Surveying Archaeological Sites Damaged by Hurricane Sandy along the Coastlines of Southern Rhode Island

Narragansett, South Kingstown, Charlestown, Westerly

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RIGIS and NEURISA Catastrophe Planning

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Cultural Resource Management Consulting Firm (CRM)

- Archaeological surveys
- Historic architectural surveys
- Cemetery investigations
- Industrial history
- National Register nominations
- Artifact analysis & curation
- Educational outreach
- Interpretive exhibits





Implementing Legislation

- Section 106 of National Historic Preservation Act Effects on National Register-listed or eligible historic properties
- Section 220 of RI's Coastal Management Resource Council Areas of historic or archaeological significance
- Rhode Island Cemeteries Act (RIGL 23-18-11)
- Requests from towns via responses to state or tribal preservation offices

Hurricane Sandy October 29, 2012



Hurricane Sandy aftermath Block Island: Corn Neck Road and Spring Street emergency repairs









Crescent Beach Site (RI 2555) Archaeological Recovery



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RI Historical Preservation & Heritage Commission State Historic Preservation Office





Project timeline

Dates	Task	Description
Ongoing	Consultation/coordination	 - RI Historic Preservation & Heritage Commission - RI Coastal Resources Management Council - Narragansett Indian Tribal Historic Preservation Office - Affected property owners
Winter 2014	Archaeological sensitivity assessment	Develop predictive model for presence of archaeological sites.
Spring 2014	Phase I fieldwork: Reconnaissance Survey	Locate and identify archaeological sites impacted and exposed by hurricane.
(Summer 2014)	Phase II fieldwork: Intensive archaeological testing	Perform archaeological testing at identified sites.
(Fall 2014)	Artifact analysis, cataloging, curation	Return artifacts to lab for cleaning, identification, cataloging, and spatial analysis.
(Spring 2015)	Technical report & maps	Summarize results of Phase I Reconnaissance Survey and Phase II Intensive archaeological testing, interpret artifacts and features, assess integrity of sites, nominate eligible sites for listing in National Register, make management recommendations for damaged sites.
(Spring 2015)	GIS deliverables	Prepare datasets representing PAL's Phase I Reconnaissance Survey and Phase II Intensive archaeological testing.

Narragansett Indian Tribal Historic Preservation Office Tribal Historic Preservation Office



...from the Bay of the same Name, to Pawcatuck River, now the Boundary between the Governments of Rhode Island and Connecticut.

- John Mason c. 1636







Native American Occupation of the Coastal Zone The coastal zone is an area of extreme resource availability and diversity



Archaeological sensitivity using predictive modeling

The environmental and cultural conditions associated with areas of known archaeological sites are used as factors to predict areas with unknown archaeological resources.

BAILEYVILLE

Unknown areas are "sensitized" (high, moderate, and low) based on the likelihood of finding intact archaeological sites.



Desktop and field technologies

Surveying Archaeological Sites Damaged by Hurricane Sandy

GIS staff ArcMap 10.2: mapping, analysis

Project archaeologists

 ArcGIS Explorer: intuitive application for non-technical staff to visualize any existing datasets, create new datasets, share geodata with GIS staff or colleagues, ability to drag/drop geotagged field photographs into map

Field archaeologists

- Trimble GPS: submeter data collection, custom data dictionaries for standardized attribute collection, map view showing project datasets with real-time location
- Geo-enabled cameras

Desktop assessment by project staff using ArcGIS Explorer



Desktop data creation by project staff using ArcGIS Explorer



Shoreline change assessment using aerial imagery



Shoreline change assessment using 2011 LiDAR Surveying Archaeological Sites Damaged by Hurricane Sandy



Overview of datasets used for desktop archaeological assessment



Phase I Reconnaissance Survey: documenting existing conditions



Phase I Reconnaissance Survey: identifying Hurricane-Damaged-Archaeological-Deposits(HDADs) Surveying Archaeological Sites Damaged by Hurricane Sandy



Phase I Reconnaissance Survey: inventory of Native American HDADs



Phase I Reconnaissance Survey: Inventory of historic HDAD Fort Mansfield at Napatree Point



Phase I Reconnaissance Survey: inventory of historic HDAD Fort Mansfield at Napatree Point



Thoughts on the technology

Surveying Archaeological Sites Damaged by Hurricane Sandy

Successes... attribute

- Availability of pre- and post-Sandy datasets invaluable, esp LiDAR and aerials
- Easy and informal access for non-technical staff to GIS data and tools
- Non-technical staff able to produce and share geodatasets
- Ability to quickly share field data (GPS/geotagged photos) with staff and client

Concerns...

- GIS spatial analysis tools not used for archaeological sensitivity heads-up digitized
- Reduces consistency of results, between multiple project areas and multiple staff
- Restricts 'repeatability' of predictive model

In summary...

- Professional staff able to easily incorporate intuitive archaeological knowledge not easily represented by discreet datasets
- Desktop sensitivity model proved successful: high correlation between sensitized areas and locations and density of identified archaeological sites

Future directions

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