

Modeling of Surviving Prehistoric Landforms on the Florida Atlantic OCS

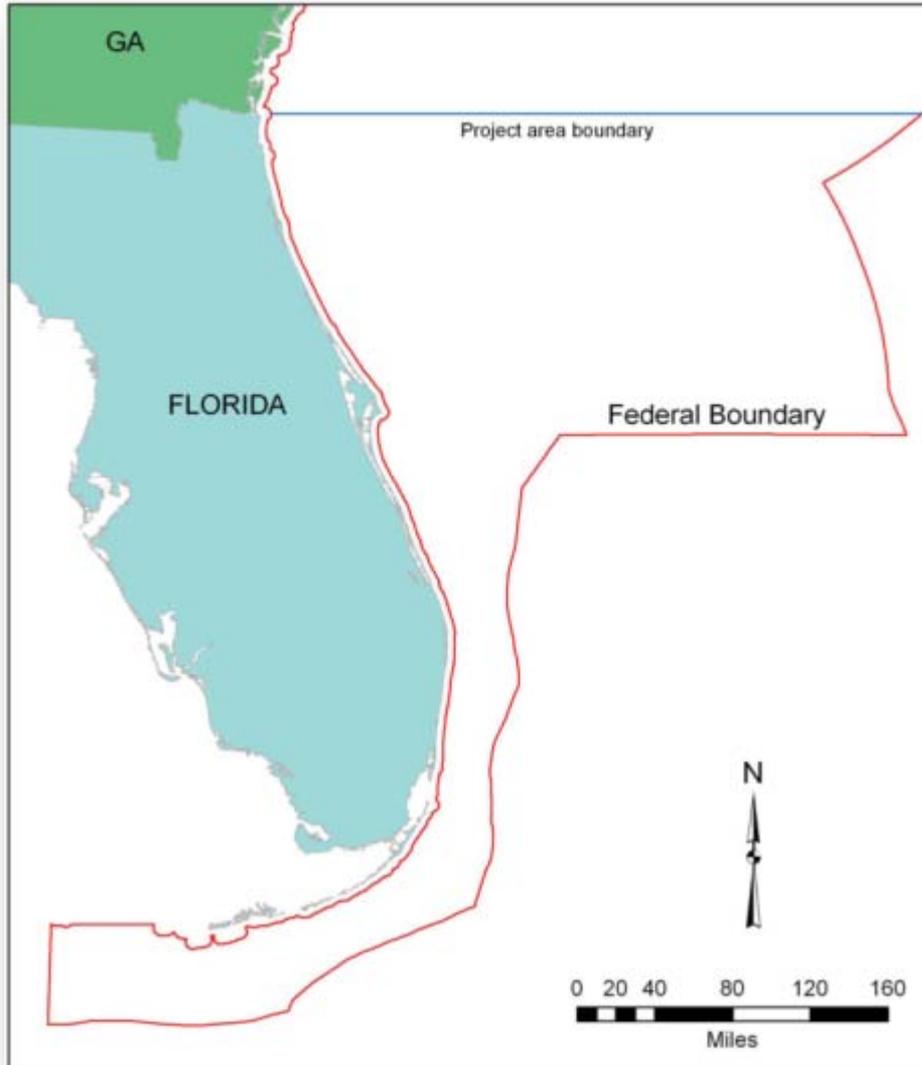


Michael A. Arbuthnot

Southeastern Archaeological Research, Inc. (SEARCH)



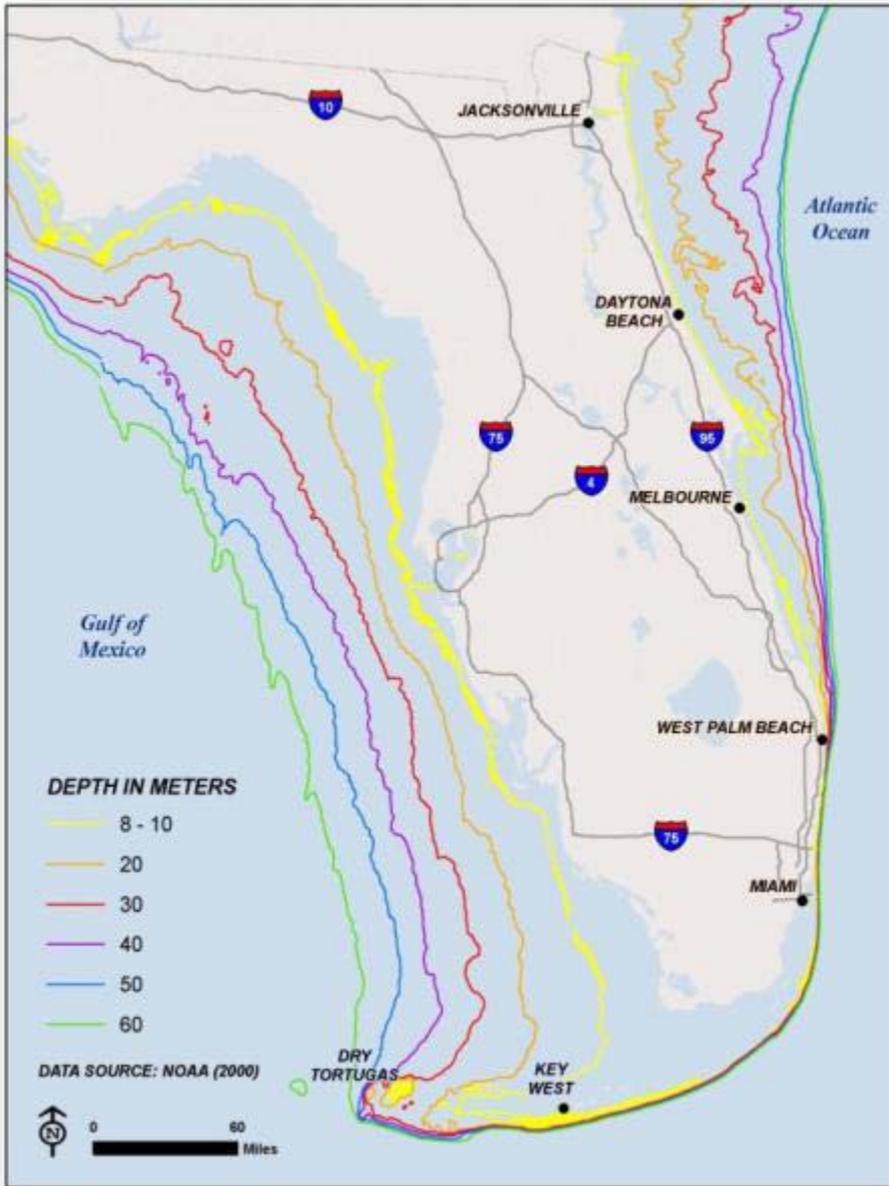
Study Area and Intent



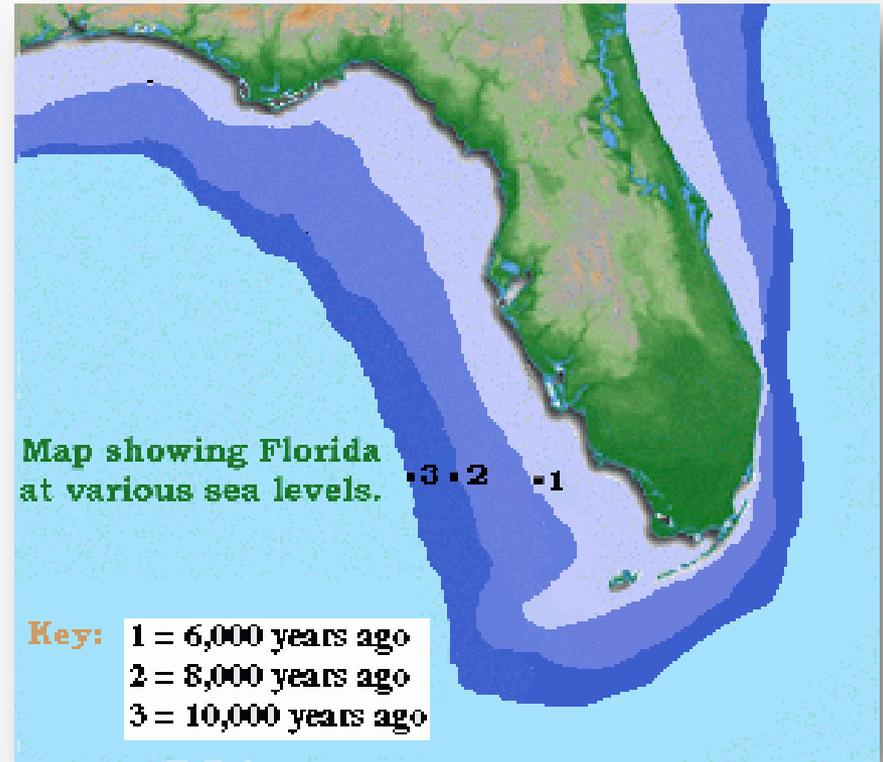
- National Environmental Policy Act of 1969 (83 stat. 853: 42 U.S.C. 4321) Executive Order 11593 of 1971, and the Archaeological and Historic Preservation Act of 1974.
- The National Historic Preservation Act requires federal agencies to protect historic and cultural resources which include shipwrecks, historic fortifications, and coastal settlements, as well as prehistoric sites that have become submerged due to the global and local rise in sea level.

The Florida Platform





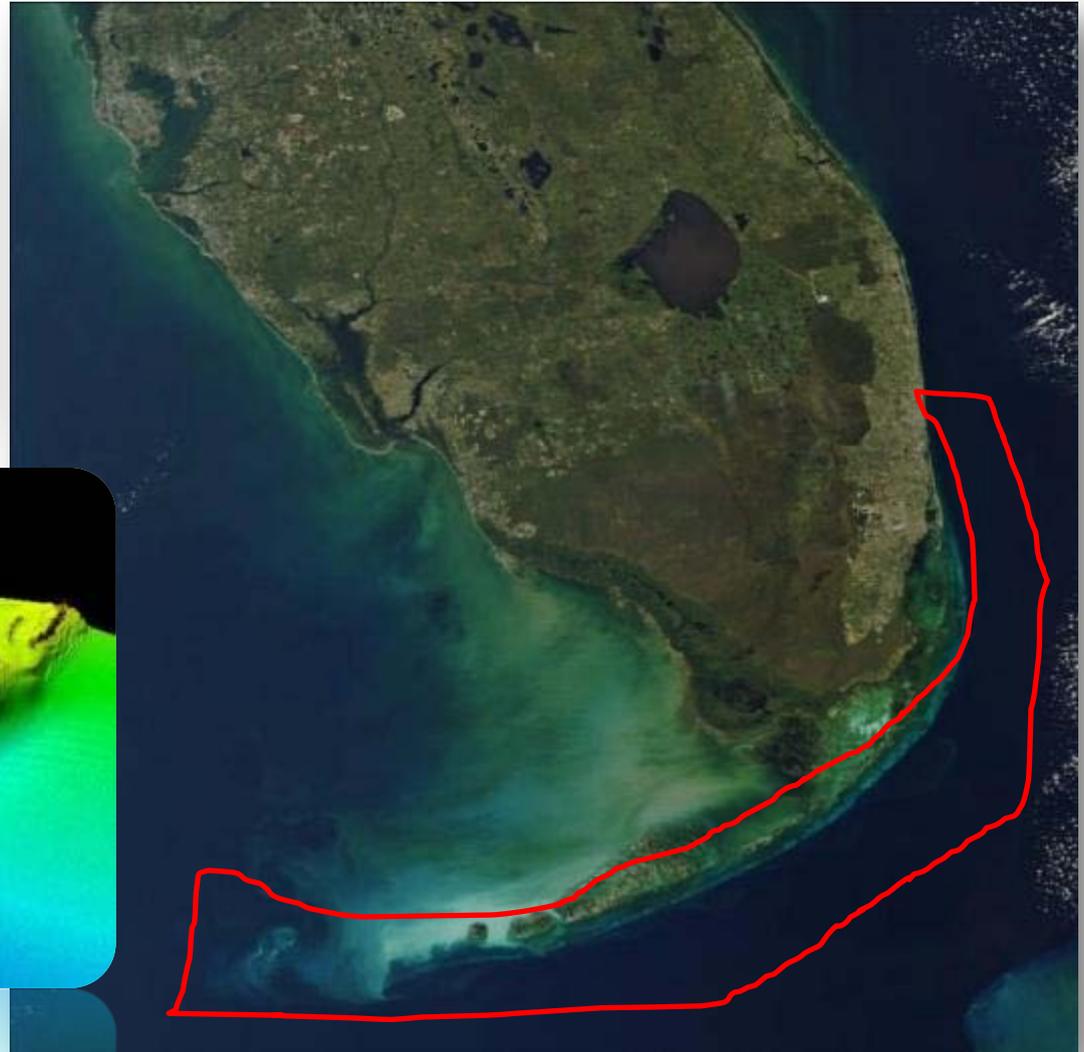
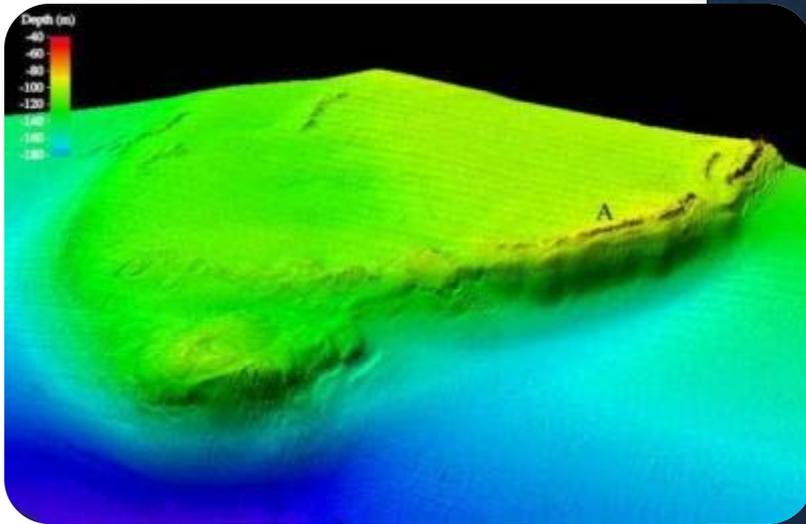
Florida's Continental Shelf



Anastasia Formation



Southern Florida Shelf



Coastal Response to Sea Level Change

Sea Level Curve (adapted from Science Applications, Inc. 1981).

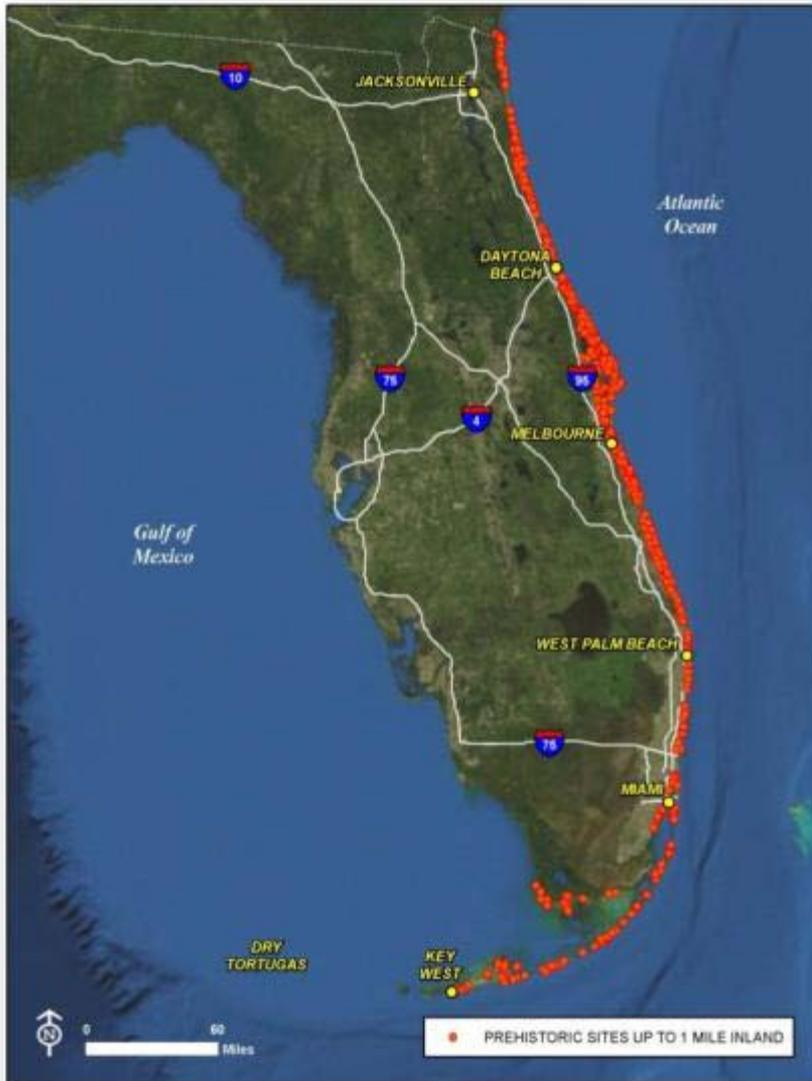
Time Period (BP)	Meters Below Present Sea Level
6,000	10
8,000	12
10,000	23
12,000	35
14,000	44
16,000	56
18,000	57
20,000	44

Duration of Continental Shelf Exposure (adapted from Science Applications, Inc. 1981).

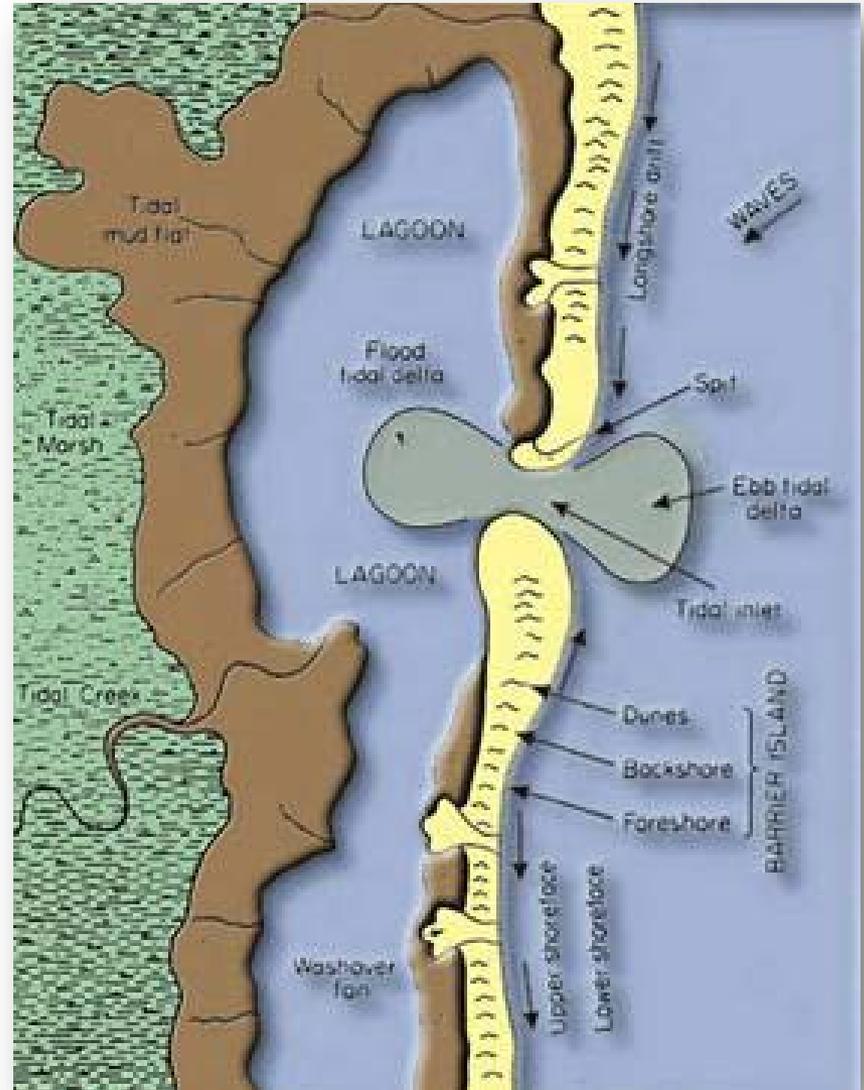
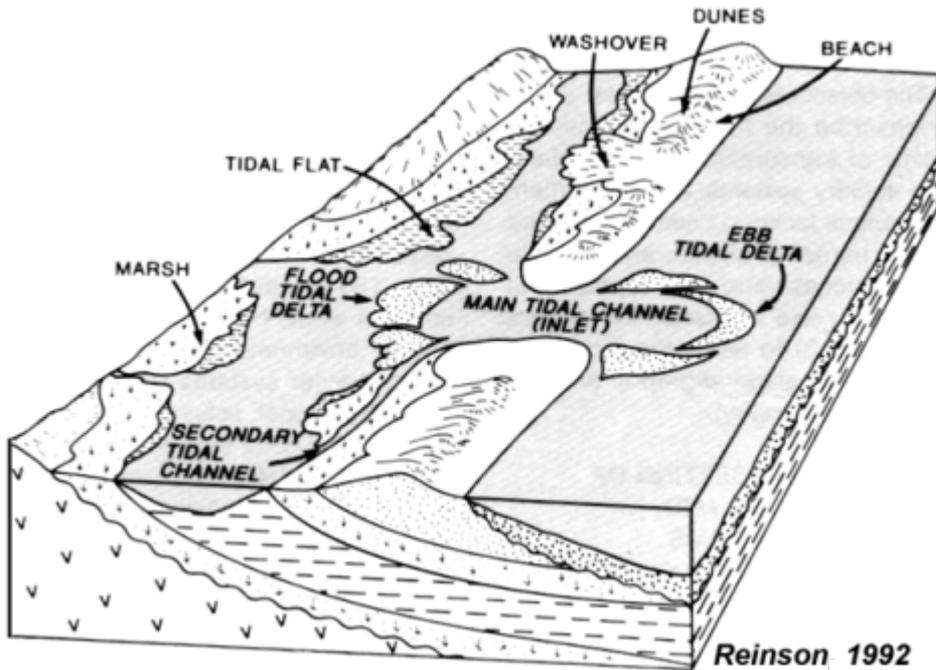
Meters Below Sea Level	Time Interval at or Above Sea Level (Thousands of Years BP)	Duration of Time (Thousands of Years)	Percent of Shelf Exposure (Last 20,000 Years)
10 (32 feet)	6–20	14	70
20 (66 feet)	9.5–20	10.5	52
30 (98 feet)	11–20	9	45
40 (131 feet)	13–20	7	35
50 (164 feet)	14.8–19.3	4.5	22
60 (197 feet)	0	0	0



Prehistoric Settlement Patterns



Geological Considerations of Sea Level Rise



Submerged Prehistoric Resources Sensitivity Areas

Zone 1 (**red**) — The High Potential Sensitivity Zone:

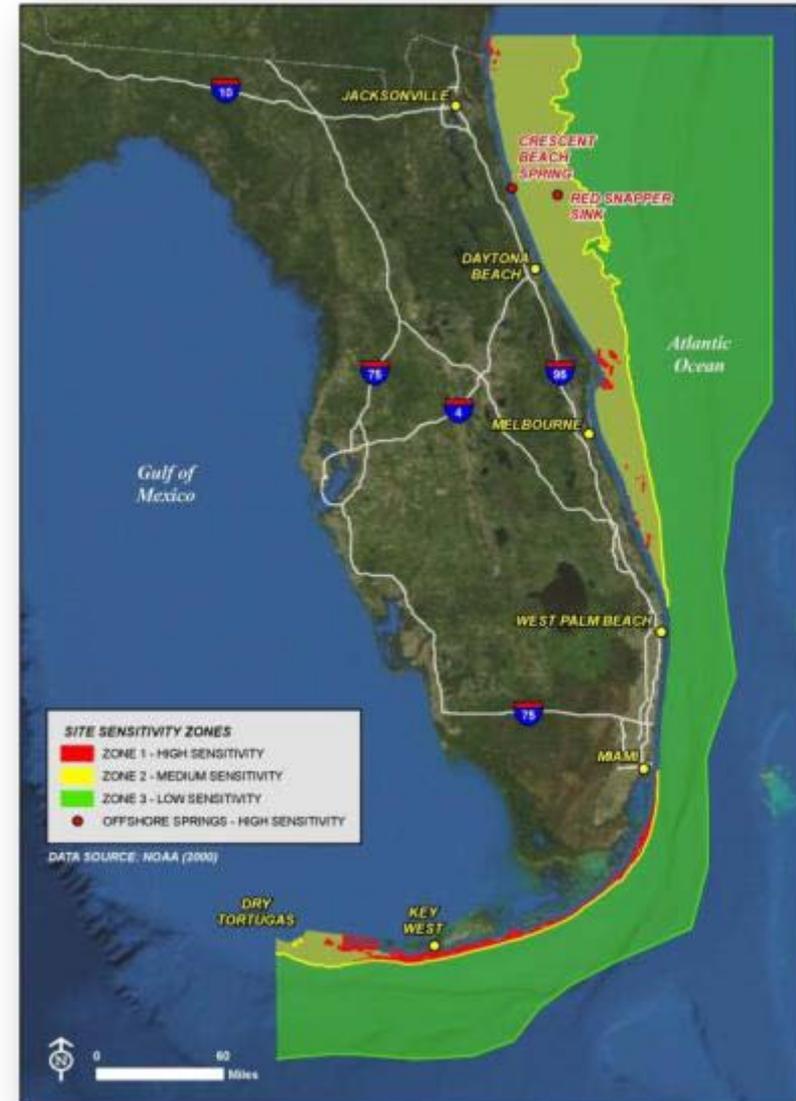
- Exposed at 8,000 B.P.
- Potential for Early to Middle Archaic deposits
- Depths of 10 m and less
- Includes areas around Crescent Beach Spring and Red Snapper Sink

Zone 2 (**yellow**) — The Medium Potential Sensitivity Zone:

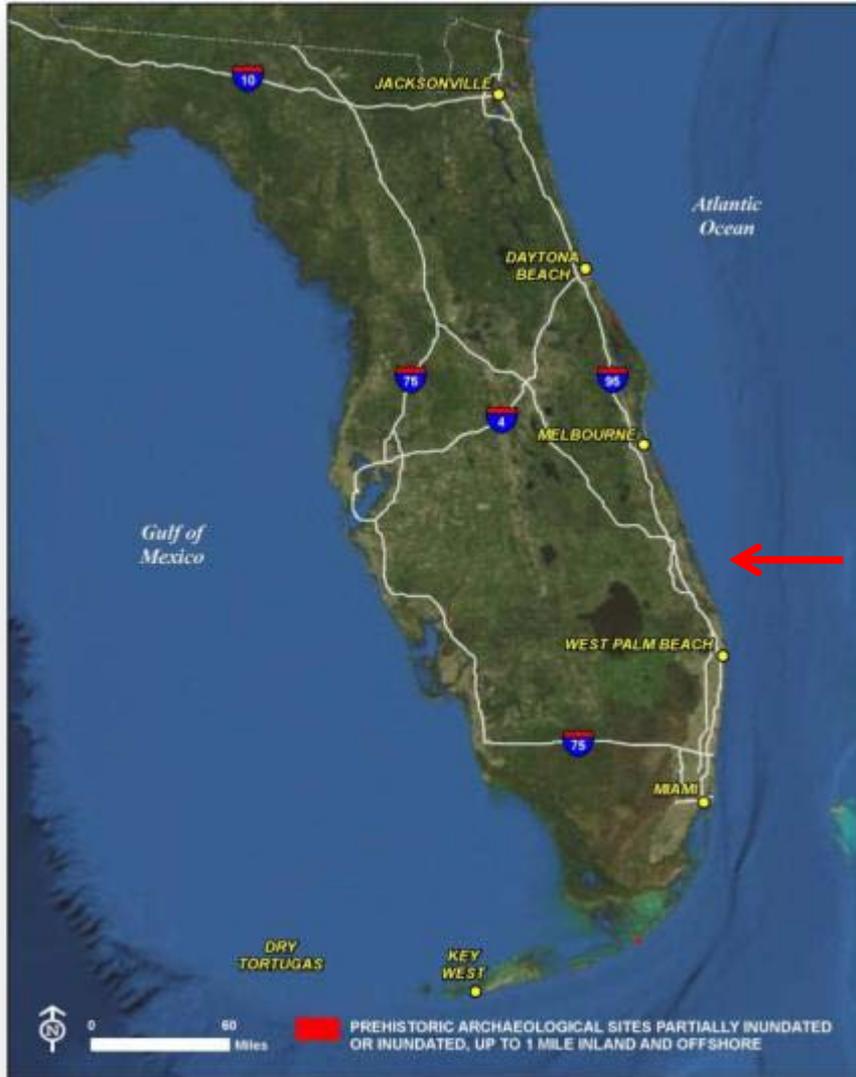
- Exposed between the 8,000–12,000 B.P.
- Potential for Pleistocene and Early Holocene deposits
- Depths of 10 – 40 m
- Sites like Windover Pond (7,400 B.P.) might exist offshore

Zone 3 (**green**) — The Low Potential Sensitivity Zone:

- Exposed from the 12,000 B.P. to the 16,000 B.P.
- Pre-Paleoindian potential
- Depths of 40 m or greater
- Shed light on location and timing of early migration routes



The Douglas Beach Site (8SL17)



BAR Catalog 09.306.70582.01 from site 8SL17
Unfluted Clovis Point



Prepared by Louis D. Tesar 09/15/2009
with flatbed scanner and Photoshop 7.0

Recommendations

- Prior to future work along Florida's Atlantic Continental Shelf, the sensitivity model should be reviewed
- If proposed work requires impacting the ocean's base within the high or medium sensitivity zones, it is recommended that a maritime archaeologist assess the area through coring or a means most suited to the recovery of cultural resources, should they exist
- The intensity of the testing should increase within areas that exhibit the greatest potential for containing intact deposits, which include locations
 - around submerged springs
 - of comparatively higher elevation
 - with intact peat deposits
 - where gray-green clay has been identified



References

Environmental Systems Research Institute (ESRI). 2009. ArcGIS Desktop: Release 9. Redlands, CA: Environmental Systems Research Institute.

Reinson, G.E.1992. Transgressive barrier-island and estuarine systems. In: Walker, R.G. and N.P. James, eds. Facies Models: Response to Sea Level Change. Geological Association of Canada. Pp. 179–194.

Science Applications, Inc. (SAI). 1981. A cultural resource survey of the Continental Shelf from Cape Hatteras to Key West. Vol. I & II. Bureau of Land Management, New Orleans, LA.