

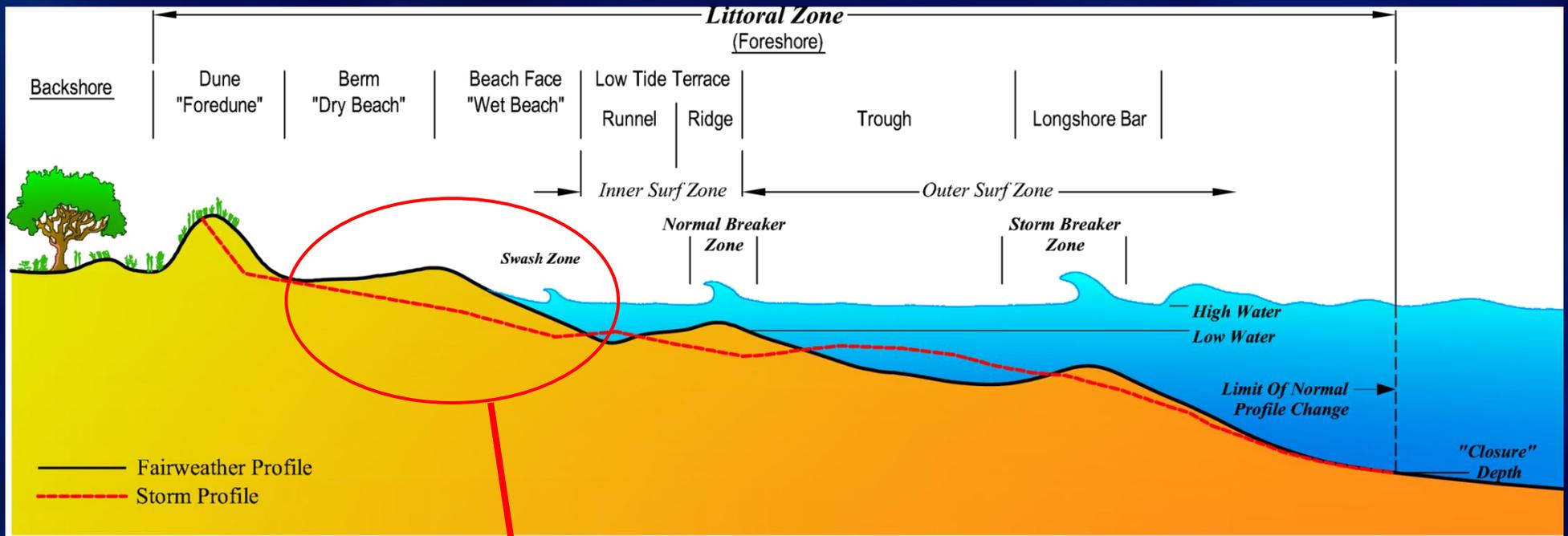
Nags Head Project Monitoring – June 2012



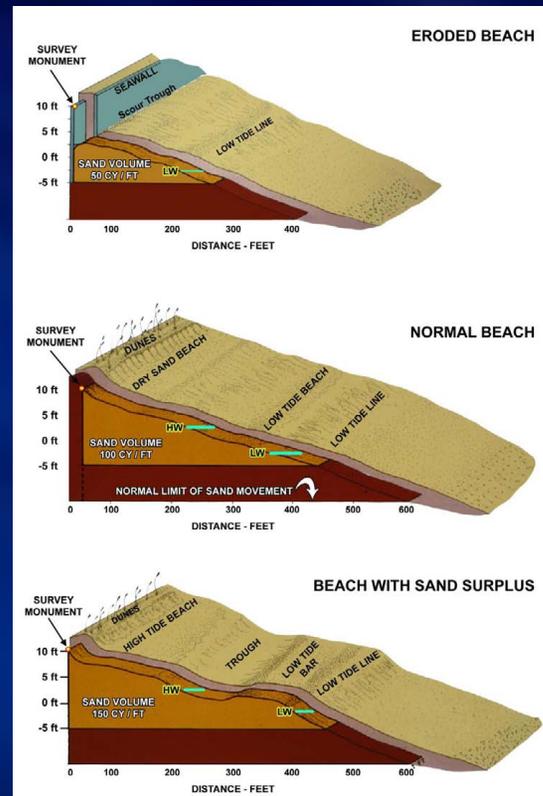
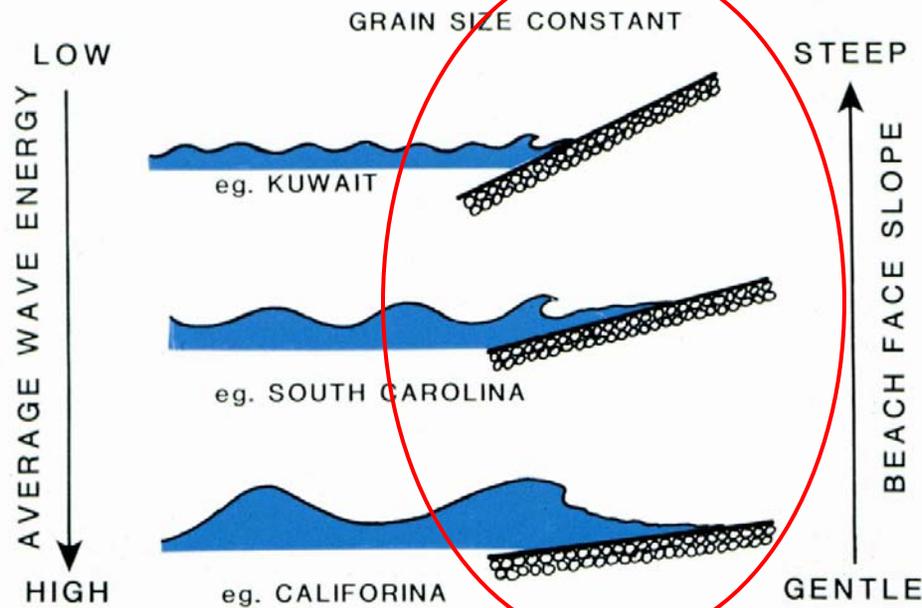
Beach Images Courtesy
Jennette's Pier Webcam



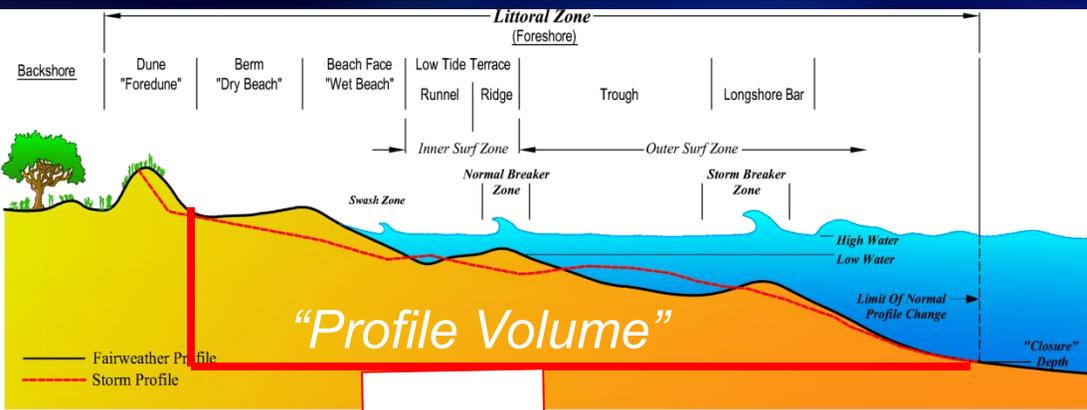
Beach Profile – The Shore Zone That Absorbs Breaking Waves



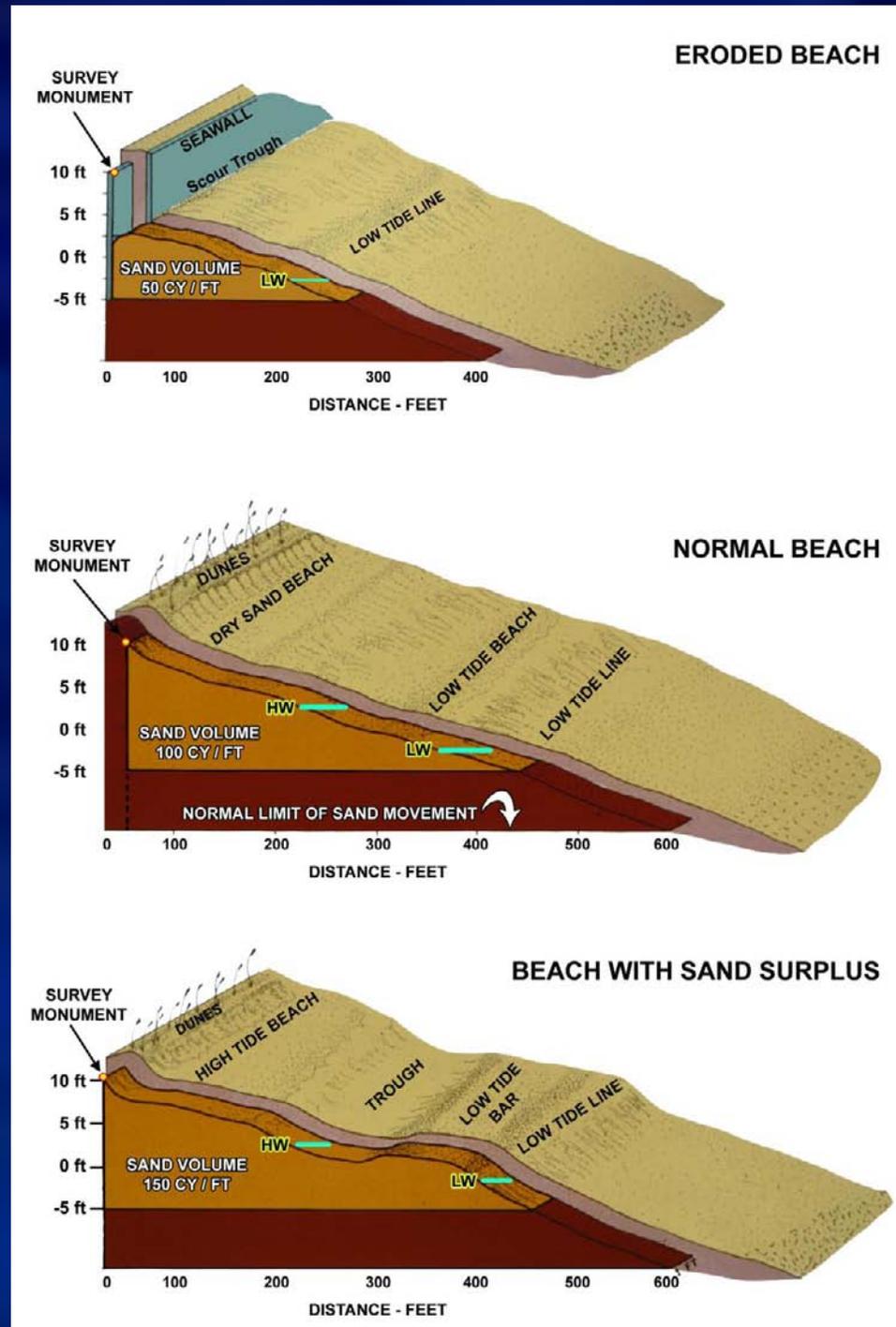
RELATIONSHIP OF WAVE ENERGY, AND BEACH SLOPE



Equilibrium Profiles



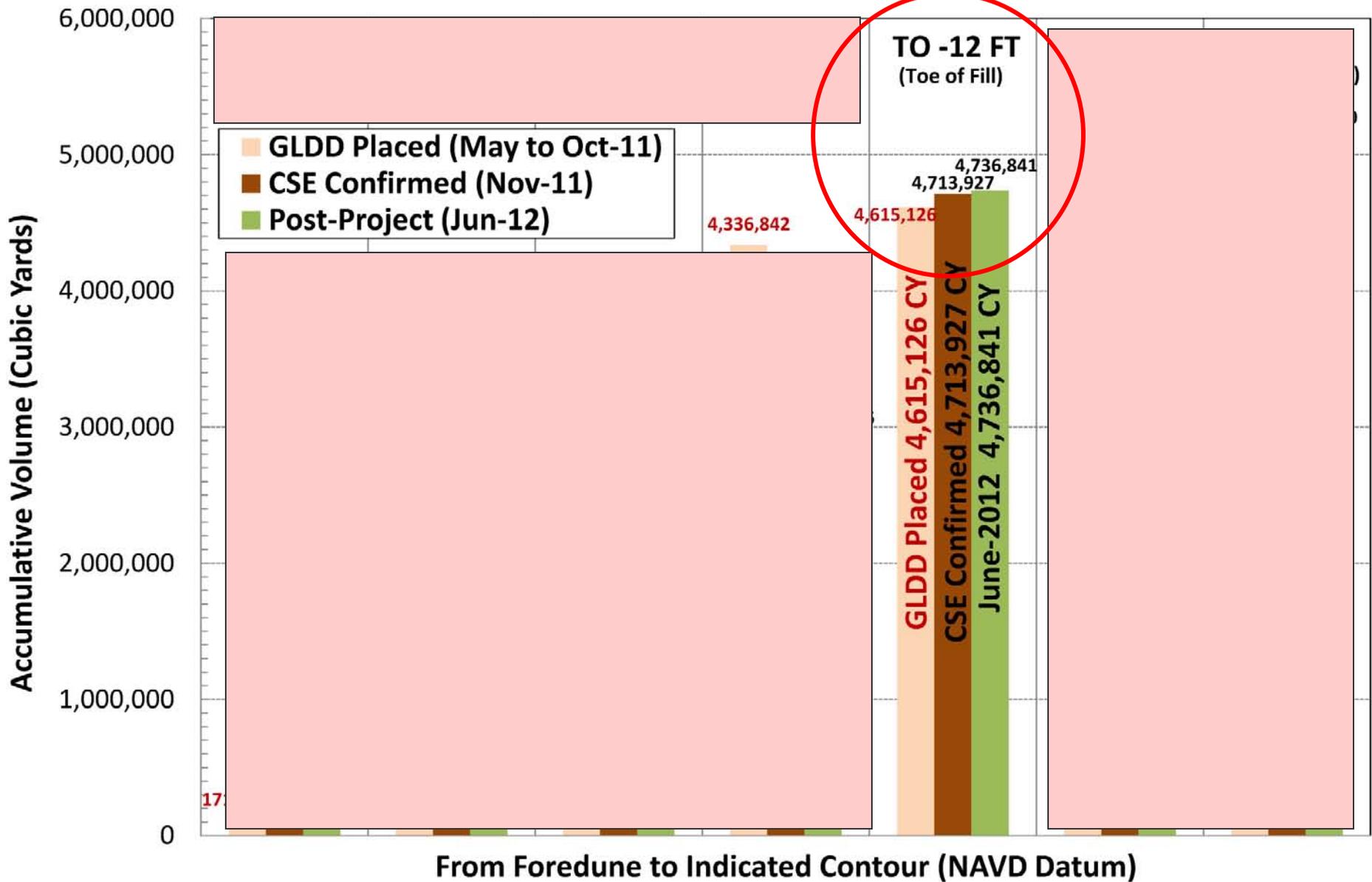
*Profile Shape Will Change Frequently.
But If the Profile Volume Remains
Constant, There Is No Net Loss of Sand*



SUMMARY – CSE’s Memo Dated 19 July 2012

GRAPH A

Nags Head Accumulative Beach Volume Changes (Relative To November 2010 - Pre-Project)



Findings

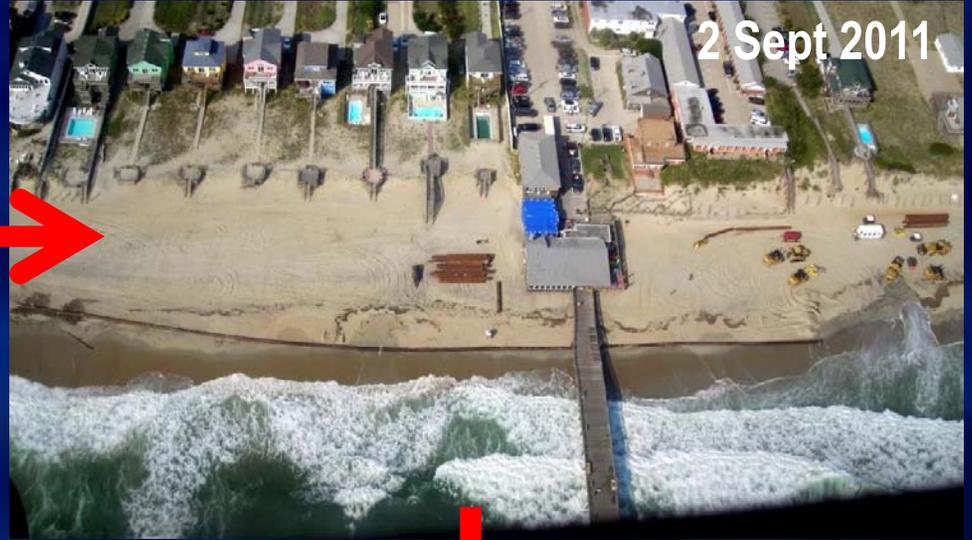
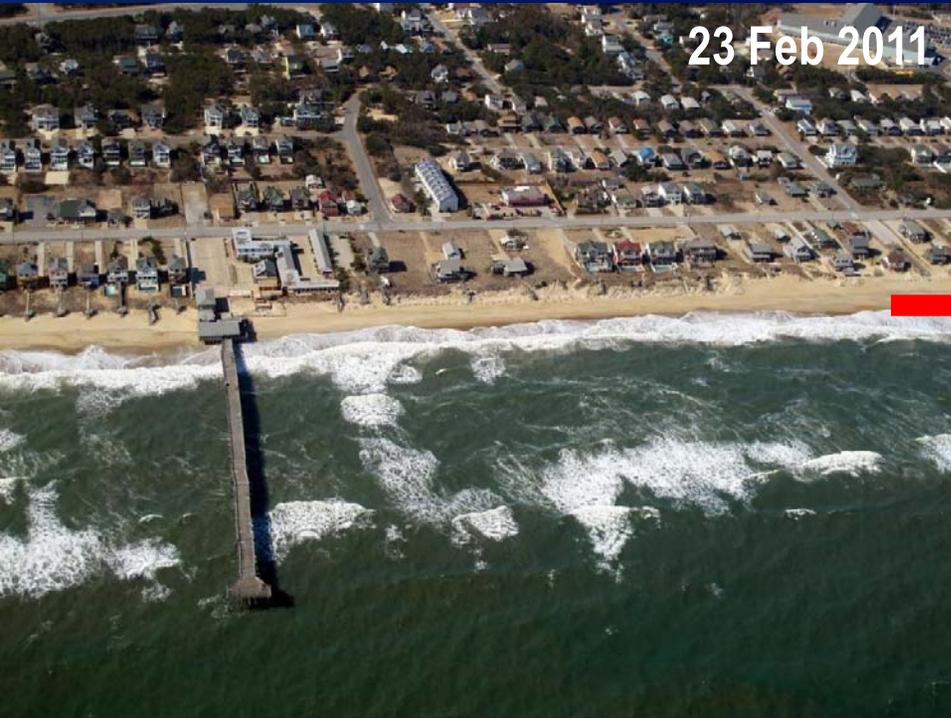
- ▶▶ Nourishment Profiles (cross-sections of the beach and inshore zone) “Equilibrated” Rapidly due to Hurricane IRENE & Fall 2011 Northeasters.
- ▶▶ Profiles Equilibrate In Response to High and Low Waves
- ▶▶ The Depth Limit For Nourishment Equilibration Has Been -12 ft below mean sea level (~800 ft offshore).
- ▶▶ In November 2011, Surveys confirmed ~4.71 million cubic yards* more sand along Nags Head than November 2010
- ▶▶ In June 2012, Surveys confirmed ~4.73 million cubic yards remain in the project area.

“Overall, the project is performing better than expected.”

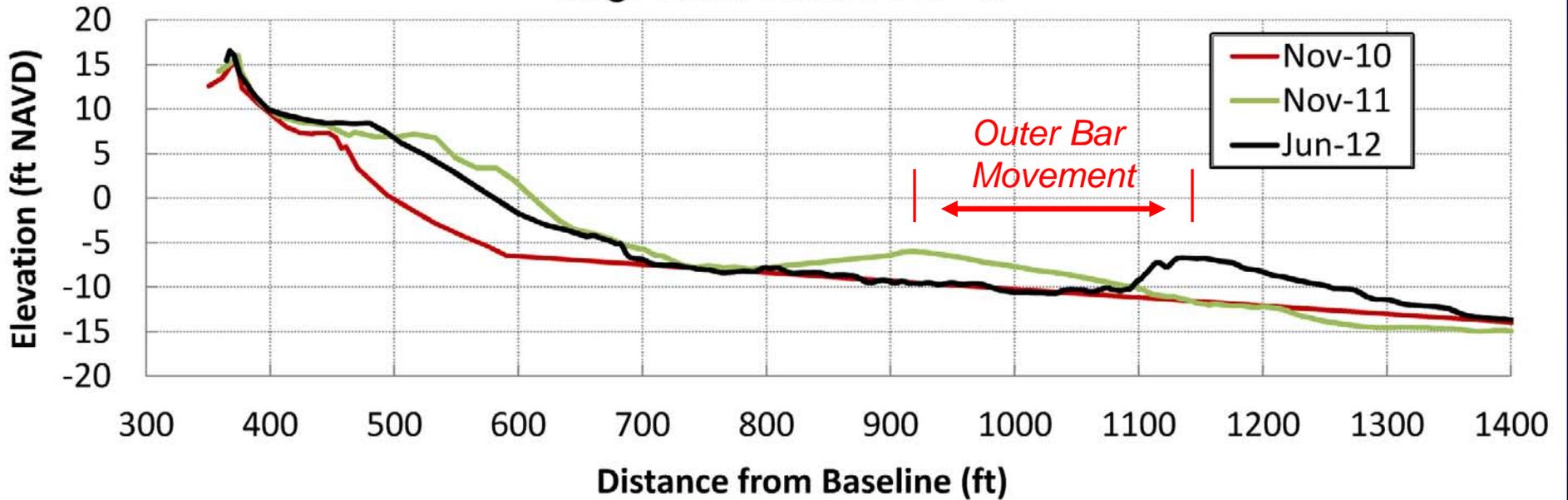
*Nags Head paid for 4.6 million cubic yards



Nags Head Pier – Reach 1



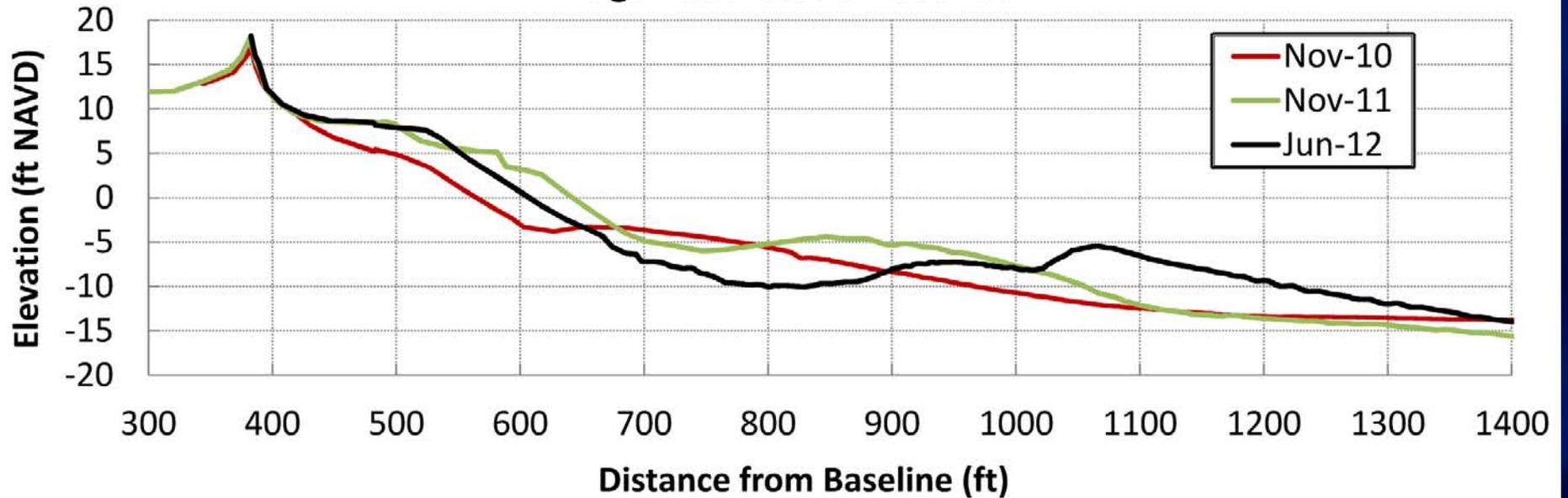
Nags Head Station 525+00



Unit Volume Changes (CY/FT) Relative To Nov-2010

Date of Survey	Toe of Dune To +6 FT	+6 FT To 0 FT	0 FT To -2 FT	-2 FT To -6 FT	-6 FT To -12 FT
Nov-11	6	23	8	16	31
Jun-12	7	16	6	14	29

Nags Head Station 530+00

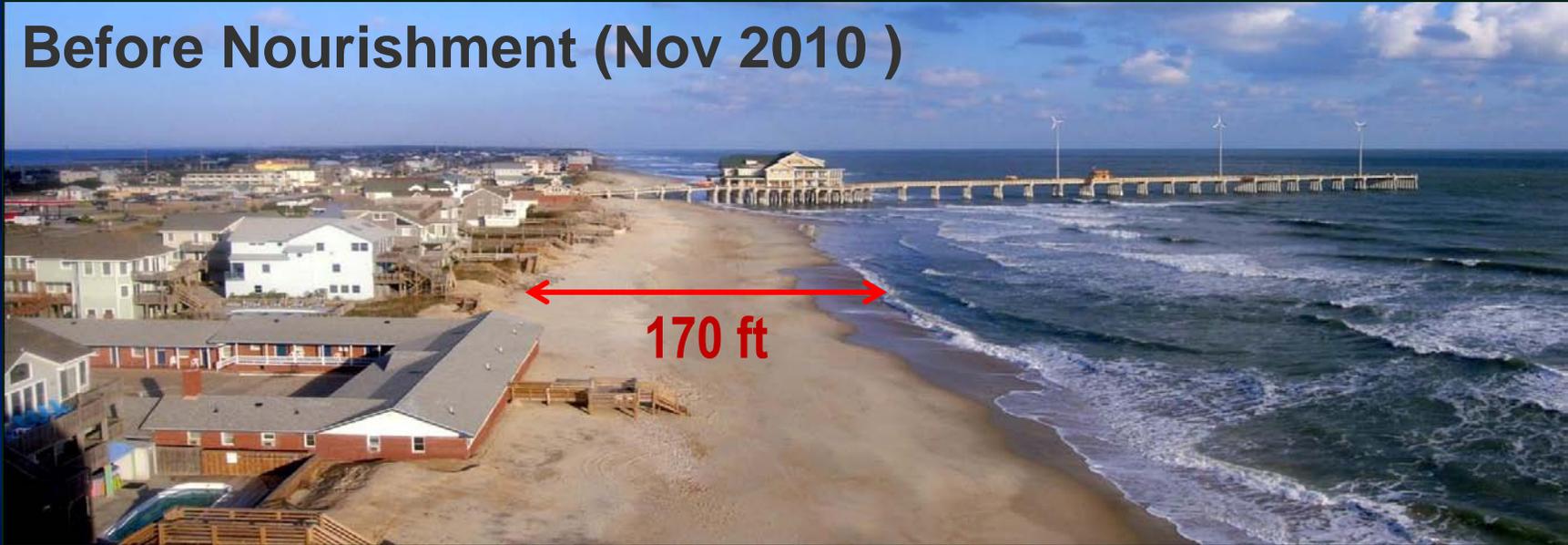


Unit Volume Changes (CY/FT) Relative To Nov-2010

Date of Survey	Toe of Dune To +6 FT	+6 FT To 0 FT	0 FT To -2 FT	-2 FT To -6 FT	-6 FT To -12 FT
Nov-11	6	17	6	5	22
Jun-12	8	11	3	-5	26

On Top of Comfort Inn – Reach 1

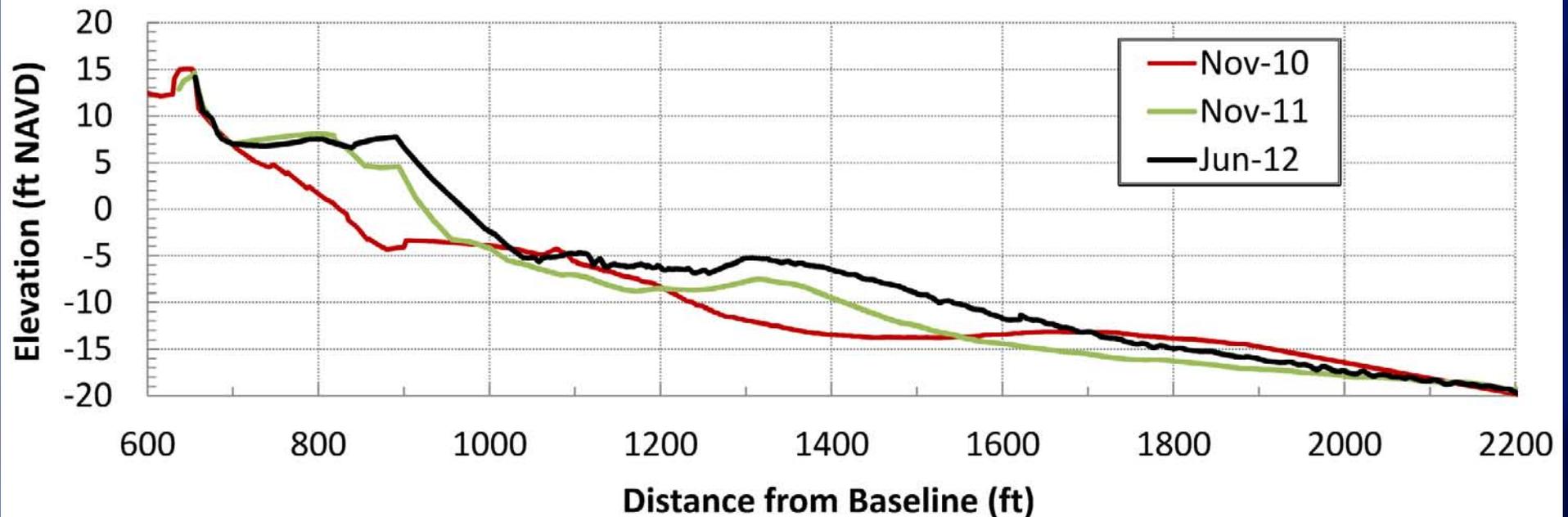
Before Nourishment (Nov 2010)



~10 Months After Nourishment (Jun 2012)



Nags Head Station 785+00



Distance from Toe of Dune to MLW (-2.05 ft NAVD):

Nov-2010 (Before Nourishment) = 170 ft

Nov-2011 (Immediately After Nourishment) = 265 ft

Jun-2012 (First Semi-Annual Survey) = 315 ft