ERODING COASTLINES

Coastal Impacts of Extreme Storms
Storm-Impact Regimes

**SWASH:** $R_{\text{high}} < D_{\text{low}}$

**OVERWASH:** $R_{\text{high}} > D_{\text{high}}$

**COLLISION:** $D_{\text{low}} < R_{\text{high}} < D_{\text{high}}$

**INUNDATION:** surge + setup $> D_{\text{high}}$
Dune erosion

No Net Change

Net Dune Erosion

Net Onshore Transport Order 100 meters

Net Onshore Transport Order 1,000 meters

IMPACT LEVEL 1
Swash Regime

IMPACT LEVEL 2
Collision Regime

IMPACT LEVEL 3
Overwash Regime

IMPACT LEVEL 4
Inundation Regime

Collison Regime

Overwash Regime

Inundation Regime

Sallenger (2000)
Data from NOAA
Hurricane Research Division

Experimental Advanced Airborne Research Lidar -- EAARL

USGS
Extreme Coastal Change

Dauphin Island, AL
Dauphin Island, AL

August 31, 2005

Gulf of Mexico

Mississippi Sound

Post Katrina

September 2005 (Post Katrina)

Gulf of Mexico

Mississippi Sound

USGS
NASA

Dauphin Island, AL
Dauphin Island, Alabama

Photo credit: National Geographic
Hurricane Lili
Chandeleur Islands, LA
October 2002

IMPACT LEVEL 1
Swash Regime
No Net Change

IMPACT LEVEL 2
Collision Regime
Net Dune Erosion

IMPACT LEVEL 3
Overwash Regime
Net Onshore Transport
Order 100 meters

IMPACT LEVEL 4
Inundation Regime
Net Onshore Transport
Order 1,000 meters

USGS
NASA
LA DNR
Chandeleur Islands, Louisiana

Pre Katrina

Post Katrina

July 17, 2001

August 31, 2005
Extreme coastal change
Nor’Ida:
Outer Banks
North Carolina