Using GIS to Document Cultural Resources After a Natural Disaster

Cultural Resource GIS Facility
National Park Service
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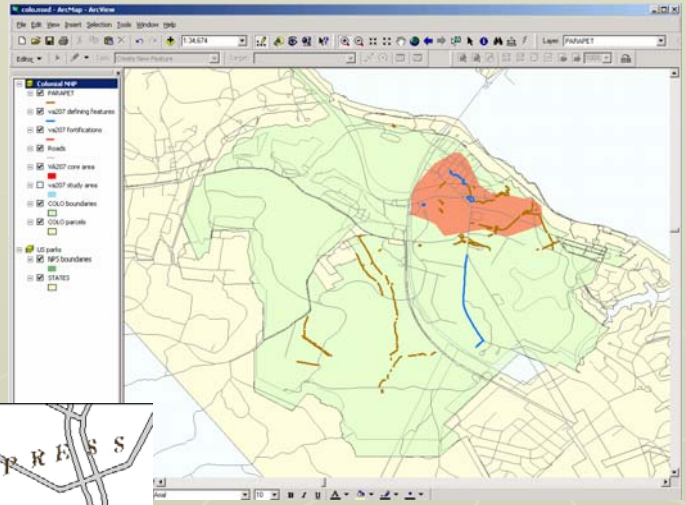
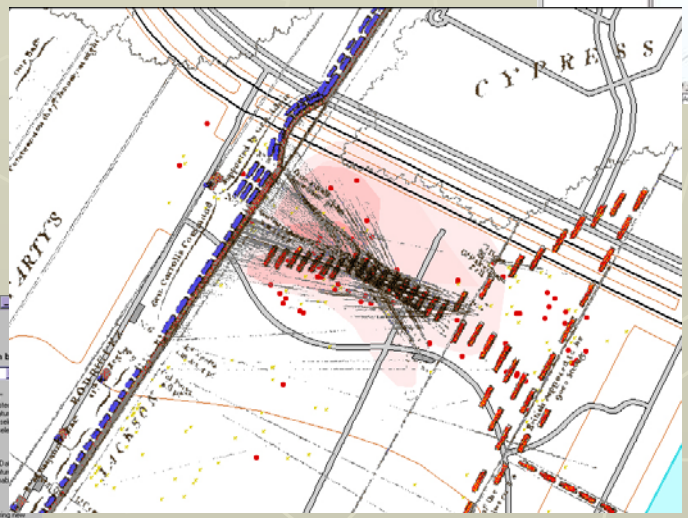
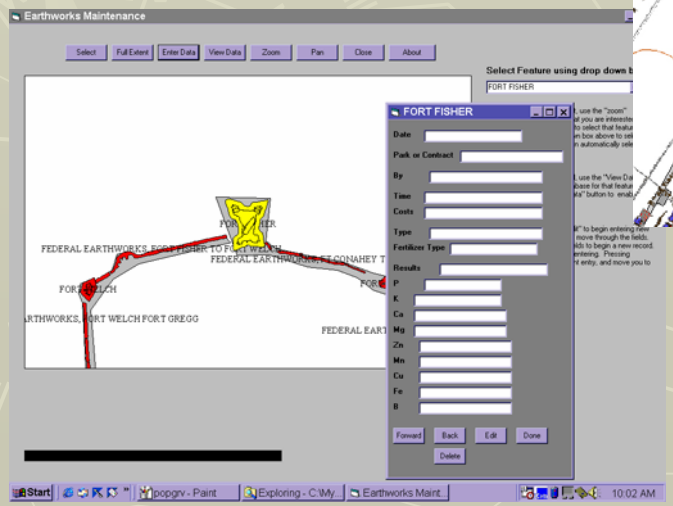
The Cultural Resource GIS Facility
National Park Service

- Geographic Information Systems (GIS)
- Global Positioning Systems (GPS) Survey
- GIS Analysis
- Cartography and Output
- GIS Programming
- GIS and GPS Training





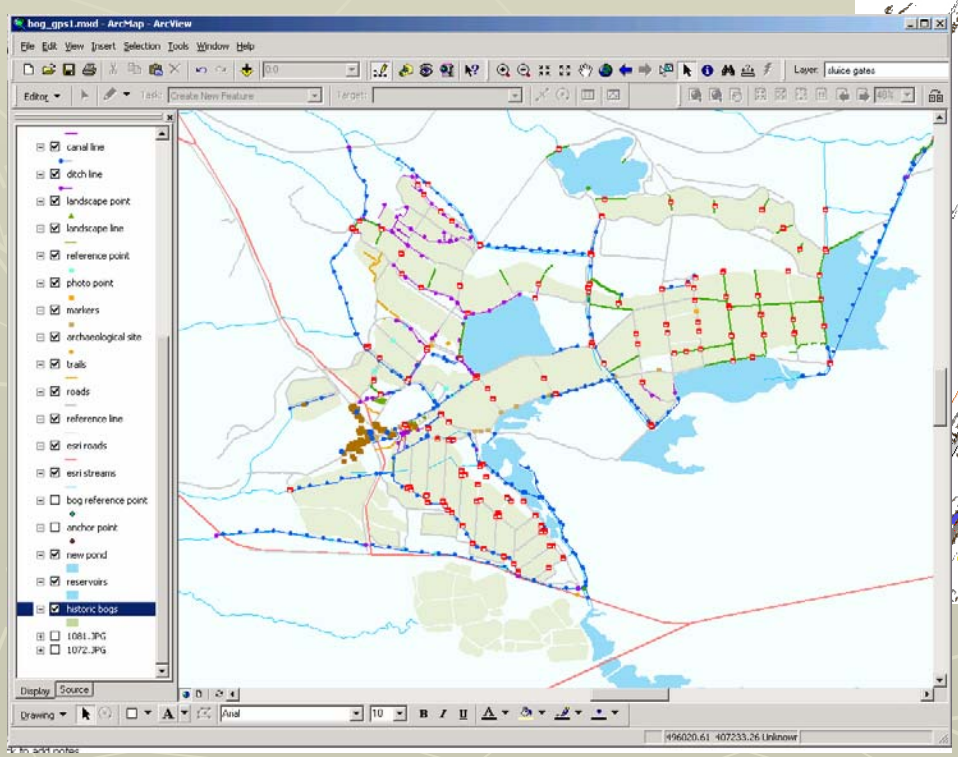


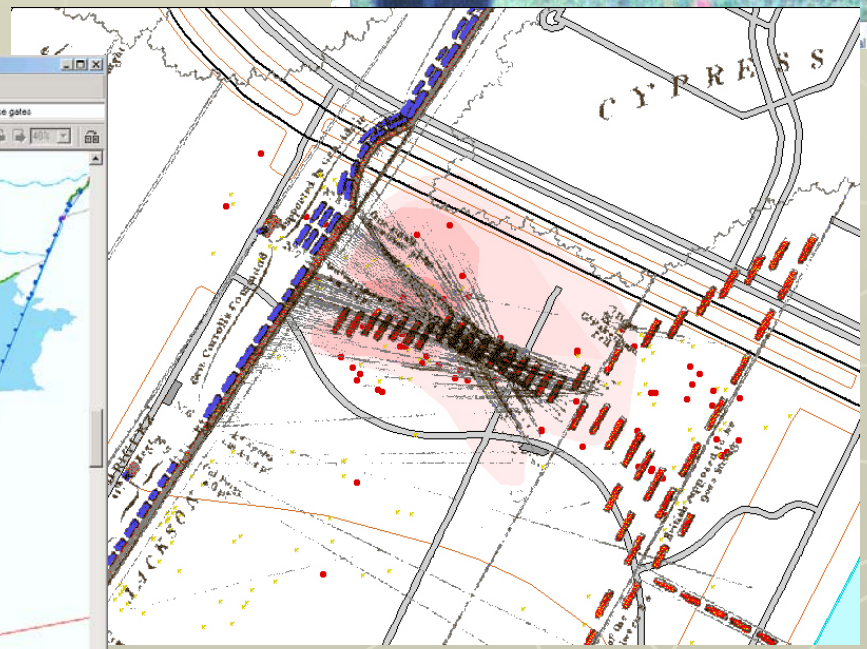
CRGIS frequently works with the American Battlefield Protection Program, and other NPS programs or divisions.

Our primary mission is to assist State Historic Preservation Offices and National Park Units in automating data, collecting data, and exploring the use of technology with cultural resource management.

Technologies as Tools

- GIS and GPS are powerful tools, which can help preservationists in their traditional methods
- Our basic processes remain the same, including fieldwork and analysis of our findings
- These tools enable us to improve our accuracy, enhance the measured drawings and photographs we already produce, link information together and look at our data in new ways, providing critical contextual information





Scope of the Katrina Project

- The Katrina/Rita disaster is the single largest disaster for cultural resources that the US has witnessed since the creation of the National Historic Preservation Act in 1966
- Among other things, the National Historic Preservation Act created the National Register of Historic Places, our nation's catalog of important cultural resources
- It also stipulates that any Federal undertaking which may adversely affect National Register eligible cultural resources be mitigated
- For FEMA, the Katrina/Rita event is the largest Section 106 project ever

Section 106 Requirements

- In order to be compliant with Section 106, FEMA must survey and evaluate all of the potential demolitions (funded by FEMA) for their historic significance, consult with the State Historic Preservation Office to develop concurrence, and determine what will mitigate any adverse affects to historic resources
- To do this, FEMA needs accurate locational information for potential undertakings to understand the extent of the problem
- FEMA needs an accurate evaluation of the historic significance and nature of the resources, including current photographs
- In order to place any potentially eligible resources into context, FEMA must also have an understanding of the historic significance of the area to understand the interaction of various cultural resources and their relative significance

Scope of the problem in New Orleans:

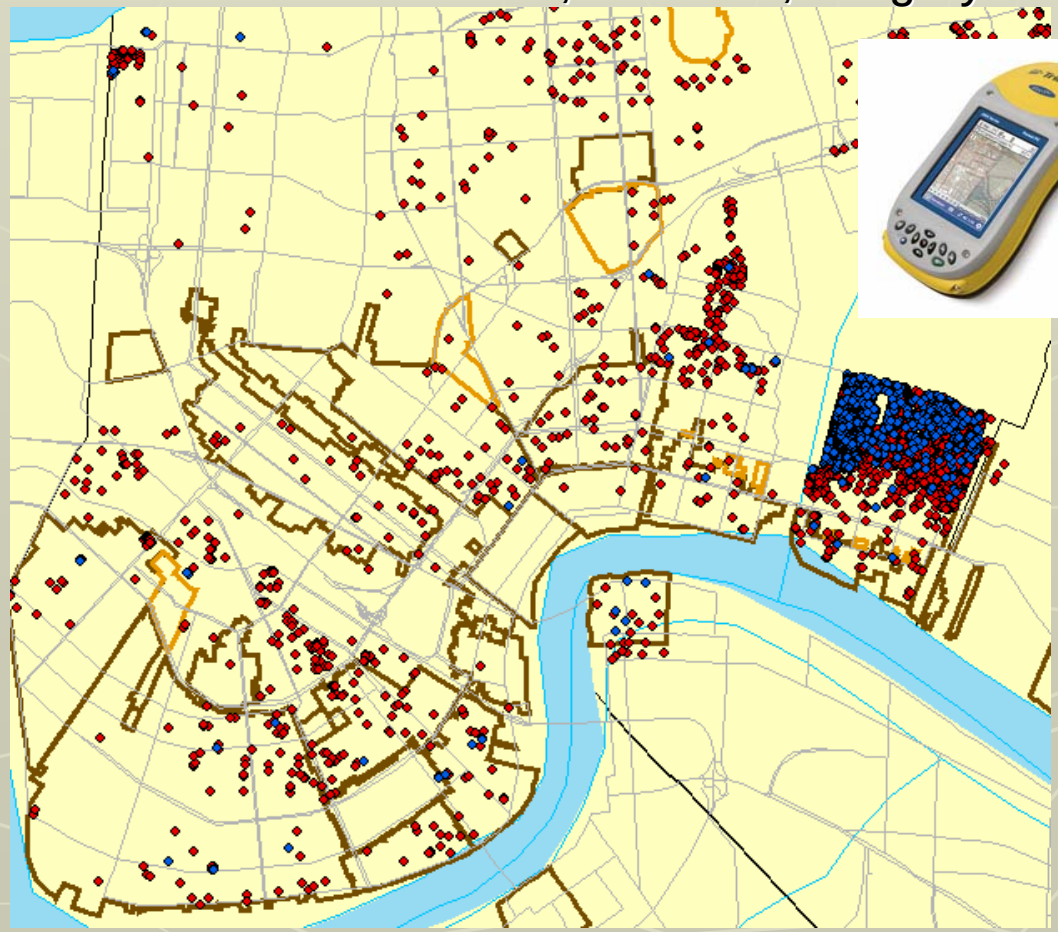
5000 red-tagged structures (eminent threat)

86,000 yellow-tagged structures (major damage)

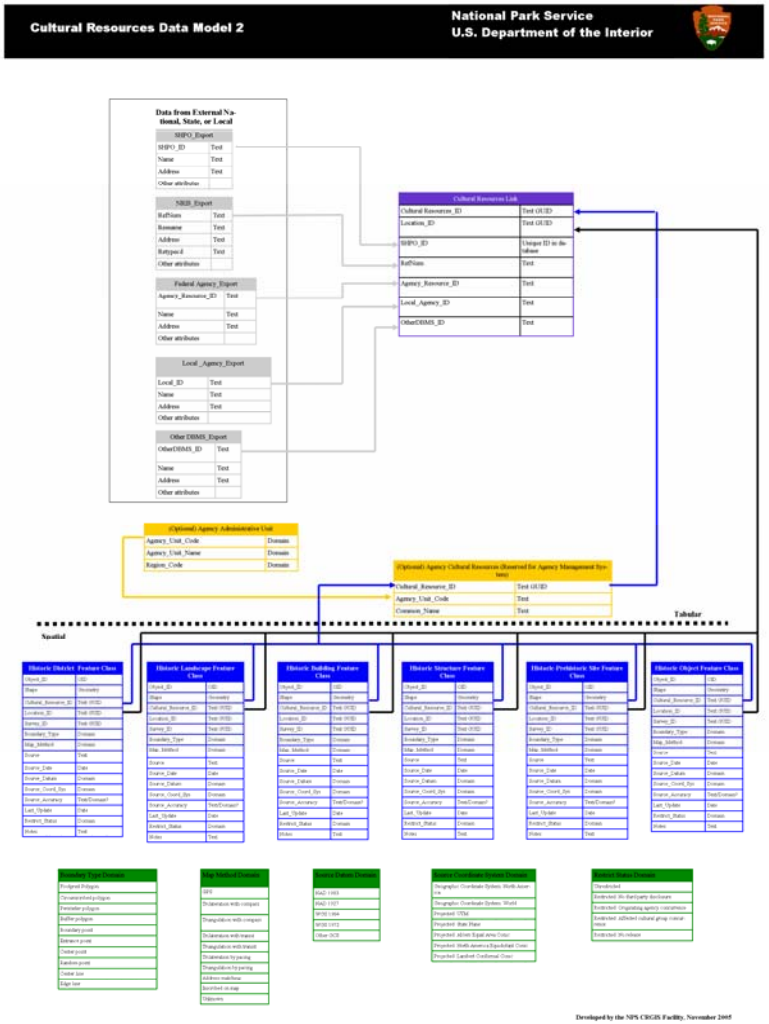
40,000 green-tagged structures (habitable)

Survey and Evaluation

- FEMA requested the National Park Service, Cultural Resource GIS Facility, develop a strategy for identifying and evaluating all of the affected properties for their National Register eligibility in Orleans Parish, and the surrounding Parishes
- The NPS developed a GPS survey strategy for the properties slated for demolition by the City of New Orleans using Trimble XM hand-held receivers with a detailed data dictionary to document the historic characteristics, condition, integrity and eligibility of each structure
- This accurate survey produces a form of documentation, as required by Section 106
- Documentation usually takes the form of drawings and photographs, however structures that are destroyed can not be drawn
- FEMA now has GPS documentation, and a GIS view of the area, showing how these resources relate



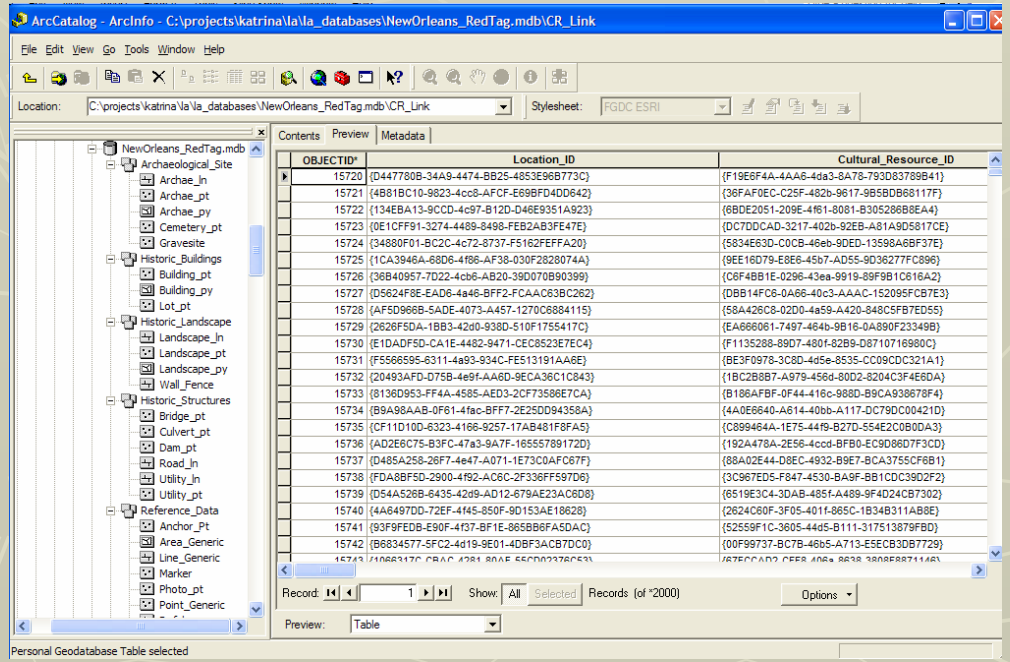
Integration of the Data with FEMA and Local Partners



- Part of the NPS strategy included creating a GeoDatabase for the resources
- GPS data from the survey of red-tagged buildings is already incorporated
- GPS data from subsequent demolition requests will be incorporated
- GPS data from the 25,000 properties that have been determined potentially eligible for the National Register in New Orleans will be incorporated as a mitigation
- GPS data from the surrounding Parishes will be incorporated as demolition continues
- The GeoDatabase then becomes part of the FEMA dataset for the disaster as a whole
- The GeoDatabase becomes a form of mitigation itself, and is shared with the State Historic Preservation Office, other Federal Agencies and the City

Opportunity to Field Test Draft Standards

- Under OMB Circular A-16 the National Park Service was designated the lead agency for the development of cultural resource spatial data standards for all Federal agencies
- The Cultural Resource GIS Facility is responsible for making these standards, now in draft form
- The GeoDatabase created for the Katrina disaster followed a data model that implemented these draft standards, allowing the NPS to field test the model
- The model creates feature classes with feature data sets for each cultural resource type
- Each cultural resource is assigned a globally unique ID
- Each unique representation of the location of that resource is assigned a globally unique ID
- A link table associates the cultural resource ID with each of its locational IDs, and allows links from each resource to external databases, such as those created by other Federal, state or local partners

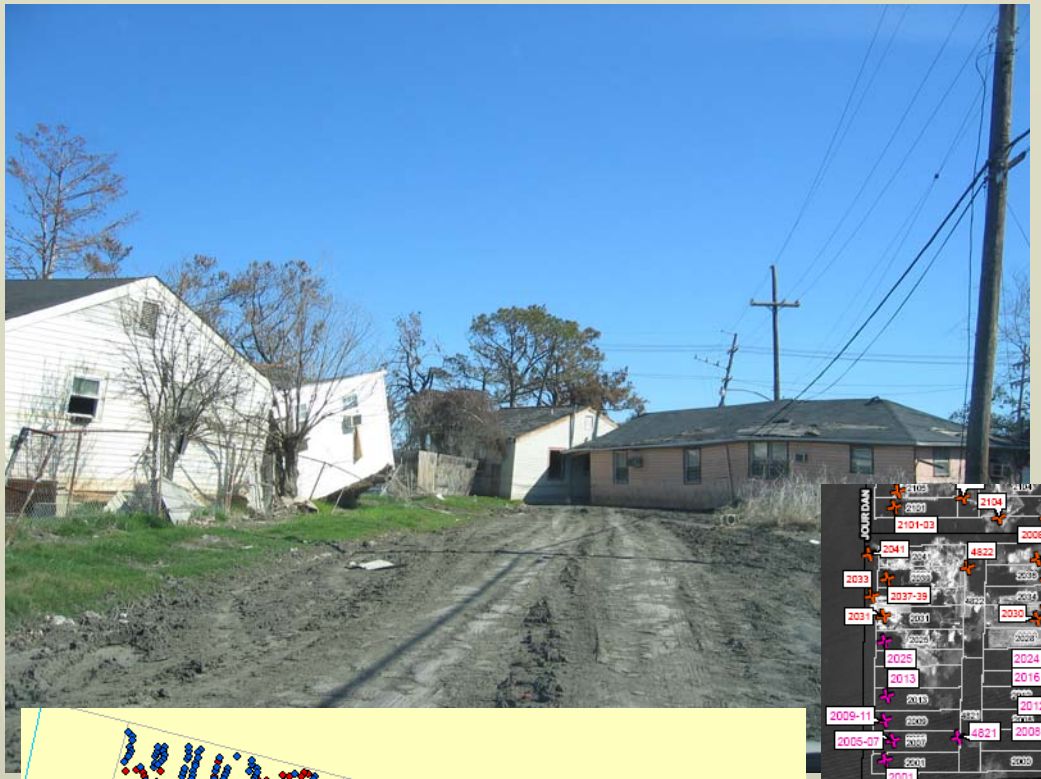


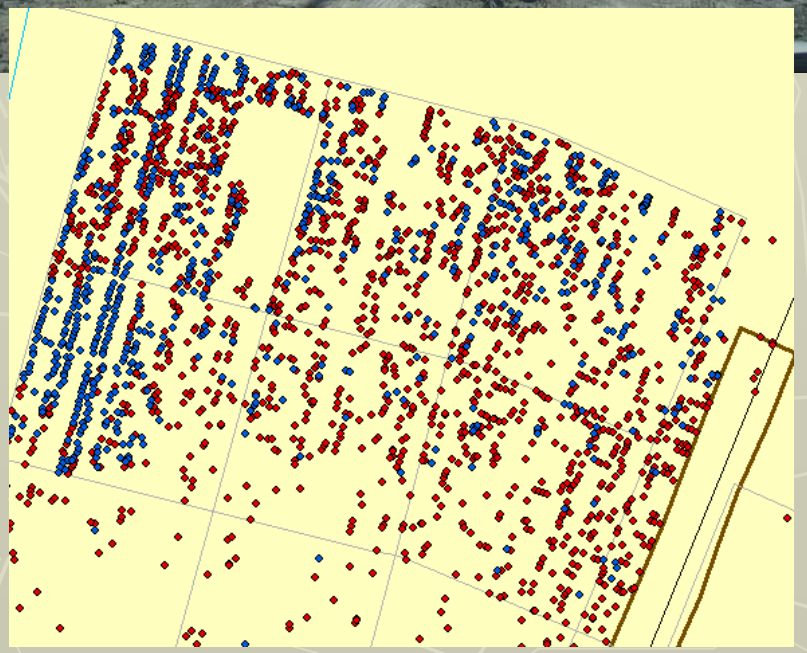
Survey Challenges

- Implementing a completely new form of survey and evaluation of cultural resources to comply with Federal regulations during a disaster is a difficult task
- The need to complete the process with speed is critical, however the need to accomplish the task efficiently within Federal, state and local bureaucracy becomes significantly more difficult
- Without equipment, trained staff and consistent management, this task becomes extremely challenging

Survey Challenges

- Survey work itself in a disaster environment poses significant challenges





Assessing the Strategy

- The survey of structures scheduled for demolition, and therefore requiring assessment by FEMA for Section 106, is now complete
- The successful survey strategy and GeoDatabase implementation of the draft standards has allowed the Federal and state partners to quickly and digitally form concurrence on National Register eligible properties, through GIS
- The successful implementation of the data model based on the draft standards has been incorporated into a programmatic agreement formed between FEMA and the state, calling for the provision of direct links between the FEMA data, the SHPO GIS and the City of New Orleans GIS.
- The GPS documentation of cultural resources, GIS data produced, and the method of reviewing each site for Section 106 purposes is digital for the first time, and now serves as a mitigation or treatment measure for the first time

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