



Figure 4. Tracks of all hurricanes passing within 100 km of St. George Island from 1851 to 2005 (total of 42). Source: NOAA Coastal Services Center, <http://maps.csc.noaa.gov/hurricanes/viewer.html>.

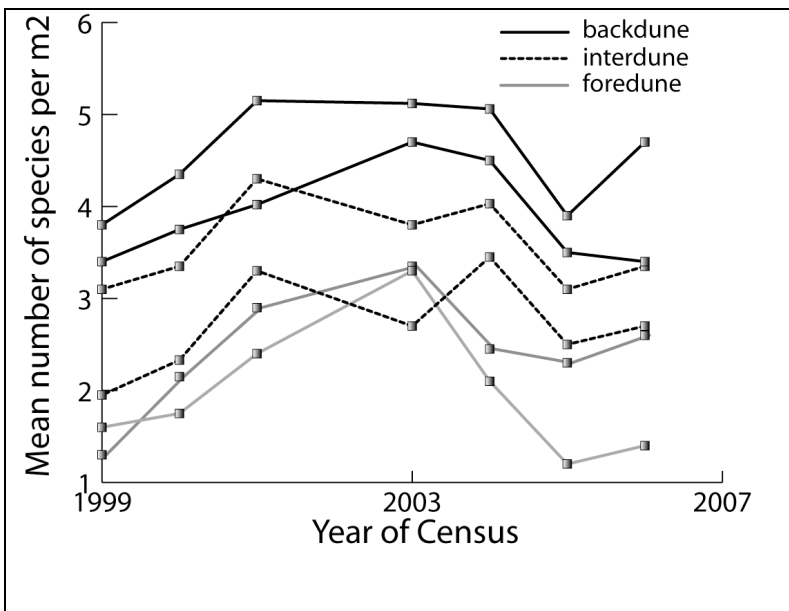


Figure 5. Changes in average species richness per year in each grid from St. George Island.

Species richness shows predictable patterns among the three habitats (Figure 5). Overall, the backdune areas have much higher species richness, with a total of over 40 species found in different years and a higher average per-plot richness. Foredune plots are often completely bare after storms or near the shore and so have a lower average richness, with an intermediate richness found in the interdune plots, which are often dominated by a single species.

Through time, species richness has exhibited a different pattern than that shown by the DCA (Figure 4). Richness gradually increased from 1999 to 2001. However, there was a decline in richness on the interdune plots between 2001 and 2003, possibly due to high surge and overwash in the interdune plots following Hurricanes Helene and Barry. Hurricane Dennis in 2005 was accompanied by an unusually high surge, which appears to have caused a strong decrease in diversity, with some recovery evident in the last census in the fall of 2006.

These storms have very different effects on individual species and habitats. Some species, including relatively common species such as *Heterotheca subaxillaris* and *Oenothera humifusa*, were virtually eradicated from all the plots by the high surge of Hurricane Dennis in 2005 (Figure 2). *Oenothera* showed some recovery in 2006, while *Heterotheca* is still largely absent. Other species showed habitat-specific increases following storms. For example, the grass *Sporobolus virginicus* significantly increased in the overwash interdunal areas and the ground cherry, *Physalis angustifolia*, increased in the backdunes.

Overall, the patterns of vegetation change over time are complex and, as yet, difficult to interpret. There is a clear signature of time (Figure 5), as species composition changes during times of relative calm climates and times of intense storms. However, the data do not suggest a simple pattern of disturbance and recovery, but instead suggest that the vegetation is following a more complicated trajectory.