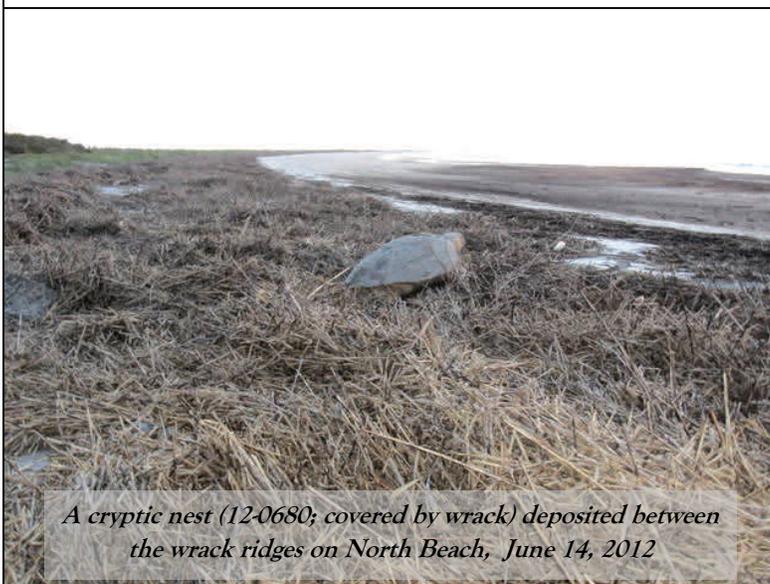




Wrack washing in on beach accumulating as small clumps that will wash ashore to accumulate as a wrack mat on June 16, 2012

massive accumulations along the shores of the barrier islands in aggregates called *wrack mats*. Wide and thick rack mats accumulated along all the beaches of the Georgia barrier islands, including St. Catherines Island. The *Spartina* wrack mat formation was followed by yet another event, the washing in of tons of floating algae, *Sargassum*, apparently from an eddy of the Gulf Stream on June 22, 2012.

These conditions have undoubtedly been experienced many times in the past and were earlier documented on St. Catherines Island in 2010 in a Senior Thesis by Upper Iowa University Sea Turtle Intern Alyse Eddy (Eddy, 2010) when anomalously high tides hit the Georgia Coast, bringing in large rafts of *Spartina* from the back-barrier marshes. Eddy's observations in 2010 indicated that extensive wrack mats inhibited, *or even countermanded nesting*, by loggerhead sea turtles as was indicated by an increasing non-nesting to nesting crawlway ratio (NN/N) and even a sequence of "missing" nests during the event in 2010. Normal NN/N ratios for Georgia are 1:1 for most islands most seasons and normally higher, 2:1 for St. Catherines Island, due to the highly erosional condition of our Sentential Island.



A cryptic nest (12-0680; covered by wrack) deposited between the wrack ridges on North Beach, June 14, 2012

A Wrack-y Summer

By Gale Bishop; Director SCISTP

During 2012, three or four storms occurred producing higher than normal tidal events that floated massive quantities of dead plant debris, mostly Salt Cord Grass (*Spartina*), out of the Marshes on the Georgia Coast. These extensive masses of marsh plant debris floated out of the marshes, were carried through tidal creeks and rivers through the sounds into the Atlantic Ocean; and then washed ashore with on-shore winds. The *Spartina* detritus accumulated as



The wrack mat along Seaside Spit on North Beach, blocking loggerhead nesting access to the beach along one of the highest quality loggerhead nesting habitats on St. Catherines Island

Nesting sea turtles often encounter obstructions, such as wrack, as they attempt to nest resulting in chaotic nesting behaviors; this results in complex, obstructed nests, clutches of eggs often placed in odd places, and often covered with anomalously thin bioturbated covering layers. Turtles nesting in sand overlying buried wrack mats or in the wrack mat overlying beach sand, usually complete their nesting ethogram as described by Hailman and Elowson in 1992; however, the presence of the wrack mat interferes significantly with nesting activity, often causing the egg chamber to be isolated from the covering pit, underlying the turtle's crawlway, or even be deposited in, or under the surrounding wrack mat. These chaotic, shallow nests are often easy prey for raccoons but difficult for humans to locate due to lack of visual clues. Hatchling turtles are often trapped beneath the wrack mat and may be unable to reach the surface," (see Bishop, Pirkle, Meyer, and Pirkle, 2011: 260 & Fig 13.5b).



The 2012 Sea Turtle Interns, Michael Samiratedu, Katie Wakefield, and Katie Ortiz explaining the obstructed nests on North Beach to the students of the College of Coastal Georgia: Education for Sustainability (EIS) Summer Teaching Institute on June 13, 2012.

The extensive wide and widely distributed wrack mats of 2012 have led to the recognition a new category of obstructed, complex loggerhead sea turtle nests, called **cryptic nests**. *Cryptic nests are nests that not only are obstructed and inhibited by beach impediments, but because of them, in this case because of extensive wrack, are nearly hidden to casual surface observation.* This is indicated by soaring NN/N ratios that have often exceeded 5:1 during this summer; it has simply been very difficult for our turtles to find a place to nest within the wrack ridges bordering St. Catherines' beaches.

In science, the appearance of a "new" problem provides opportunity to learn to solve it. Extensive wrack mats inhibiting nesting by loggerhead sea turtles forced the Turtle Team in 2012 to reassess the reading of wrack-obstructed nests; leading to the concept of cryptic nests and to a much more refined process of searching for nests hidden within wrack mats.

Wrack mats also seriously are also impeding hatchlings in crawling to the sea, slowing their progress so they become

easier depredation targets for ghost crabs, birds, raccoons, and hogs, or even completely block their access to the sea. To mitigate this, Superintendent Royce Hayes empowered SCIF Staff Member Alan Dean to construct approximately 25 "**Pathways to the Sea**" through the wrack mats at strategic locations using a Ford 3200 Tractor and a box-blade, opening ramps to the sea for clusters of nests on North and South Beach.

The predictive outcome of so many cryptic nests is that we expect to see more than the usual numbers of "wild nests," those nests that were not found during normal morning patrols, but are identified by "surprise" appearance of hatchling crawlways coming from beneath the wrack. On the night of July 25/26 the first Wild nest of the 2012 season was reported by Guinnessa Maher at Sand Pit Road Entrance.



Alan Dean scraping "Pathways to the Sea" through the wide and thick wrack mats at McQueen Dune Field, South Beach, St. Catherines Island.

Graph Below: The increasing and abnormally high ratio of non-nesting to nesting crawlways during 2012 reflects the difficulty loggerhead sea turtles have had with finding a good place to nest on St. Catherines Island beaches.

