

Something About GPR at the Kirkland Family Cemetery: A Lesson in How to Do GPR in a Very Public Place!



FLORIDA PUBLIC
ARCHAEOLOGY
NETWORK

Richard W. Estabrook, Ph.D.
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What We'll Cover Today...

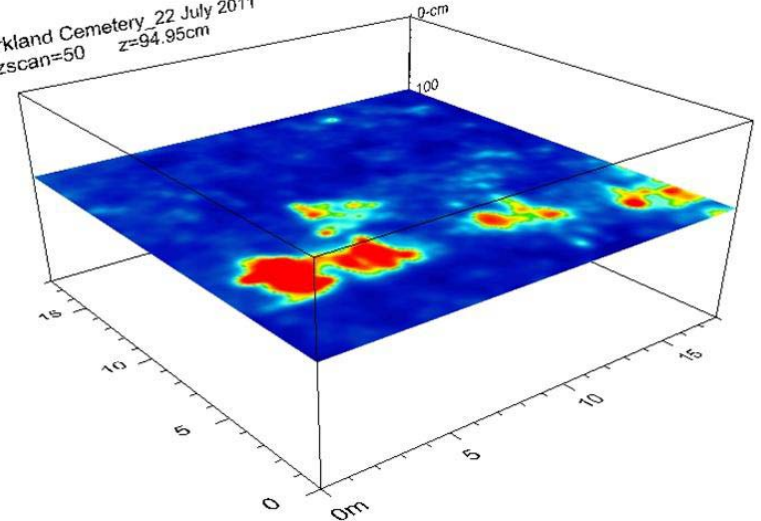
Kirkland Family Cemetery

Public Outreach and GPR



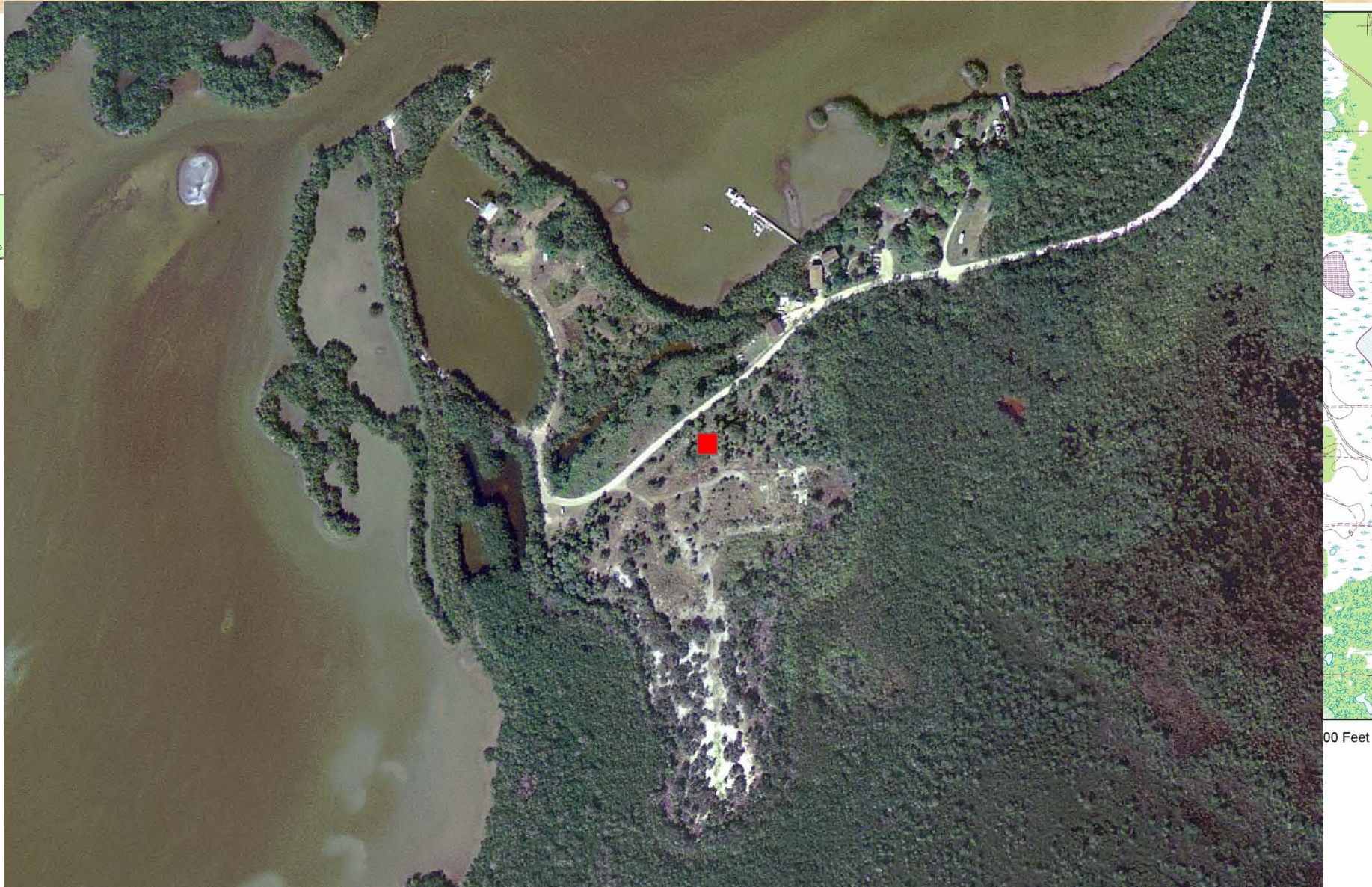
Data Analysis / Results

Kirkland Cemetery 22 July 2011
zscan=50 z=94.95cm



How GPR Works (just the basics!)

Kirkland Family Cemetery



00 Feet

Kirkland Family Cemetery



What Makes GPR Work?



Data computer

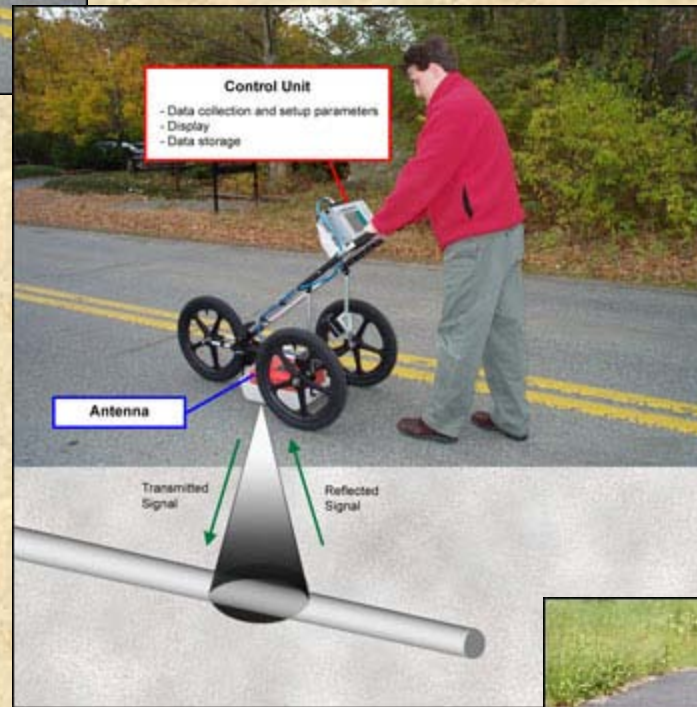
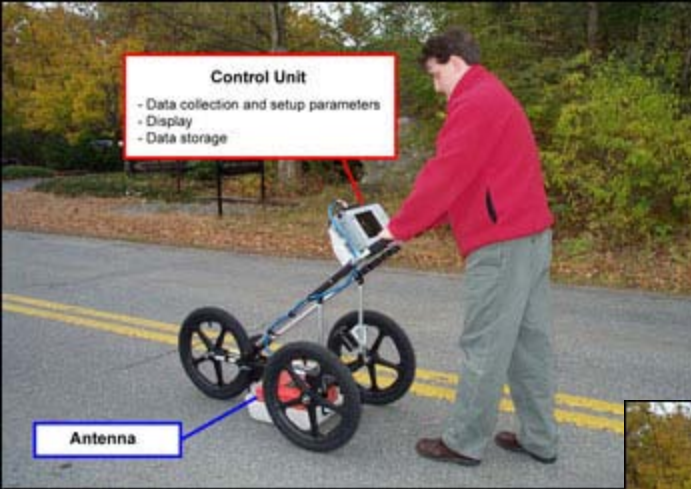


400 MHz Antenna



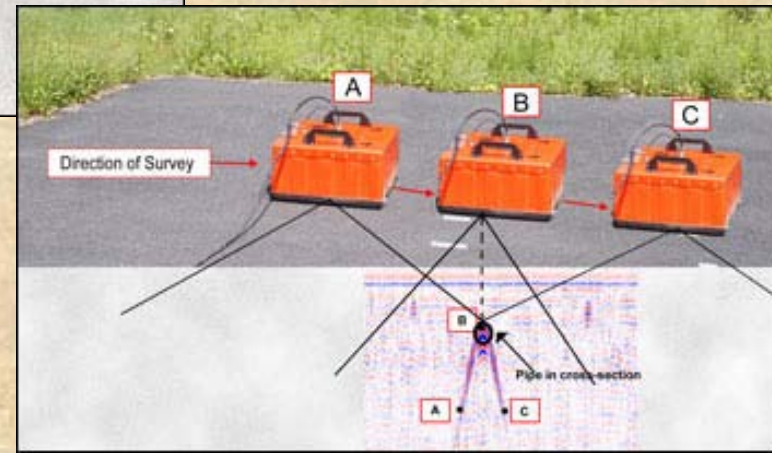
Distance calibration wheel

How Does GPR Work?



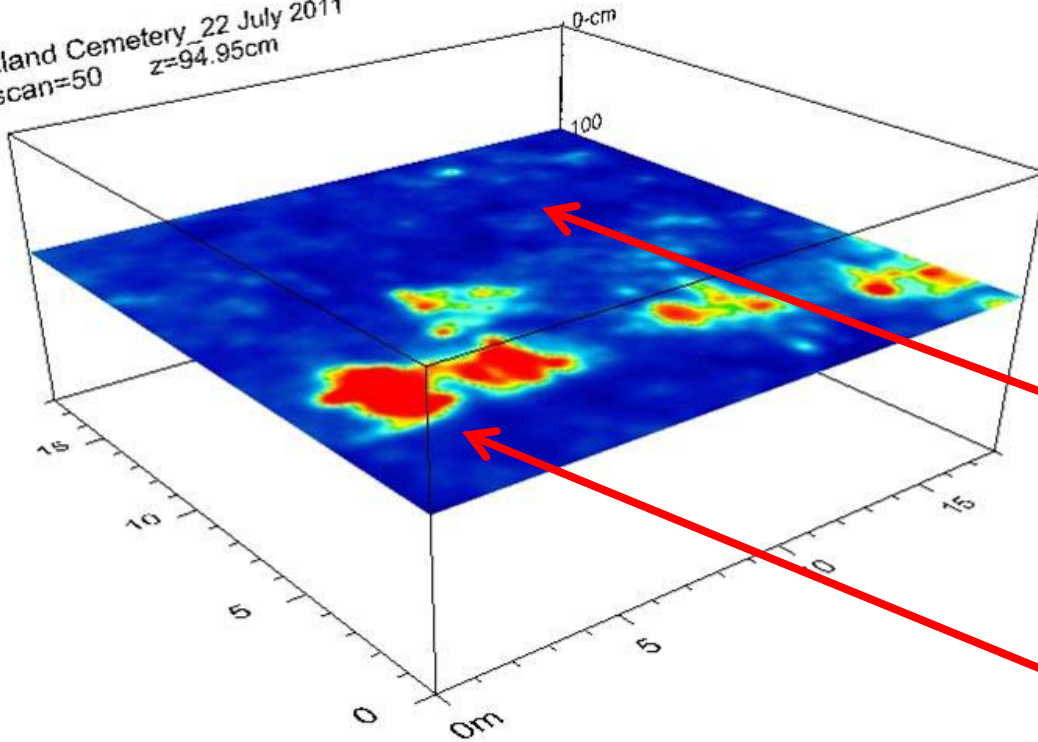
Graphics courtesy of GSSI, Inc.

GPR measures the reflection of a radio wave pulse from underground features



GPR Timeslice

Kirkland Cemetery 22 July 2011
zscan=50 z=94.95cm



Special computer software transforms the vertical GPR radargrams into horizontal “timeslices” creating a plan-view or “bird’s eye” view of the area

Blue areas are less dense, less reflective surfaces

Red areas are more reflective anomalies

Bring out the Public!



Groundwork for Outreach

RENEE WILSON:

Research Translator/
Public Relations for
Rookery Bay National
Estuarine Research
Reserve





Descent Families: Chris Durfey Kirkland and her Mom Josie Kirkland









WGCU

Radio Coverage



PBS

FGCU Intern covered the initial event as it occurred...



A follow-up live radio station interview included:

- Kirkland Descendent Chris Durfey Kirkland
- Steve Bertone – Rookery Bay National Estuarine Research Reserve
- Rich Estabrook – FPAN Central
- Annette Snapp – FPAN Southwest



Post-Event Coverage

• Fort Myers News Press

naplesnews.com

Printer-friendly story
Read more at naplesnews.com

Historic cemetery research underway at Rookery Bay Reserve

Rebecca Williams, Staff Writer
Wednesday, July 27, 2011

Last week, resource managers with Rookery Bay National Estuarine Research Reserve, working with the Kirkland family and the Florida Public Archaeology Network (FPAN), moved forward with a historical research project. Thanks to Ground Penetrating Radar (GPR), the process of locating unmarked graves and marking the boundaries of a historic cemetery has become a little bit easier.

The Kirkland family cemetery, located in the Reserve on Shell Island Road, rests many of the Kirkland family pioneering ancestors. Several descendants still reside in the area today and have been working to trace and document their family roots. The cemetery is one place where gaps exist in their history, because while some graves are well marked, others are not.

According to archaeologists with FPAN, historic cemeteries have long been among Florida's most neglected historic resources. Until recently, there was no way of knowing what was buried under ground without digging, which, in some cases, can unintentionally destroy precious resources. Now, GPR is one of the best tools available to investigate and document these resources. It works like a boat fish finder, revealing "anomalies," or items of different density than the surrounding material, as it rolls across the ground.

With the help of several volunteers, Reserve staff and archaeologists with FPAN laid transects across the ground and rolled the GPR over each one. The device collected information from below strip by strip, and back at the lab software stitched the strips together to provide a more comprehensive image of what lies beneath.

While final results are still being analyzed, the information gathered during the survey suggests there are at least three unmarked graves, and possibly others. Then it will be up to the Kirkland descendants to piece together other clues as to who lies in those graves.

The Rookery Bay National Estuarine Research Reserve, managed by the Florida Department of Environmental Protection's Office of Coastal and Aquatic Managed Resources in cooperation with NOAA, encompasses 110,000 acres of coastal lands and waters between Naples and Everglades City. It serves as an outdoor classroom and laboratory for students and scientists from around the world.

Radar helps find long-buried bodies

Fort Myers News Press 7/23/11

Scientists hope Naples cemetery yields clues

BY LINDSAY DOWNEY
Special to The News-Press



PHOTO BY AMANDA INSCORE

THE NEWS-PRESS

Volunteer Gloria Salgo, left, helps Rich Estabrook survey the Kirkland Family Cemetery with ground penetrating radar Friday in south Naples. The Kirkland family is trying to find lost gravesites and give them proper headstones.

Right, the headstone for George Washington Kirkland is one of 75 he has in the cemetery.

News-Press staff writer Lindsay Downey

Archaeologists rolled a digital device across Kirkland Family Cemetery at Rookery Bay on Friday, searching for corpses. Rich Estabrook, descendant for the Florida Public Archaeology Network's central region, pushed a \$20,000 ground-penetrating radar machine up and down rows on an 18-by-18 plot at the Naples cemetery, part of a historic shell mound.

"This allows you to find resources without disturbing the ground, which in the case of a cemetery is very important," said Fort Myers resident Gloria Salgo, a volunteer for FPAN's southwest regional office, based at FPAN.

Members of FPAN and Rookery Bay were out to discover whether additional corpses rest beneath the sediment. They hope to delineate boundaries and add permanent markers as well as learn more about the area's early settlers.

When examined, 3-D images from the GPR will help locate better understand the cultural history of Southwest Florida, according to Renee Wilson, Rookery Bay

Let some archaeologists in on the secret.

marconews.com

Printer-friendly story
Read more at marconews.com

Historic cemetery research underway at Rookery Bay

Submitted

Friday, July 29, 2011

Resource managers with Rookery Bay National Estuarine Research Reserve, working with the Kirkland family and the Florida Public Archaeology Network (FPAN), have moved forward with a historical research project. Thanks to Ground Penetrating Radar (GPR), the process of locating unmarked graves and marking the boundaries of a historic cemetery has become a little bit easier.

The Kirkland family cemetery, located in the Reserve on Shell Island Road, rests many of the Kirkland family pioneering ancestors, who were among the first families to establish a homestead along Henderson Creek. This island community, known as the Little Marco Settlement, dates back to the 1880s and also included residents along Hall Bay, Cannon Island, and Little Marco Island.

Several descendants still residing in the area today have been attempting to trace their family roots. The cemetery is one place where gaps exist in their history, because while some grave sites are well marked, others are not. The boundaries of this cemetery have never been officially documented, while another site nearby is suspected of housing more unmarked remains, based on an oral account received from another family's matriarch who also grew up in the area.

According to archaeologists with FPAN, historic cemeteries have long been among Florida's most neglected historic resources. Until recently, there was no way of knowing what was buried under ground without digging, which, in some cases, can unintentionally destroy precious resources. Now, Ground Penetrating Radar (GPR) is one of the best tools available to investigate and document these resources. It works like a boat fish finder, revealing "anomalies," or items of different density than the surrounding material, as it rolls across the ground.

With the help of several volunteers, Reserve staff and archaeologists with FPAN laid transects across the ground and rolled the GPR over each one. The device collected information from below strip by strip, and back at the lab software stitched the strips together to provide a more comprehensive image of what lies beneath.

While final results are still being analyzed, the information gathered during the survey suggests there are at least three unmarked graves, and possibly others. It will be up to the Kirkland descendants to piece together other clues as to who lies in those graves.



AMANDA INSCORE/THE NEWS-PRESS

Chris Kirkland, left, and her mother Josie Kirkland are hoping to find out the locations of the gravesites of Chris Kirkland's grandfather and great grandfather at the Kirkland Family Cemetery in south Naples.

RADAR

Continued from B1

About a dozen marked and three unmarked graves for members of the Kirkland family — who settled in the area in the 1800s — are known to be at the cemetery, Naples archaeologist Matthew Betz said.

Naples resident Chris Durley, a 53-year-old Kirkland descendant, watched as the GPR maneuvered past small headstones, one adorned with miniature American flags for her father, World War II veteran Harrison Kirkland, who died in 1987.

"It's amazing," Durley said of the research. "I can't wait to find out how many graves are out here. That's the big question."

As Estabrook pushed the lawn mower-like device, it recorded reflections of pulse radio waves sent to the ground. Black-and-white lines on the GPR screen darkened.

The anomalies suggested corpses researchers previously were unaware of who had been buried near the marked graves closest to Shell Island Road, but not on the opposite side of

the cemetery, Estabrook said.

FPAN members will use computers to analyze data and better estimate the number of graves. They plan to work with Durley and other descendants to collect biographical information for those who might be buried at the cemetery.

"They'll be able to stitch all these pieces together into the bigger picture," Wilson said.

FCU environmental studies student Amanda Maltz, 22, of Bonita Springs, was among about a dozen people who observed the research and took turns assisting Estabrook with the GPR.

"It's interesting to come out and do something other than dredge through the swamp, like I usually do. I'm eager to get my hands on it," she said of the GPR.

— Chris Durley, a 53-year-old Kirkland descendant

• Naples Daily News

• Marco Eagle

FPAN Event uses GPR Technology

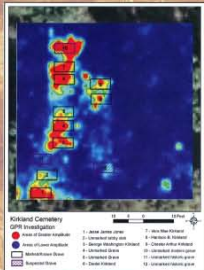
July 22, 2011



FPAN Central Region Director, Rich Estabrook, guides Kirkland Family descendant, Chris Kirkland Durfey as she pushes the GPR equipment through a portion of the Kirkland Family Cemetery at Rookery Bay National Estuarine Research Reserve.



GPR or ground-penetrating radar equipment uses radar pulses to investigate the soil below the ground's surface. When used in disturbed areas, the radar reflects differently. The GPR shown above is mounted between the wheels of the stroller. A monitor at the handle is used to start and stop the machine as well as to receive "realtime" data.



This map shows some of the results from the GPR survey. Strong radar reflections appear in red which indicate subsurface anomalies at a depth of 90-101 centimeters beneath the ground's surface. Many of these strong reflections match up with known grave sites and other strong signals suggest unmarked burial locations. GPR can help locate both marked and unmarked burials so that we can better understand these places of contemplation and community.



FPAN Poster at FGCU Offices

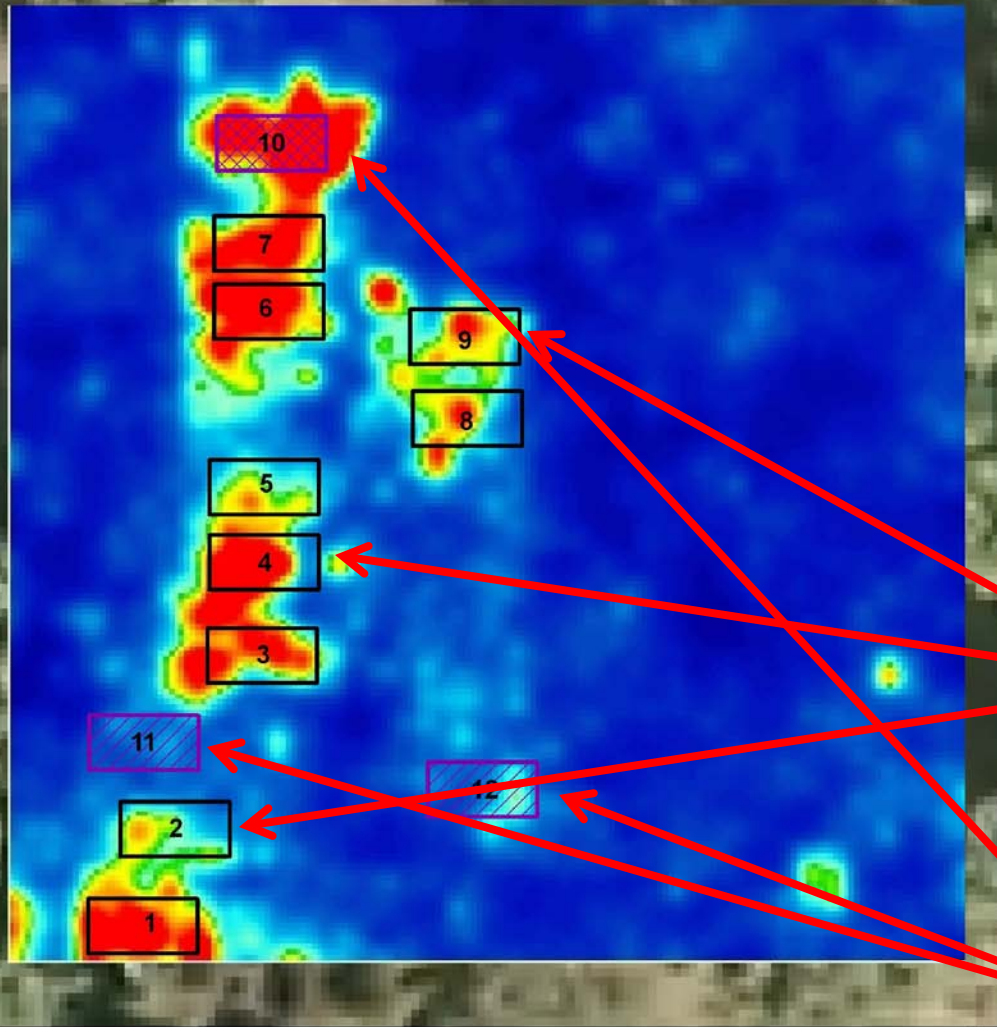
Discover Southwest Florida Archaeology

FPAN offers "hands-on" opportunities for citizens and visitors to participate in archaeological research projects that help us learn more about our heritage. We invite you to participate!

Kirkland GPR Initial Results

Nine confirmed
grave locations

Three
suspected new
grave locations



Kirkland Cemetery
GPR Investigation

- Areas of Greater Amplitude
- Areas of Lower Amplitude
- Marked/Known Grave
- Suspected Grave

- | | |
|--------------------------------|------------------------------|
| 1 - Jesse James Jones | 7 - Vera Mae Kirkland |
| 2 - Unmarked tabby slab | 8 - Harrison B. Kirkland |
| 3 - George Washington Kirkland | 9 - Chester Arthur Kirkland |
| 4 - Unmarked Grave | 10 - Unmarked modern grave |
| 5 - Unmarked Grave | 11 - Unmarked historic grave |
| 6 - Daniel Kirkland | 12 - Unmarked historic grave |

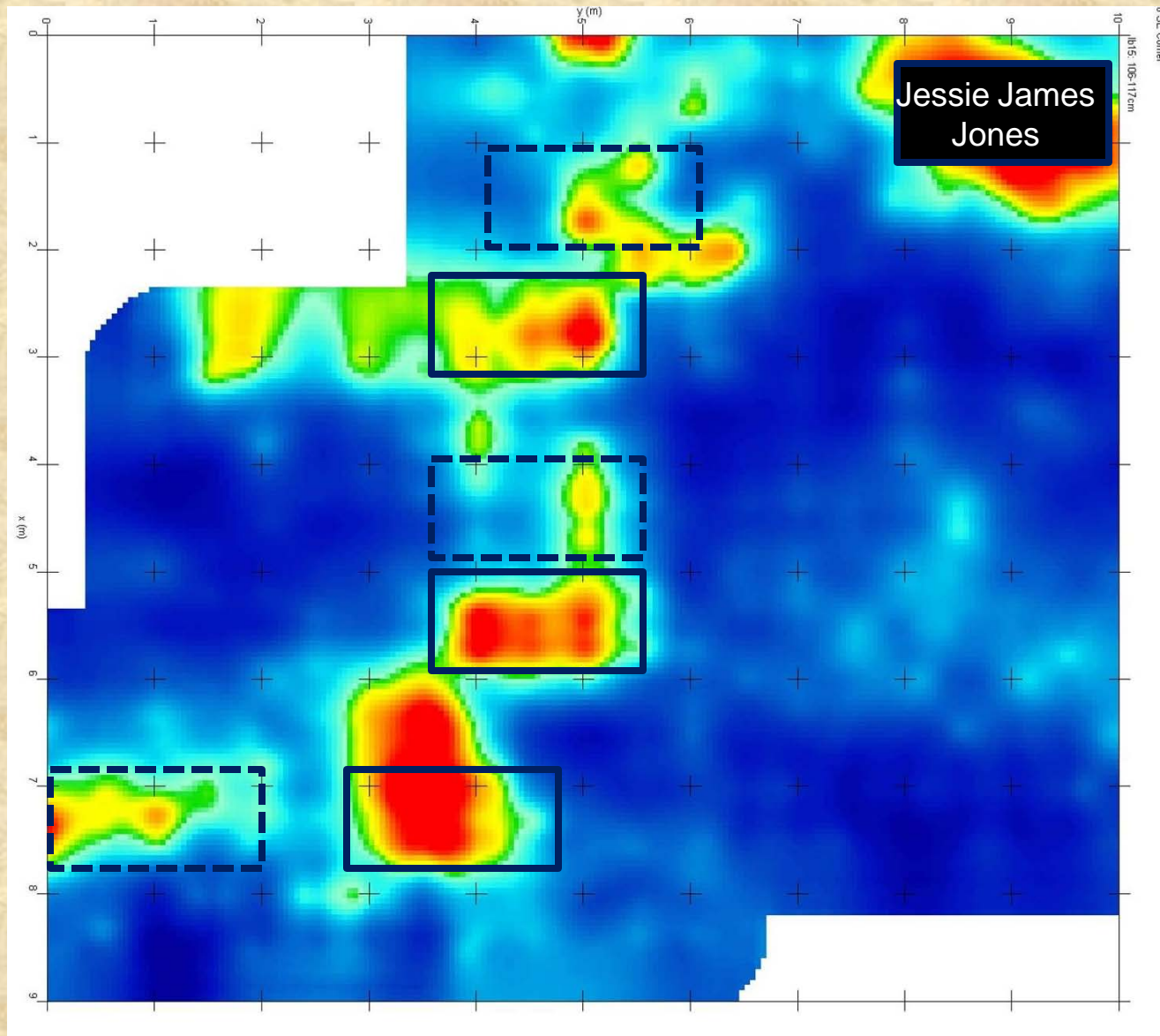
More Fieldwork!



GPR Survey from Hell!



Kirkland Grid 2 Results



Local Television Stations

- Channel 2:

<http://www.winknews.com/Local-Florida/2011-07-22/Solving-mysteries-one-unmarked-grave-at-a-time>

- Channel 5: WINK News

<http://www.winknews.com/Local-Florida/2011-07-22/Solving-mysteries-one-unmarked-grave-at-a-time>

Many Thanks to ~

- Chris Durfey Kirkland
- Josie Kirkland
- Matthew Betz ~ Archaeologist
- Renee Wilson ~ Rookery Bay Preserve
- Christine Brown ~ Grid Two Volunteer
- All of the many people who helped out in the field, even in the rain and with swarms of mosquitoes!

