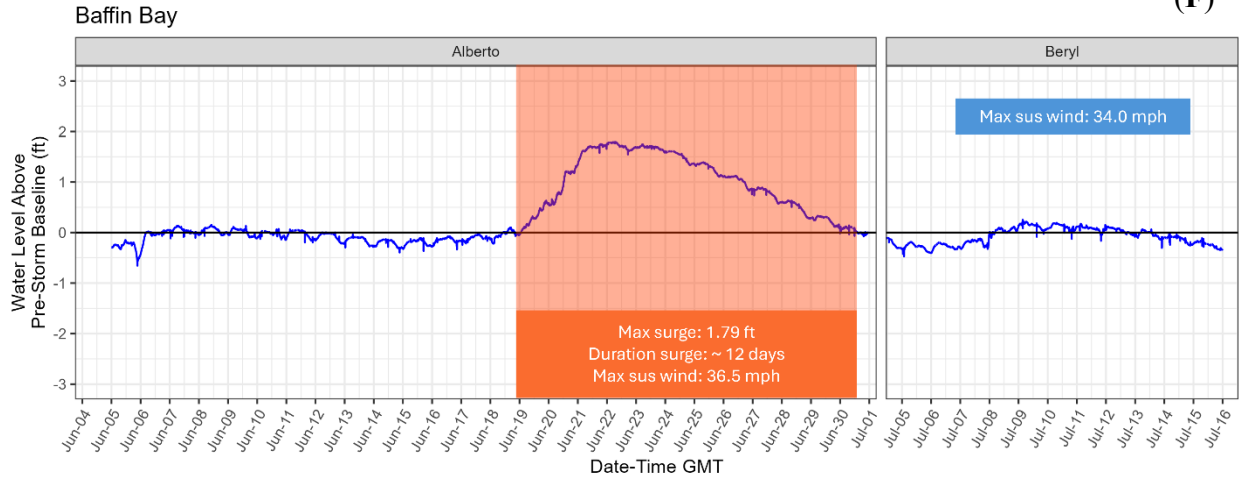
- The effects in the northern part of the report area were more severe than in the south, corresponding to the magnitude of wind and tidal surge. The combination of inundation and wind eroded islands and removed woody vegetation, which may not recover given the reduced island size, elevation, and loss of organic soil layer. (Fig 5). These effects on nesting substrate will likely have longer-lasting impacts to waterbird nesting at these locations than just a reduction in productivity for one season.

Figure 2. Effects of storm surge from Tropical Storm Alberto and Hurricane Beryl on water level above pre-storm baseline (ft) across various sites from the Texas coast, from the Upper Texas Coast at Galveston Bay (A) to near the mouth of the Rio Grande (J). The baseline is the gauge-specific mean of daily maxima for 9-15 June and 2-16 July for Tropical Storm Alberto and Hurricane Beryl, respectively. Data courtesy of NOAA’s Tides and Currents website.

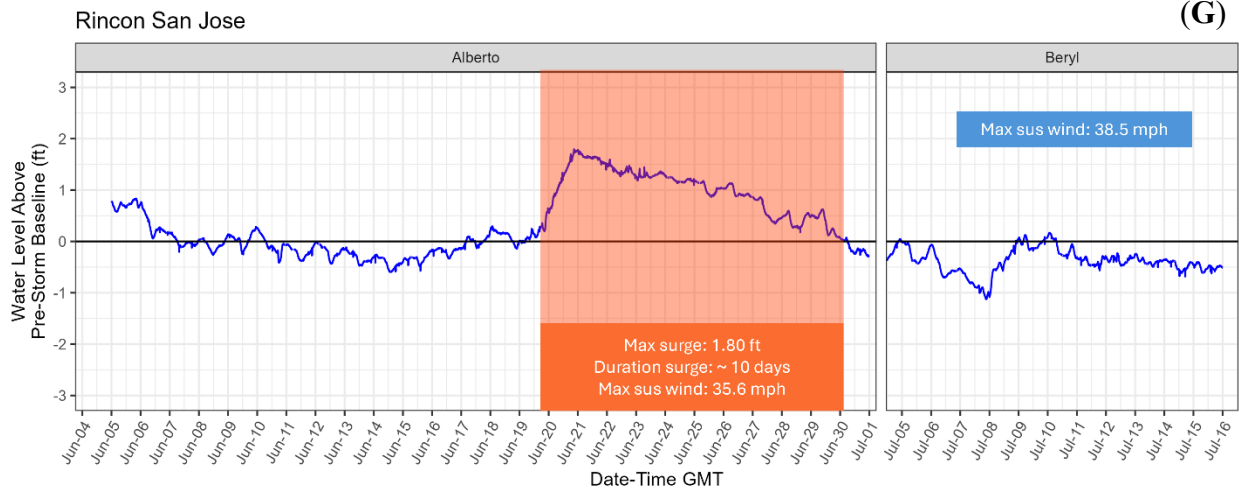




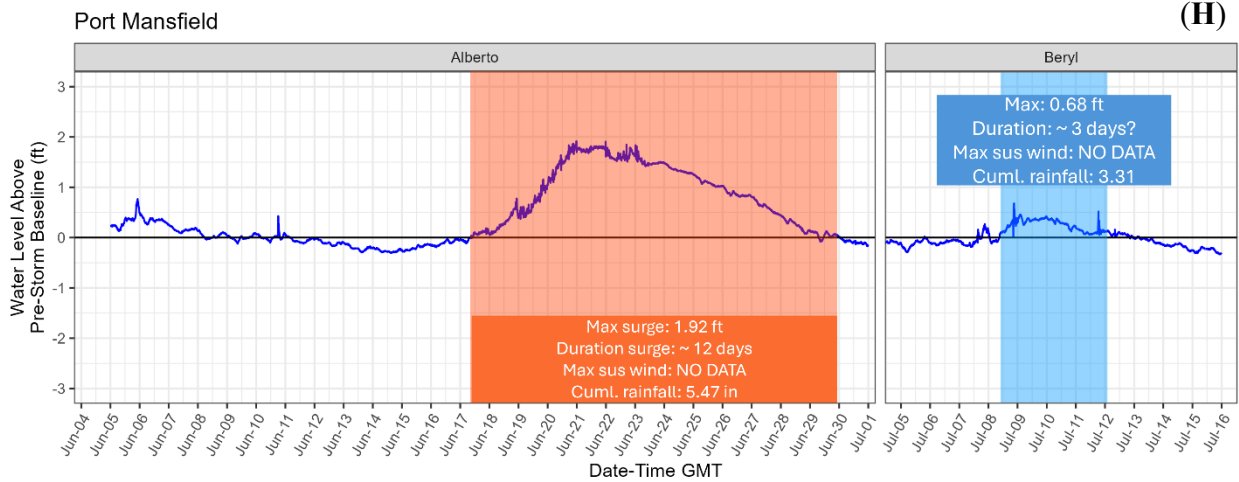
(F)



(G)

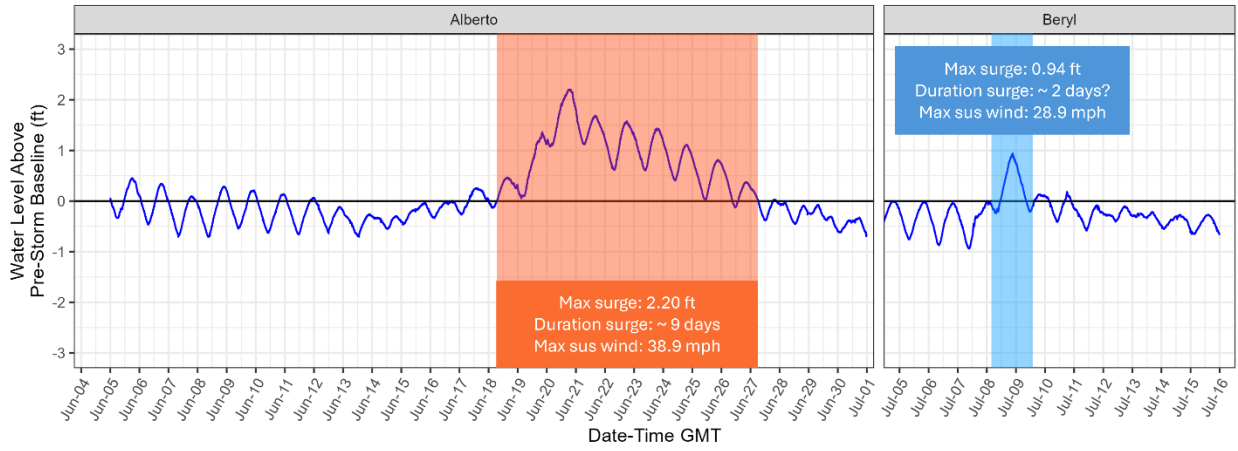


(H)



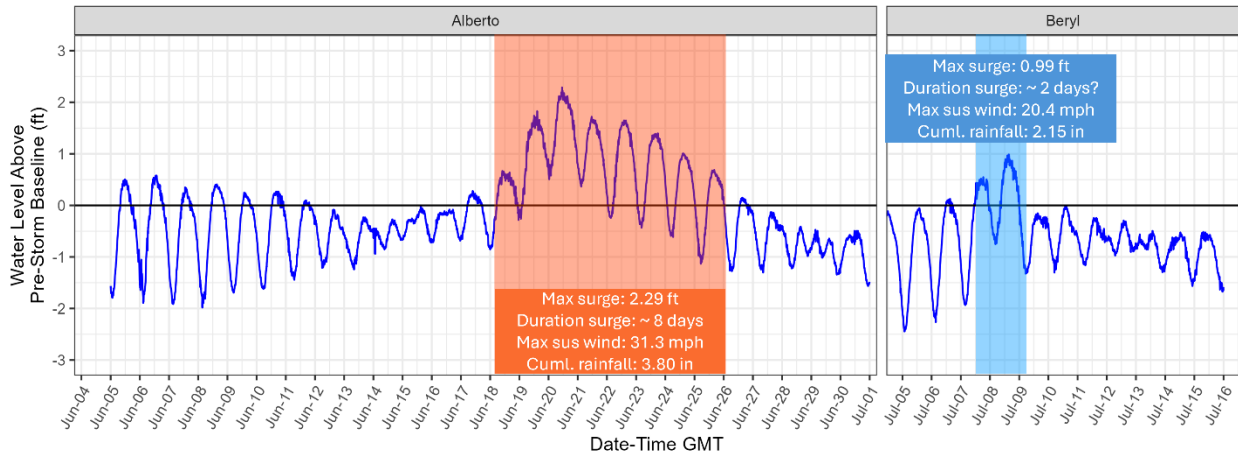
Realitos Peninsula

(I)



Port Isabel

(J)



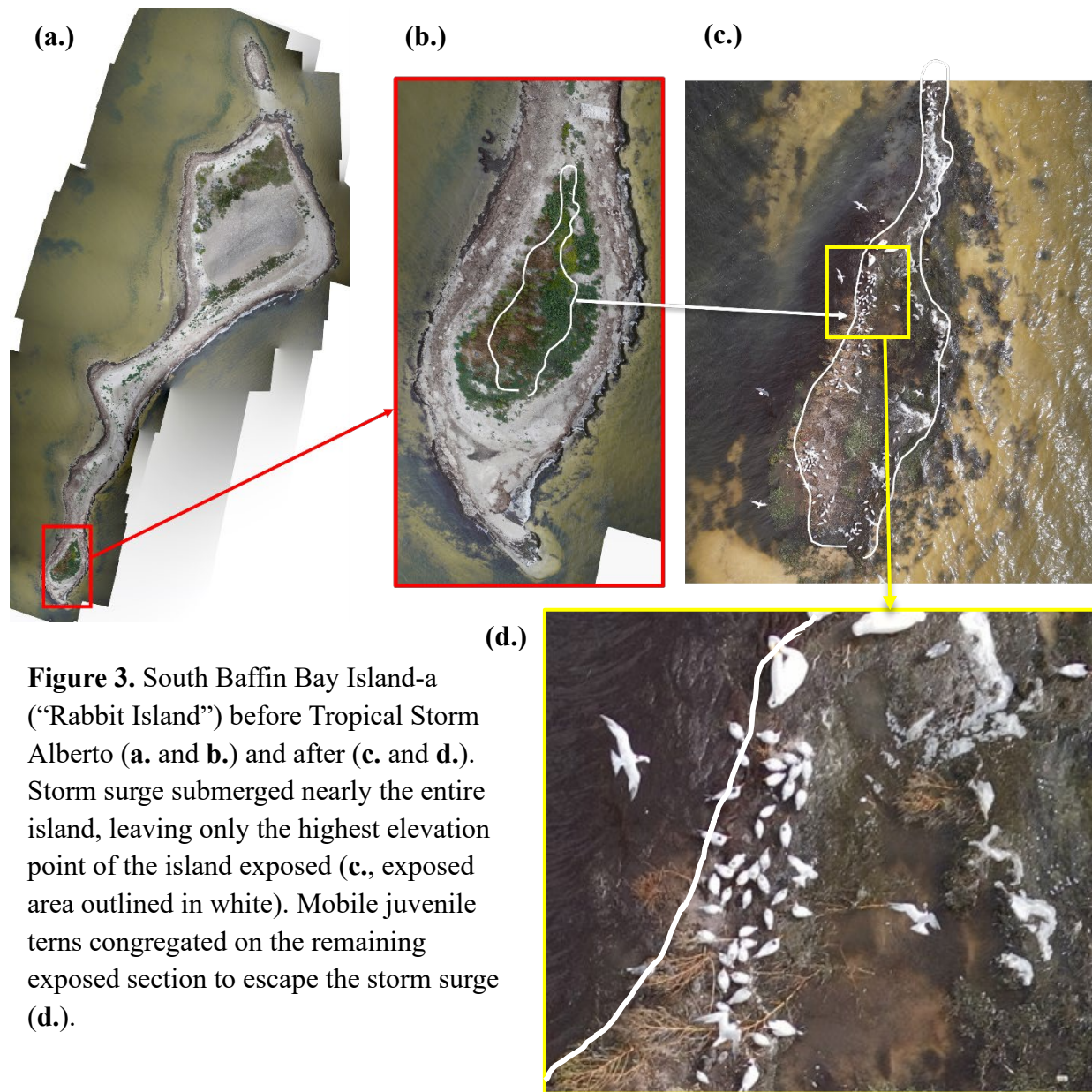


Figure 3. South Baffin Bay Island-a (“Rabbit Island”) before Tropical Storm Alberto (**a.** and **b.**) and after (**c.** and **d.**). Storm surge submerged nearly the entire island, leaving only the highest elevation point of the island exposed (**c.**, exposed area outlined in white). Mobile juvenile terns congregated on the remaining exposed section to escape the storm surge (**d.**).

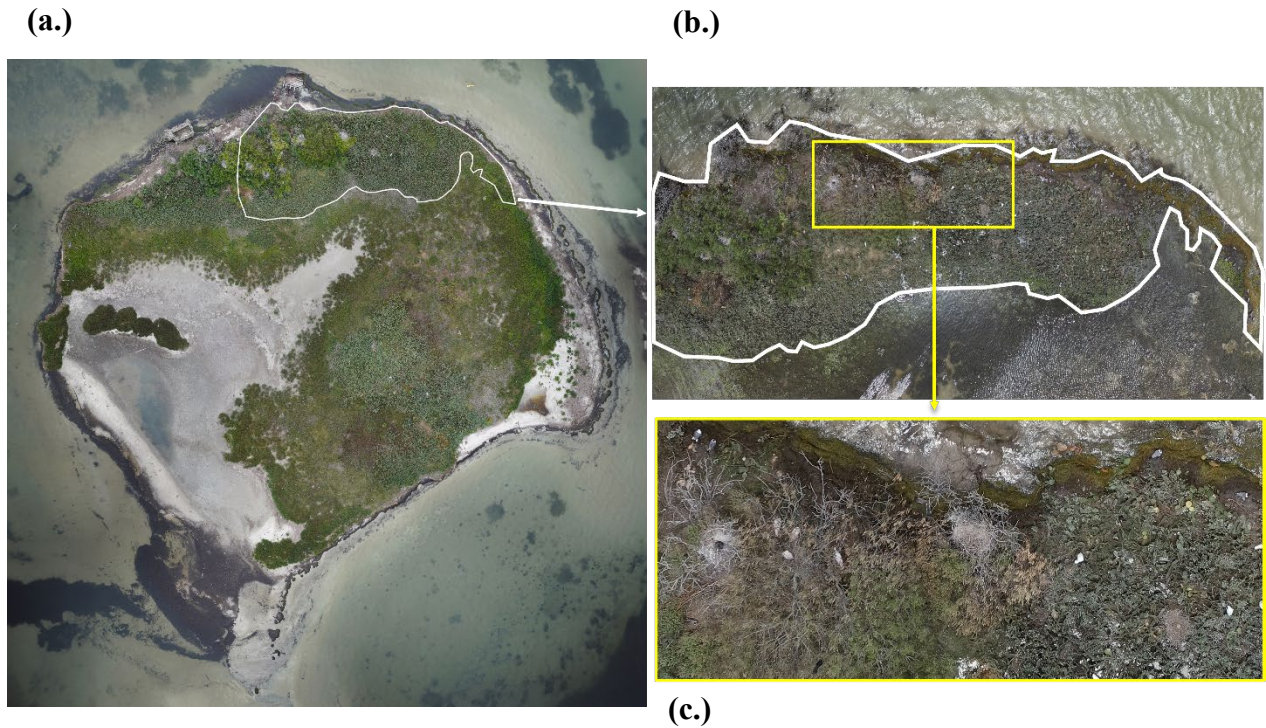


Figure 4. Pita Island / Humble Channel-d before (a.) and after (b.) storm surge associated with Tropical Storm Alberto, with the exposed section of the island highlighted in white. Wading bird nests elevated in vegetation were high enough to avoid submersion and some ground nests may have been spared in this section as well (c.), while all other nests on the island were subject to storm surge.



Figure 5. The damage to the Second Chain of Islands colony following Hurricane Beryl, including toppling of nesting structures on the right due to erosional undercutting, smothering of vegetation by shell material heaved onto the vegetated ridge, and damage to woody vegetation from saltwater inundation.

Appendix 1. Waterbird Nesting observations between pre and post Tropical Storm Alberto; Total nesting birds represents the total number of active waterbird nests observed; Qualitative observations refers to observations regarding the size, diversity, and a physical description of a colony island; Pre- and Post-storm Survey Date represents the most recent survey before and after the storm; Post-storm Observations are observations made in the most recent survey after the storm; Species abbreviations are Great Egret (GREG), Snowy Egret (SNEG), Reddish Egret (REEG), Tricolored Heron (TRHE), Little Blue Heron (LBHE), Great Blue Heron (GBHE), White Ibis (WHIB), Roseate Spoonbill (ROSP), Brown Pelican (BRPE), Neotropic Cormorant (NECO), Black Skimmer (BLSK), Sooty Tern (SOTE), Gull-billed Tern (GBTE), Royal Tern (ROYT), Sandwich Tern (SATE), and Caspian Tern (CATE).

Colony	Total Nesting Birds	Qualitative Observations	Pre-storm Survey Date	Post-storm Survey Date	Post-storm Observations	Bay
Rattlesnake Point	52	Mostly terns and BLSK on the spit coming off of the mainland. Nesting low so likely all inundated after Alberto.	5/21/2024	7/19/2024	BLSK have moved to one of the smaller islands. Island appears to have been washed over as substrate has shifted to form a higher ridge. 134 BLSK with 44 nests.	Copano
Chocolate Bayou	1795	Two nearby islands. Island along entrance channel was well vegetated with woody plants and supported hundreds of pairs of wading birds in recent years; brush included retama, mesquite, and other smaller brush species, and lower shelly shorelines supported ground nesters; the other island is a long shelly spit extending eastward from channel towards mainland with a small crown of halophytic forbs on the west end and a small brush motte on the far east end; one of the area's best colonies for ground-nesters including terns and BLSK	5/19/2024	7/31/2024	The vegetated portion of the channel island was severely impacted; all but a small (~40 sq m) patch of retama to 1-2m remains on the northern tip, all the rest having been washed away and replaced by a low shell ridge; halophytic forbs remain on scattered parts of island - about ten each of YOY (young of year) WHIB, ROSP and SNEG present suggest they survived through both inundation/storm events likely having come from the intact nests visible in the retama; the long shell spit that formerly supported large ground-nester colonies is degraded and now split in two between the eastern and western lobes - no apparent re-nest attempt by BLSK (zero present in area); not certain whether Alberto, Beryl or both caused the failure.	Lavaca
Second Chain of Islands	401	Most nesting on main island in mature mesquite scrub and amongst other upland vegetation; this consisted primarily of GREG and SNEG; small colony of 7 pairs CATE along northern shore; the other island is a low ridge where GBHE and GREG were nesting in low halophytic shrubs	5/28/2024	7/31/2024	Some GBHE YOY (young of year) still in nests on platforms and higher vegetation of main island, no other evidence of nesting birds; two constructed platforms toppled by being undercut by erosion suggesting significant shoreline loss; signage intact; no evidence of nesting remaining on smaller low island to east	Ayres
Cape Carlos Dugout	23	All nesting on the island was GBHE, about a third of which were on the constructed nesting platforms with remainder in low scrubby wolfberry (<i>Lycium carolinium</i>) and marsh-alder (<i>Iva frutescens</i>) and other low forbs	5/28/2024	7/31/2024	All woody vegetation is dead and island eroded to clay base on north end; platforms still standing apparently unimpacted by surge or waves, and signage intact	Carlos
Salt Lake B	9	Fairly low-lying island. TRHE nesting low.	5/21/2024	7/19/2024	No species on this island.	Salt Lake
Salt Lake A	19	BLSK, terns, and herons. Herons in nesting towers. It is likely the edges and possibly the whole island got washed over.	5/21/2024	7/19/2024	Only one heron nest still active. It is likely the BLSK and terns got washed out.	Salt Lake
Salt Lake C	38	Fairly low-lying with a very low sand area that BLSK use. TRHE on top in small shrubs.	5/21/2024	7/19/2024	BLSK and TRHE on nest, so it is likely they lost their first nests due to storm surge. No chicks.	Salt Lake
Salt Lake D	54	Mostly LAGU with some herons. Fairly low.	5/21/2024	7/19/2024	Only TRHE nesting now so I assume they lost their first nesting attempt and the gulls got washed out.	Salt Lake
Salt Lake E	82	LAGU, terns, and BLSK in the lower areas with herons in shrubs or on towers.	5/21/2024	7/19/2024	Only TRHE nesting now so I assume they lost their first nesting attempt and the gulls, terns, and BLSK got washed out.	Salt Lake

Salt Lake G	68	BLSK, gulls, and terns nesting low with TRHE nesting higher. Higher island but very close to land. Unsure if it was overwashed.	5/21/2024	7/19/2024	8 TRHE nests - unsure if late nesters or renesters.	Salt Lake
Salt Lake F	264	Small island with higher ridge down middle. BLSK and terns nesting in lower-lying areas. TRHE up a little higher. Likely got overwashed.	5/21/2024	7/19/2024	83 BLSK nests, 26 TRHE nests. No chicks. Second attempt.	Salt Lake
Little Bay (a through c)	591	Most of the small wading birds nest in low vegetation (<i>Distichlis</i> , <i>Borrchia</i> , <i>Opuntia</i>) so if Alberto surge came up enough it may have wiped out most nests though hatchlings might have been able to clamber to higher ground.	5/21/2024	7/17/2024	Chicks of wading birds present and some YOY (Young of Year) gulls; less TRHE and REEG chicks than expected and no small ones so possibly many nests lost near edges in Alberto. Few LAGU on nests or with chicks on island but anything surviving Alberto might have already fledged and be part of the cove flock	Little Bay
Rockport Beach	469	Many BLSK and LAGU, with herons nesting in the shrubs. Low-lying and likely to have been washed over during Alberto.	5/21/2024	7/17/2024	No chicks and confirmed area underwater so complete washout of nesting BLSK. ~160 still in park, only 25 on nesting area with 9 sitting (possible re-nesting) and a larger group in parking lot by saltwater pool, several in scrapes but nesting not likely; many gull chicks in cove (chicks that were mobile during surge likely moved to higher ground) but less than 10 TRHE chicks; a few TRHE may be trying to re-nest	Little Bay
Big Bayou Spoil	1	Small island with nesting towers and prickly pear. GBHE typically nest on both. Chicks and fledglings walking around. Likely got partially washed over or received wave action.	5/29/2024	7/18/2024	Few fledglings observed. Prickly pear looked washed over.	Redfish
Hog Island Complex	436	High, large mangrove island. Many TRHE, as well as ROSP, egrets, and other herons.	5/29/2024	7/18/2024	It's possible the lowest nests got washed out but there were large numbers of fledglings of many species present in July.	Redfish
Redfish Causeway Platform N	9	Small mangrove island chain with herons and egrets.	5/29/2024	7/18/2024	No birds but they likely all fledged already.	Redfish
Unnamed Island South of Redfish Causeway Platform S	19	Small mangrove island with nesting herons and egrets. Likely did not get overwashed during Alberto.	5/29/2024	7/18/2024	Fledglings of several species were observed on the island but it is likely nesting concluded a while ago.	Redfish
Nueces Marsh Restoration	4219	Majority of the count was LAGU. Nesting in the veg on the east side were smaller egrets and herons. BLSK and terns were nesting on the lower, drier islands.	5/20/2024	6/25/2024	The smaller egrets and herons were likely just high enough to survive the surge; several nests with chicks were observed. No BLSK or tern nests or chicks were found. The LAGU seemed to fare well - it is likely their chicks were large enough to swim to higher ground when necessary - all of the chicks observed (480) were close to fledging age.	Nueces
Nueces Island 3	83	Mostly LAGU with a few herons. The island was recently restored to over 4 ft in height, although it appears the storm surge/waves washed over the island.	5/20/2024	6/25/2024	The GBHE in the nesting towers were unaffected, however, no ground- or low-nesting species were seen.	Nueces
Nueces Island 1	114	Many GREG nesting as well as some great blues in the nesting towers. Island was recently restored to over 4 ft in height, though it likely was partially overwashed or received wave action during Alberto.	5/20/2024	6/25/2024	It is likely neither species were affected as the chicks should have all been of a size where they could move to the highest area of the island. We found many GREG chicks and fledglings after Alberto. Similarly, the GBHE chicks in the nesting towers would have not been affected by the surge.	Nueces
Nueces New Island	211	Many BLSK and terns were nesting in the low, middle part of the island. It is highly likely the storm surge inundated the site through the break in the rock wall. Many GBHE were nesting in the towers but they were nesting down lower in the rock wall as well.	5/20/2024	6/25/2024	No BLSK or terns remained after Alberto. Few heron and egret fledglings were seen around the island, and a few heron nests were still active in the towers.	Nueces
East Shore Spoils A	6	GBHE nesting high up in the trees and on top of prickly pear. Likely not affected by storm surge.	5/29/2024	7/18/2024	One GBHE and one GREG on a nest.	Redfish

Nueces Rivermouth	151	Mostly BLSK with some terns along the main ridge, with a few herons and egrets in the motte at the point. Likely the whole area was inundated except the point.	5/20/2024	6/25/2024	No species were at the site after Alberto.	Nueces
East Shore Spoils D	35	Hérons and egrets nesting in mangroves, with a few ground nesters in the low-lying area.	5/29/2024	7/18/2024	Only one heron nest still active. The others could have hatched and fledged by now.	Redfish
Pelican Island	107	Hérons, egrets, and ROSP nesting high in the trees. Unlikely to have been affected by Alberto.	5/29/2024	7/19/2024	A few adults hanging around but no nests. It is likely all the nesting had been completed by this time.	Corpus Christi
Shamrock Island	NA	Island has large diversity of herons (GREG, REEG, GBHE, LBHE, TRHE, SNEG), LAGU, BRPE, WHIB, and several tern species (CATE, ROYT, SATE, GBTE, SOTE, FOTE) nesting throughout island; very large island with higher elevation throughout island, but low elevation strips of sand on southwestern and southeastern edge; most terns and all BLSK have selected nesting habitat on the southern and southwestern sections of the islands which were largely spared from inundation during Alberto)	6/1/2024	6/24/2024	Few active heron nests, > 500 active BRPE nests, no BLSK nests, < 100 active tern nests including 4 newly constructed SOTE nests, CATEs initiated nesting early in the season and had largely fledged chicks by the date of the storm; > 2000 active LAGU nests; > 1500 tern chicks, < 5 BLSK chicks, > 500 WHIB chicks, > 2000 BRPE chicks, > 1000 heron chicks	Corpus Christi Bay
Oso Bay - B	153	Mostly BLSK with some GBTE. Island is low-lying and would have been completely washed over during Alberto.	5/31/2024	6/21/2024	No species were at the site after Alberto.	Oso
Oso Bay - A	13	GBHE only. Many chicks and fledglings so they were likely finished nesting by the time Alberto hit. Island is very low and was completely washed over.	5/31/2024	6/21/2024	A few adults were on the island after the storm but no nests or young were seen. They likely were already fledged.	Oso
Tern Island	52	Hérons, egrets, and spoonbills nesting high. As tall as the island is, a majority was underwater.	4/29/2024	6/27/2024	Fledglings of several species were seen, as well as nests. It is likely low-lying nests were flooded out and only those at the very top survived.	Upper Laguna
Humble Island	56	Gulls and great blues. It is likely this island was mostly submerged during storm surge.	4/29/2024	6/27/2024	No species were present after Alberto.	Upper Laguna
ZigZag	669	Hundreds of gulls and terns nesting, few great blues. Likely hatched before Alberto and could survive if large enough to float around or find higher ground.	4/29/2024	6/27/2024	250 ROYT chicks and 38 gull chicks present post-Alberto. They likely were old enough to survive the surge. Any nests would have been wiped out.	Upper Laguna
Pita Island / Humble Channel (l)	4967	Island has large diversity of nesting herons (GREG, REEG, GBHE, LBHE, TRHE, SNEG), WHIB, and LAGU; no terns or BLSK observed nesting; large island with low elevation on sandy edge of island, but higher elevation throughout island center	5/31/2024	6/22/2024	Nesting appears to have slowed down considerably and ~ 25 active heron and WHIB nests observed on island, but almost all with older chicks; many LAGU nests still active on island; ~ 200 heron chicks, ~ 3000 LAGU chicks, ~ 300 WHIB chicks observed on island, > 30 ROSP chicks	Upper Laguna
Pita Island / Humble Channel (d)	864	Island has large diversity of nesting herons (GREG, REEG, GBHE, LBHE, TRHE, SNEG), many LAGU, and no terns or BLSK; very small island with higher elevation throughout entire island excluding the sandy section on the east	5/31/2024	6/22/2024	Very few active heron nests, and all have larger chicks; ~ 20 REEG chicks, ~ 50 GREG chicks, > 25 GBHE chicks, > 750 LAGU chicks, > 4 TRHE chicks	Upper Laguna
Pita Island / Humble Channel (b)	832	Island has large diversity of nesting herons (GREG, REEG, GBHE, TRHE, SNEG), many LAGU, and several terns (CATE, SATE) nesting on sandy edge of island; very small island with higher elevation in northern section and low elevation throughout remainder of island	5/31/2024	6/22/2024	No active heron nests observed; several active LAGU nests observed, but only in small area not inundated in water, > 30 REEG chicks, > 30 TRHE chicks, > 5 SNEG, > 25 ROSP chicks, > 500 LAGU chicks; all remaining chicks of all species have moved into higher elevation area near the northcentral section of the island	Upper Laguna
Marker 103-117 Spoil (NM 207-221) (a)	788	Primarily composed of ground nesting species (BLSK/ROYT/GBTE) with herons (REEG/SNEG/GREG/TRHE) occupying higher ground; moderately sized island with low elevation on sandy edge and higher elevation towards island center	5/28/2024	6/22/2024	No tern or BLSK nests and/or chicks observed; 4 GREG chicks observed and several dead REEG, and GREG observed (likely disease outbreak reported by researchers from TAMUK). Approximately 20 BLSK re-initiated post-Alberto with most nests producing chicks as of August 5.	Baffin Bay
South Baffin Bay Island (a)	337	Primarily composed of ground nesting species (BLSK/ROYT/CATE/GBTE), although several herons (GBHE/REEG) nested in standing platforms and the small portion of vegetation on island; small island with very low elevation throughout colony	5/28/2024	6/22/2024	No active nests were observed; no BLSK chicks observed; ~ 3 dozen tern chicks crammed into the few square meters of remaining land	Baffin Bay
South Baffin Bay Island (b)	22	Only composed of CATE, BLSK and LAGU; very small island with very low elevation throughout colony	5/28/2024	6/22/2024	No active nests observed; only 2 LAGU chicks and 2 CATE chicks observed on highest point of island	Baffin Bay
East Marker 265	13	Island has very low diversity with several herons and a few gulls; small island with very low elevation throughout.	5/28/2024	6/25/2024	No active nests on island; 4 LAGU chicks, 2 GBHE chicks. Likely mostly overwashed during Alberto.	Lower Laguna

NE Mansfield int	3638	Primarily composed of ground nesting species (BLSK and terns) with a handful of herons occupying veg; very large island fully enclosed with rock revetment and minimum of about 1.5ft above sea level, increasing to 15+ feet; there is an inlet that is open to the Laguna on the SE section of the island that let in water during the storm which inundated anything near the inlet and along nearly the entire eastern edge of the island; the interior of the island has a large sandy hill that birds began nesting on exclusively after the storm	5/28/2024	6/25/2024	Majority of terns appear to have either successfully hatched chicks pre-storm or endured through the rains with ~2200 ROYT/SATE/CATE chicks present. Some amount of BLSK nests were likely washed out by heavy rains and wind however (nearly all located along the slope of the upper parts of the island, well above the storm tide line), with 350 nests still present in late June but no chicks yet. Nearly 400 nests and yet still no chicks present by 19 July, so rains before and after Hurricane Beryl may have continued to wash out some number of nests. Post-Beryl BLSK nest numbers peaked at 667 on 29 July, but by 2 August, most of the nests had failed for unknown reasons. As of 5 August, only 28 active BLSK nests remained.	Lower Laguna
Green Hill Spoils Island (A and B)	33	Colony entirely composed of shrub/tree nesters - no ground nesters. Nesting waders here mostly already in the chick stage by the end of May, so less active nests than perhaps expected.	5/28/2024	6/25/2024	Wading birds likely mostly unscathed from storm. Low numbers seen post survey not surprising as the colony had already fledged most chicks at this point.	Lower Laguna
Green Island Spoils (a through h)	769	Primarily composed of terns (CATE, ROYT) and LAGU, with a few herons (GBHE, REEG) nesting in vegetated interior; very small islands with relatively high elevation throughout; most of the islands are made from clay and each island rises out of the islands at a steeper degree than other islands surveyed (this creates a steeper gradient for several of the islands).	6/2/2024	6/25/2024	Some islands likely nearly or fully inundated, though higher ground available on most for chicks to shelter on - most nests likely hatched pre-storm or made it through. Post survey found few nests active but >500 LAGU/ROYT/CATE chicks continuing.	Lower Laguna
Green Island	1227	Primarily composed of herons (GREG, REEG, GBHE, TRHE, SNEG), WHIB, and NECO, and no terns or BLSK observed nesting; very large island with very high elevation throughout; the majority of nesting habitat on the island is composed of woody plants and cacti; almost the entirety of areas used for nesting on the island have a pronounced canopy	5/30/2024	6/25/2024	Few active heron nests observed, several dozen WHIB nests observed, around two dozen GREG/REEG/TRHE nests observed (most with small chicks); > 200 REEG chicks, > 150 GREG chicks, > 150 ROYP chicks, > 50 WHIB chicks, > 100 GBHE chicks. Likely little impact from storms this year due to the high elevation and dense shrubbery throughout.	Lower Laguna
Arroyo Y Spoil	591	Full mix of wading birds and ground nesters (mostly LAGU as well as BLSK and GBTE) here, with the terns mostly up on a relatively high bare ridge well above tide line. BLSK still setting up and only on 18 nests despite nearly 200 adults present. Waders here also mostly in chick stage by end of May.	5/28/2024	6/25/2024	Lower parts of island certainly flooded out but ridge with BLSK would have mostly remained above tide line, though 140 pairs with only 55 nests and no chicks indicates a significant loss in nests from strong rain/wind is likely. Wading birds in shrubs/trees mostly unscathed from this storm.	Lower Laguna
Laguna Vista Spoils	2082	Full mix of wading birds and ground nesters of nearly all local species. Waders mostly up high in brush. Again, most waders mainly already in chick stage (including BRPEs which nest mainly on the ground). LAGU and ROYT/CATEs mostly mixed between nest and chick stage, while BLSK just barely setting up on nests (40 nests).	5/31/2024	7/9/2024	Tide would have completely covered up any bare ground on the island and come up into some of the vegetated areas. BLSK colony and many remaining terns/gulls certainly overwashed, but anything with chicks already hatched could have made it to higher ground. Post-survey found only 40 BLSK with 10 nests and no chicks, but 350+ ROYT chicks still alive and well. BRPE also with mostly nearly fledged chicks. Waders probably mostly unscathed from storm.	Lower Laguna
The Shores (SPI housing development)	864	Colony is on artificial "island" designed for future condominium construction 3 feet above water level with metal retaining wall all around. Colony is comprised mainly of LAGU along with >120 BLSK pairs and a few waterbirds.	5/31/2024	7/9/2024	Tide likely didn't rise high enough to inundate but area likely still received at least several inches of rain in a short period in addition to 30-40mph winds. LAGU mostly attending to chicks but only a couple BLSK chicks observed along with 160 nests, so BLSK likely lost many nests in the rains of the storm and had to re-nest.	Lower Laguna

Dead Pecker Hill	642	Colony composed of waders up in 3-6foot-tall black mangroves and >200 BLSK pairs on very low bare ground at waters edge. BLSK colony occasionally partially or fully washed out in seasons with slight abnormal high tides.	5/31/2024	7/9/2024	Any soil on island likely underwater for several days at least. BLSK colony on low ground entirely absent from island. Most waders probably unphased by 2 foot tides here, though lower nesting species like TRHE may have been affected and nearly 100 were still seen on nests or small chicks whereas most other waders only with larger chicks or fledglings.	Lower Laguna
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