

# SUwanne suture and GA Rift (SUGAR) Experiment: Part 1



March 2-23, 2014

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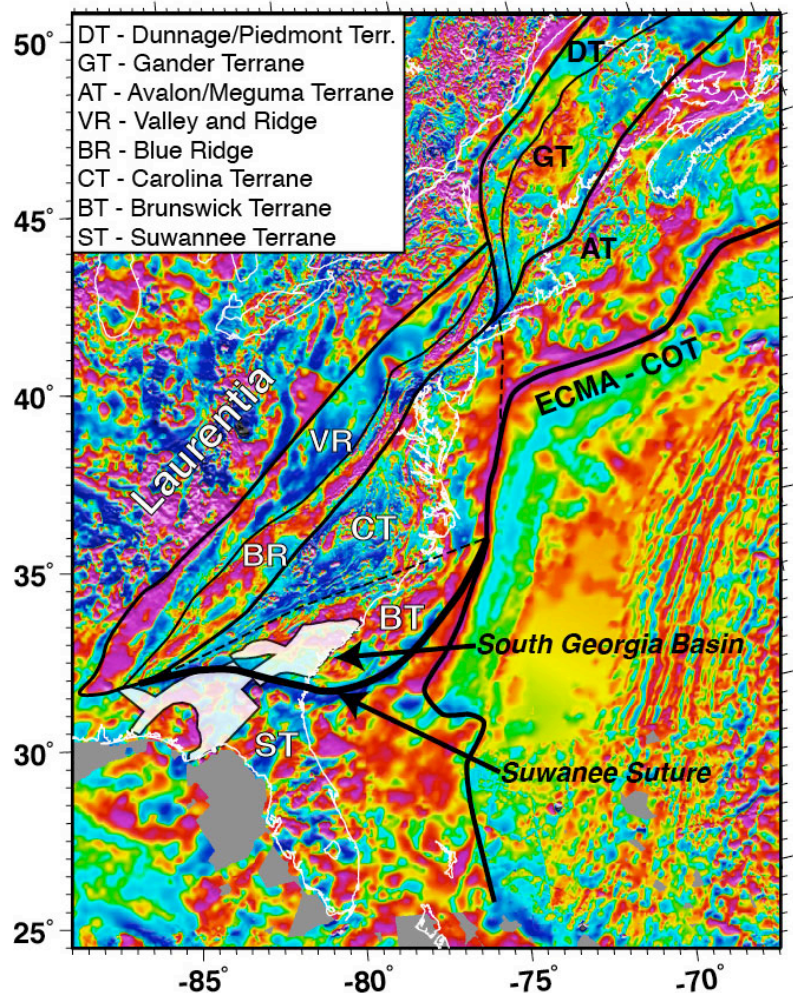
## 01. Summary of scientific objectives and outcomes

**Objectives.** The South Georgia Basin has been shaped by the most significant geologic events involved in building the eastern North American continent. It is the largest of a series of failed Mesozoic rift basins that formed during the breakup of Pangea. It straddles the Suwannee suture, the only well-defined remnant of the Alleghenian suture that joined North America and Gondwana, forming Pangea. The extensional structures of this rift basin thus reflect the contrasting rheologies of these juxtaposed lithospheric terranes and the suture that joined them. The South Georgia Basin also lies at the center of the Central Atlantic Magmatic Province (CAMP), one of the largest igneous provinces in the world, and thus holds an as yet unmeasured volume of this magmatic event as sills within the basin's sediments and intrusions within the crust. However, the South Georgia basin is buried beneath the Coastal Plain of the southeastern U.S., and very little is known about the crustal or lithospheric structure of this or any of the other rift basins that flank the U.S. Atlantic passive margin.

The South Georgia Basin is a scientifically rich feature. This basin records the construction of the North American continent by amalgamation of exotic terranes, the initiation of extension that ultimately led to the breakup of Pangea, the involvement of sutures and other pre-existing structures in extension, and the distribution of CAMP magmatism and the interaction of shallow intrusions with basin sediments.

The scientific goals of the SUGAR project are capitalize on this regional richness to understand the roles of sutures and other pre-existing structures on localizing deformation and magmatism during post-orogenic extension, and to quantify the distribution and volumes of CAMP magmatism in the region.

To achieve these goals, we are using active-source seismic refraction to image the crustal structure of this rift system, including the crustal-thinning profile beneath the basins, the crustal expression of the Alleghenian suture, and velocity anomalies within the crust that may be

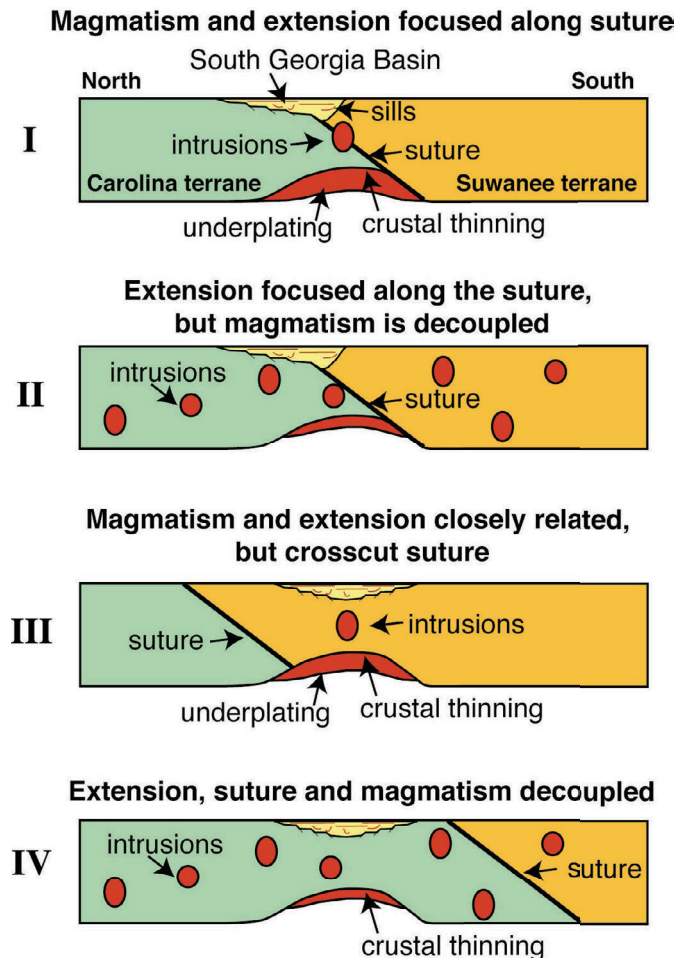


**Fig. 1** Magnetic anomaly map with South Georgia Basin extent (white) from *McBride et al.* (1989) and Suwannee Suture location (black) inferred from the Brunswick magnetic anomaly indicated.

indicative of rift- or CAMP-related magmatic additions. The project involves collection of refraction data along two main profiles, each ~300 km, crossing the South Georgia Basin and

Suwanee suture in the east and in the west. Recent studies based on gravity, magnetics and sub-crop data indicate that South Georgia basin extension was focused south of the suture to the west and north of the suture to the east. The two SUGAR profiles are designed to capture changes in internal basin structure that may be indicative of extension within these two presumably distinct tectonic provinces.

This report describes the field program that acquired data along the western profile, which crosses the South Georgia basin where it appears to lie south of the Suwanee suture.



**Fig. 2:** Cartoon illustrating possible end-member relationships between rift magmatism, the Suwanee Suture and extension around the South Georgia Basin.

**Outcomes.** In March 2014, we acquired seismic refraction data along a ~300-km-long profile in southwestern Georgia and northernmost Florida (Figure 1). Eleven shots, varying in size from 100 to 1800 lb., were recorded on 1193 “Texan” seismographs deployed primarily along state and county roads across Georgia. Shot spacing varied from ~25 to 50 km, and Texans were spaced at ~250 m. Initial assessment of the shot gathers indicates excellent data quality (see data examples). Nearly all shots were recorded across the entire profile, including small ~100 lb shots at L1-06 and L1-07. The apparent velocities of first arriving, turning waves vary from <2 km/s to >8 km/s, indicating that we are recording energy from the basin, crust and upper mantle. We also observe bright reflections on many instruments. These arrivals will provide a rich trove of information the crustal structure of the South Georgia basin from which we can glean new insights on its formation and evolution.



## 2. Participants

Including contact information for the field team

### Principal scientists:

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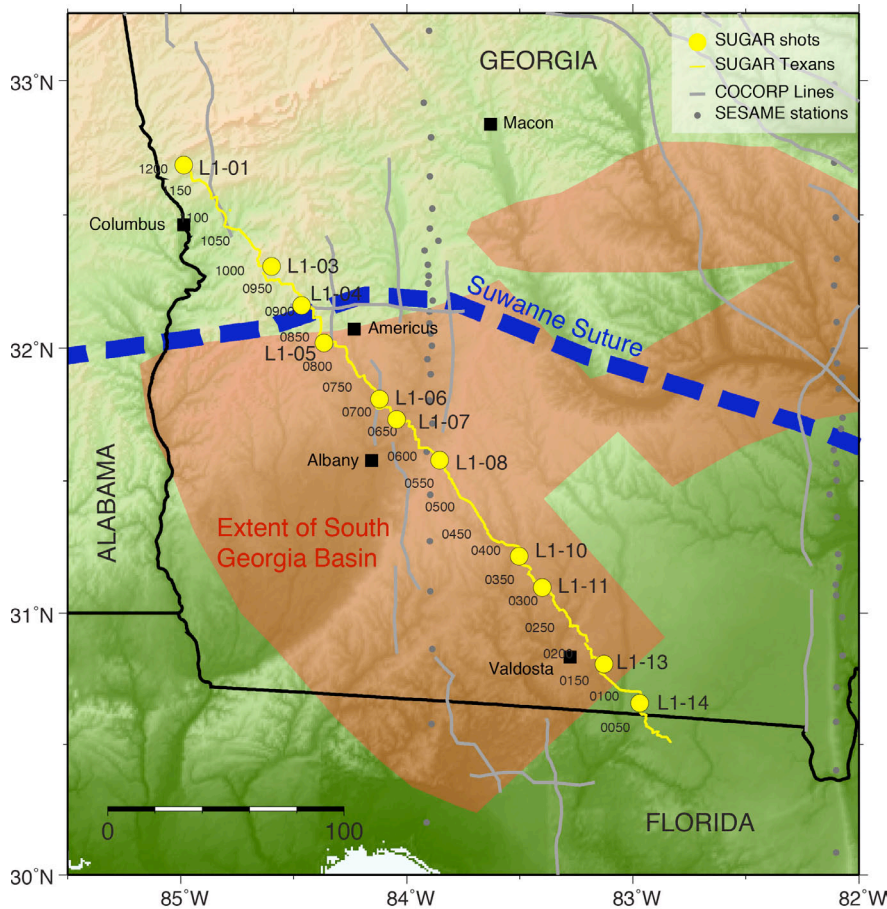
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### 3. Operations

Acquisition of seismic data along Line 1 of the SUGAR experiment took during an ~1-month-long field program in March, 2014. This effort involved a number of operations, with some beginning well before field program itself. The main operations consisted scouting/permitting (line locations, road permits, shot locations, shot-site permissions), logistics (securing a field center, participants, vehicles and choreography), shot operations (surveying, drilling, loading, detonation, and remediation), and instrument operations (shipping, programming, deploying, recovering, data offload and QC). Here we summarize some details of these operations.

#### 3.1 Scouting and permitting

*Line siting.* Scouting and permitting for Line 1 began with identification of the transect location, which we moved relative to the location in the proposal. The primary considerations for location were scientific and were informed by recent work from Jim Knapp’s group at the University of South Carolina. That group analyzed existing seismic and potential-field data to create a revised map (not available when we wrote the proposal) of the sub-basins that make up the larger South Georgia Basin system. We sited Line 1 to run perpendicular to the large basin segment that lies entirely south of the BMA. With that general transect chosen, secondary considerations of road access, avoiding large population centers, and proximity to a field-center site led to a final transect location. The PIs drove the line in October 2012 to finalize the “deployment” line (the particular sequence of roads along which instruments were deployed) and to scout shot sites.



**Fig. 3:** SUGAR Line 1 shots (yellow dots) and Texans (station numbers) with major tectonic elements and other existing datasets in this region.



*Road permitting.* The deployment line ran along a combination of county and state roads, and so permitting for the seismograph deployment involved contacting both state and county officials. The transect extending through two Georgia state transportation districts, Districts 3 and 4. Permits for state roads in these districts were easily obtained after sending letters to the two district superintendents. The deployment line ran through 11 Georgia counties and 1 Florida county. For most of these counties, right-of-way permits for deployments were obtained after letters and e-mails were sent to county road superintendents. In three cases county boards needed to agree on the permits after discussion at scheduled meetings. In one instance (Marion Co., GA), a personal visit to the road department was necessary in order to obtain permission.

*Shot site permitting.* Siting and permitting shots was far more labor intensive than anticipated. Prior to this experiment, a large scale crustal refraction survey had not been conducted on the east coast south of New York since the 1960's, and so there was little data upon which to base expectation of effort. The source team's abundant experience permitting shot sites in the western U.S. did not readily translate to the heavily populated and cultivated southeastern U.S.

Seven shots (01, 03, 04, 10, 12, 13, 14) were sited on land owned or managed by timber companies. Once we became familiar with the types of insurance these companies required, these sites tended to be easier to permit than sites on privately owned land. However, considerable effort and time was spent, and ultimately wasted, in discussions with three timber companies that denied permission. Six shots (05, 06, 07, 08, 09, 11) were sited on privately owned land. A major difficulty with most of these sites was locating and contacting the landowners once they had been identified based on public tax records, as they didn't reside on the property. For shots in Worth County, a personal trip to the county tax assessor's office was necessary to identify landowners, as this county does not have online access to property records. One shot (02) was sited on the U.S. Army base Fort Benning. Permits were obtained with the help of the civilian staff in the Environmental Department. For all of these sites, initial contact was made via letter, with a follow-up contact via phone. The shot-site permitting efforts began early in 2013 and extended, for shots 05 and 10, until just days before the sites were drilled.

### **3.2 Logistics**

*Field center and vehicles.* We chose Americus, GA, as our base of operations because of its central location along the line and because of contacts we had made with Sam Peavey, a faculty member and seismologist at Georgia Southwestern State University (GSW). Peavey was able to secure us an excellent field center within an unused school gym on campus. In addition, the PIs, the source team, and the PASSCAL engineers stayed in a quiet dorm on campus, and easy walk to gym; and the campus facilities department received shipments of supplies as well as the shipment of instruments from PASSCAL.

The majority of the vehicles used for the field program were rented as a block of 12 SUVs from Enterprise Rent-A-Car in Americus, conveniently located across the street from the hotel where the balance of the participants stayed.

*Participants.* Participants consisted of 2 students and a post-doc from LDEO, 9 students from UTEP recruited by Harder, 18 students from universities in Georgia, and 4 students from other universities in the southeast. The 22 students unaffiliated with the PIs responded to solicitations for participants that targeted students in the southeast. That recruitment effort began early in 2014.



**Fig. 4:** Dan Lizarralde giving an introduction to the field team in GSW's Florrie Chappell gym, our field center.

### **3.3 Shot operations: local surveys, drilling, loading, shooting, remediation**

The SUGAR Line 1 shots were drilled and loaded between March 3 – 19 by the UTEP source team and AE Drilling Company. Drilling and loading at most sites required 1 to 1.5 days. We originally planned for fifteen shots along this profile. We could not drill L1-15 in northern Florida due to the expense and time required for Florida state permitting for one shot. The hole at L1-12 was unstable; it collapsed several times during drilling and required re-drilling. During loading, one of the explosives units turned sideways in the hole too deep to be retrieved but too shallow to be detonated. The hole was filled in and abandoned. Rainy conditions during our fieldwork rendered access to L1-09 too difficult; the drill rig got stuck trying to access the site. Finally, we ran out of time to drill and load L1-02 (Fort Benning) during the time frame of the deployment. The 11 shots were detonated during the nights of March 18 and 19.



**Fig. 5:** The source team and Keesbatner Loembet (GSW) loading shot L1-04.

*Shot design.* The shot design was a scaled up version of cartridge-based designs used by industry crews. Cartridges were assembled at UTEP from 10" plastic irrigation pipe and lay-flat tubing. The explosive, bulk emulsion (Dyno-Nobel Titan 1000 SD) was pumped into cartridges at the shot site (see Figure 2). Each 2.5 ft. (0.76 m) long cartridge was designed to hold 100 lb. (45.4 kg) of emulsion. At first only 90 lb. was loaded into each cartridge because the pumping of bulk emulsion required the addition of water to keep the emulsion from sticking to the inside the hose. After the hose was bypassed, each cartridge could be filled with 100 lb. of emulsion. Once the cartridge was filled it was primed with one or more 0.45 kg boosters each with an electronic (Dyno-Nobel Geoshot) detonator in it. Electronic detonators have not previously been used in deep crustal seismic experiments. The original idea was to lower these cartridges into 12" mud filled boreholes, however in many cases the mud was denser than the cartridges. This required cartridges to be pushed down boreholes with either loading poles or the drill rig. As many as 20 cartridges were loaded into a single borehole. None of the boreholes were cased and each was stemmed with cutting, a blast plug, crushed gravel and more cuttings after loading.



**Fig. 6:** Emulsion filled cartridges being prepared for loading at L1-14.

*Surveying.* Two of the shots sites, L1-06 and L1-07 within the Doherty plain, were located near the updip limit of the Floridian aquifer, which provides water for irrigation throughout southeastern Georgia. The carbonates of the Floridian lie very close to the surface throughout the Doherty plain, and there are numerous sinkholes and other karst features in the region. Shallow carbonate presents a complication for drilling and, more importantly, a risk of sinkhole formation, and so we conducted shallow refraction surveys at sites 06 and 07 in order to determine the depth to carbonate and inform shot design for these sites. Seismic profiles from these surveys are included in the *Data Examples* appendix. The profile at L1-06 shows a high-velocity refraction at the extreme end of the receiver spread, suggesting a likely limestone unit ~95 feet below the surface. We did not observe a similar high-velocity layer at site L1-07, which is down dip from L1-06, suggesting the limestone is deeper at that location. The land manager at this site had told us that the Floridian had been encountered at ~100' on their property, and so it is likely limestone exists below 95 feet and potentially as shallow as 100 feet near L1-07. Based on these surveys, shots L1-06 and 07 were designed and shot as shallow holes charged with only 100 lbs of emulsion.

The Line 1 shots were detonated by three teams on the nights of March 18 and 19. On March 18: Team 1, led by Harder, detonated shots L1-05, 06, 07, and 08; Team 2, led by Tina Carrick, detonated shot L1-04; and Team 3, let by Galen Kaip, detonated shots L1-10, 22, 13 and 14. On March 19: Harder and Kaip detonated shots L1-01 and 03.



*Remediation:* Most of the shots sites required only modest remediation, primarily involving backfilling with bentonite clay. Site L1-07 and L1-08 required additional sand and some backhoe work, which was arranged by the source team. Site L1-14 also required backhoe work, but that site was inaccessible after shooting due to heavy rain and flooding, and remediation was arranged and completed several weeks after shot detonation

### 3.4 Instrument (“Texan”) operations

RefTek RT 125 (a.k.a. “Texans”) dataloggers and OYO-Geospace GS11 4.5 geophones were used to record the explosive shot energy along Line 1. These instruments were provided by PASSCAL along with two engineers, Steve Azevedo and Derick Hess, who oversaw all aspects of in-lab Texan operations. Texan operations include instrument inventory, battery loading, instrument programming, assignment and checkout of instruments to teams, deployment and then recovery from the field, instrument cleaning, checking in of instruments, downloading data, post-deployment inventory, battery removal, and repacking.



**Fig. 7:** (top) Instruments arriving at the Florrie Chappell Gym at Georgia Southwestern University. (right) Steve Azevedo and Derick Hess prepare the Texans inside the gym.

There were 1193 Texan stations were deployed along the profile. A total of 34 undergraduate and graduate students and junior scientists were involved in deploying and recovering the Texans. Eight teams of two scouted and flagged the positions for Texans, and fifteen teams deployed and recovered the stations. Two days were required to flag all of the stations. The Texans were programmed by the PASSCAL engineers during the night of March 16, before the first deployment day. Three days were required for deployment. The deployment would have required less time if there had not been a problem with programming of the Texans. During the first deployment day, PASSCAL personnel discovered that the recording time windows were not set properly. Nearly half of the 1193 stations had been deployed at this point, and fixing the recording-window problem required the retrieval, reprogramming and redeployment of those

stations along with reprogramming of the stations which hadn't yet been deployed. We experienced rain (sometimes very heavy), thunderstorms, and relatively cool temperatures during the deployment.

The line was shot on the nights of March 18 and 19, and all but five Texans were recovered the following day in excellent weather. One team spent another half of a day looking for 3 missing Texans with a metal detector, and they were able to recover two of them.



**Fig. 8:** (*top left*) Chastity Aikens (Ga. Tech) plants a Texan and levels the geophone.

(*top right*) Nathan Miller (LDEO) digs a station hole while Meghan Jones (U. Miami) logs metadata.

(*right*) Natalie Accardo (LDEO) rounds up loast Texans with the help of a ferrous metal detector.



During the final two days of the field program, data were downloaded from all of the Texans by the Azevedo and Hess, the PI's assembled and quality controlled the metadata using GPS waypoints and written field sheets, and a SEG-Y format dataset of gathers was created for all shots using the *tsp* program written by Steve Harder. As the data examples show, an excellent dataset was acquired for SUGAR Line 1.

## 4. Log of events

**Feb 25:** DL arrives in Americus.

**Feb 28:** DS arrives in Americus.

**Feb 25 – March 2:** Scouting of deployment line, contacts and follow up with landowners, purchase of supplies, etc..

**March 2:** UTEP source team arrives in Americus in the evening.

**March 3:** Most of UTEP source team heads south to L1-14, meets drillers. GK, DS and DL scout possible location for L1-05 (Satterfield property) and get very stuck and pulled out by Anthony from neighboring property. GK and DL do seismic refraction at L1-06; Donna visits Satterfields (L1-05 possibility) and Taylor Brown at Chokey Plantation (L1-07).

**March 4:** Attempted to drill L1-14, but needed longer conductor to drill the hole because of the sand. DS and DL do further scouting of the line, contacts and follow up with landowners and purchasing supplies.

**March 5:** Drillers obtained another conductor, drilled and loaded L1-14.

**March 6:** Moved rig to L1-13, drilled and loaded L1-13, and moved rig to L1-12.

**March 7:** Tried to drill L1-12 several times. Lots of washouts. Tried to load, then one of charges went sideways in the hole. Abandoned hole. PASSCAL shipment arrives at GSW. Unload two palletes at the gym, then store the rest in the GSW warehouse.

**March 8:** Drilled L1-11, and took drillers to L1-09 and got stuck. AH arrives in the evening.

**March 9:** Rig pulled out from L1-09, and moved to L1-08. Drilled and loaded L1-08. Drillers broke down there. DL, DS and AH do shallow refraction at L1-07 and data analysis.

**March 10:** Drilled and loaded L1-07, moved to L1-06 and set up.

**March 11:** Drilled and loaded L1-06, drove back south to L1-10. Got stuck again. The rest of PASSCAL shipment moved from warehouse to gym by truck, de-palletized outside, and moved into gym by inmates. SA and DH from PASSCAL arrive in Americus in the evening.

**March 12:** Drilled and loaded L1-10, drove back to L1-05. DS and DL finished preparation of maps, supplies, and notes for field teams. SH meets with Gahl (Timberlands II, L1-03). Communication with L1-01 (Burt) and L1-02 (Fort Benning). PASSCAL sets up work space and begins Texan prep. Scouters arrive in Americus in the evening/night/late night (3 am arrival for UTEP van!)

**March 13:** Drilled and loaded L1-05. Began drilling at L1-04. Seven teams begin scouting and flagging the line. PASSCAL continues Texan prep.



**March 14:** Finished drilling and loading L1-04. Moved rig to L1-01 (drillers go home for the weekend). Turbo on water truck broke on the way to L1-01; towed to Columbus. Eight teams finish flagging the line. PASSCAL continues Texan prep.

**March 15:** Arrival of the rest of the field party and orientation at 2 pm in the gym. PASSCAL programs Texans (with help from DS and DL).

**March 16:** Fifteen deployment teams arrive at gym around 6:45 am to pick up equipment and head out for the day. They leave by 7:10 am, and begin deploying in very rainy conditions. At 2 pm, SA discovers that Texan programming is 12 hours off. We contacted as many teams as possible and instruct them to pull out the Texans and bring them back to the gym for reprogramming. Three teams recovered only some or no Texans. SA and DH reprogrammed Texans as they came back.

**March 17:** Drillers came back, but road to L1-01 was too bad to drive after rain. Fifteen teams go out with reprogrammed Texans to redeploy (also in the rain), and pick up unprogrammed Texans if needed. Over half of Texans deployed. All but 25 Texans with bad programming recovered and reprogrammed. 25 Texas were on a road near southern end of the Line that was flooded during rain. Crew from GA Southern and a couple of others departed.

**March 18:** Bulldozer pulled all the trucks into L1-01. Drilled and loaded L1-01. This site was drilled with air and a hammer drill, and bulk loaded. Moved rig to L1-03. Finished deployment of Texans with 12 teams. 25 bad Texans pulled out by two teams and reprogrammed in hotel room in Valdosta by SA, then redeployed. That night, three shooting teams shot L1-04, L1-05, L1-06, L1-07, L1-08, L1-10, L1-11, L1-13 and L1-14. Some of field crew watches L1-05.

**March 19:** Drilled and loaded L1-03. Day off for field crew. Reinforcements for field crew arrive from UGA. Shot L1-03 and L1-01. Some of field crew watches L1-03.

**March 20:** Fifteen field crews recover nearly all Texans (five are missing). PASSCAL begins downloading data. Most of field crew departs.

**March 21:** Continued data download, metadata compilation. Cleaned and returned most field vehicles to Enterprise. Cleaned Texans and cases. One team goes to search for three missing Texans, and recovers two. Remediation of drill sites begins.

**March 22:** Continued remediation at drill sites. PASSCAL finishes prep of data. Packing.

**March 23:** Departure of most of field team from Americus.

**March 24:** PASSCAL equipment is palletized and shipped.

## 5. Shot information

### 5.1 Shot site, hole and charge information

| Shot # | Latitude (deg) | Longitude (deg) | Elev. (m) | Julian Day | Time        | TOC (ft) | TD (ft) | Charge (lbs) |
|--------|----------------|-----------------|-----------|------------|-------------|----------|---------|--------------|
| 1      | 32.68682       | -84.98628       | 177.49    | 79         | 03:05:00.02 | 45       | ?       | 1400         |
| 3      | 32.30797       | -84.59778       | 195.2     | 79         | 03:10:00.02 | 53.5     | 66      | 500          |
| 4      | 32.16044       | -84.46409       | 174.68    | 78         | 03:00:00.02 | 53       | 67      | 500          |
| 5      | 32.02107       | -84.36591       | 143.68    | 78         | 03:10:00.02 | 56       | 68.5    | 500          |
| 6      | 31.80909       | -84.11940       | 88.1      | 78         | 04:25:00.02 | 45       | 47.5    | 100          |
| 7      | 31.73172       | -84.04466       | 96        | 78         | 05:11:00.02 | 42.5     | 45      | 100          |
| 8      | 31.57942       | -83.85434       | 136.41    | 78         | 06:10:00.02 | 50       | 55      | 200          |
| 10     | 31.21521       | -83.50206       | 78.34     | 78         | 07:05:00.02 | 57.5     | 70      | 400          |
| 11     | 31.09683       | -83.40052       | 79.23     | 78         | 06:05:00.02 | 47.5     | 57.5    | 400          |
| 13     | 30.80598       | -83.12720       | 52.94     | 78         | 04:35:00.02 | 45.5     | 63.5    | 450          |
| 14     | 30.65708       | -82.96895       | 54.42     | 78         | 03:05:00.02 | 107      |         | 1800         |

### 5.2 Shot site owner and contact information

| Shot | Landowner   | Contacts  |
|------|---|---|
| 1    | Alexander Brothers Lumber Co.<br>1339 13th Avenue<br>Columbus, GA 31901             | Bruce Burt (manager)<br><a href="mailto:burt475@windstream.net">burt475@windstream.net</a><br>706-975-4910<br><br>Richard Saunders (owner)<br>fr2magoo2@aol.com<br>706-249-6891 |
| 3    | Timberlands II<br>c/o Roger Presnell<br>P.O. Box 545<br>Lumpkin, GA 31815           | Tim Gahl<br>229-838-4418<br>tgahl@frcemail.com  |
| 4    | Plum Creek Timberlands LB<br>987 Griswoldville Rd<br>Macon, GA 31217                | Justin Zdunczyk<br>706-583-6715 (office)<br>706-340-5373 (cell)<br>justin.zdunczyk@plumcreek.com  |
| 5    | Lyanne Hancock<br>Cleveland L Hancock JR<br>130 E Rutherford St<br>Athens, GA 30605 | Lyanne and Steve Hancock<br>lhancock100@gmail.com   |

## 5.2 Shot site owner and contact information (cont.)

| Shot | Landowner   | Contacts   |
|------|---|--|
| 6    | W.D. and Mary E. Wingate<br>Cross Creek Plantations LLC<br>P.O. Box 70024<br>Albany, GA 31707 | Doug Wingate<br>Georgia Farm Services<br>229-759-6468<br>georgiafarmsrcv@bellsouth.net   |
| 7    | James F. Taylor<br>2700 Palmyra Rd<br>Albany, GA 31702  | Taylor Brown (manager)<br>229-881-7200 (cell)<br>tbrown@fredtaylorcompany.com<br><br>Mark Taylor (owner)<br>marktaylor@fredtaylorcompany.com<br>om<br>229-883-5200 |
| 8    | S. Cecil Musgrove and<br>Royce McCrary<br>1900 Dawson Road<br>Albany, GA 31707                | Cecil Musgrove<br>nan@5pointsagency.com<br>229-881-2626  |
| 10   | The Langdale Company<br>P.O. Box 1088<br>Valdosta, GA 31603                                   | Jim Fielding<br>jfielding@langdalecompany.com<br>229-333-2576, x202  |
| 11   | Adel Industrial Dev. Authority<br>112 N. Parrish Ave.<br>Adel, GA 31620                       | Howard McClain (Judge)<br>229-896-7644<br><br>John H. Flythe (City Manager)<br>229-546-5457  |
| 13   | The Langdale Company<br>P.O. Box 1088<br>Valdosta, GA 31603                                   | Jim Fielding<br>jfielding@langdalecompany.com<br>229-333-2576, x202  |
| 14   | Superior Pine Products<br>P.O. Box 278<br>Fargo, GA 31631                                     | Robbie Lee<br>912-637-5261   |



## 6. Scouting, deployment, and recovery teams

### Scouting/Flagging

| Team | Person 1        | Person 2            |
|------|-----------------|---------------------|
| 1    | Natalie Accardo | Antonio Legarda     |
| 2    | Arturo Ramirez  | Gleb Chupakin       |
| 3    | James Gibson    | Belem Amador        |
| 4    | Chastity Aiken  | Sandra Hardy        |
| 5    | Abdusalam Agail | Semir Sarajilic     |
| 6    | Jonathan Lucero | Felix Ziwu          |
| 7    | Nathan Miller   | Joshua Pegues       |
| 8    | Ashley Nauer    | Kleesbatner Loambat |

| Flagging                    | # of insts | Stations    | Time to stations | Wpt File  |
|-----------------------------|------------|-------------|------------------|-----------|
| Team 1-2                    |            | 1           | 2:30             | 0001-0400 |
|                             | 60         | 60          | 2:20             |           |
|                             | 60         | 61          | 2:20             |           |
|                             | 60         | 120         | 2:10             |           |
| Team 3-4                    |            | 121         | 2:10             | 0001-0400 |
|                             | 70         | 190         | 1:45             |           |
|                             | 75         | 191         | 1:45             |           |
|                             | 75         | 265         | 1:35             |           |
| Team 5-6                    |            | 266         | 1:35             | 0200-0600 |
|                             | 77         | 342         | 1:30             |           |
|                             | 95         | 343         | 1:30             |           |
|                             | 95         | 437         | 1:10             |           |
| Team 7-8                    |            | 438         | 1:10             | 0500-0900 |
|                             | 88         | 525         | 0:35             |           |
|                             | 24         | 526         | 0:35             |           |
|                             |            | 549         | 0:19             |           |
|                             | 83         | 550         | 0:35             |           |
|                             | 83         | 632         | 0:19             |           |
| Team 9-10                   |            | 633         | 0:19             | 0500-0900 |
|                             | 100        | 732         | 0:16             |           |
|                             | 104        | 733         | 0:16             |           |
|                             | 104        | 836         | 0:42             |           |
| Team 11-12                  |            | 837         | 0:42             | 0800-1200 |
|                             | 95         | 931         | 0:42             |           |
|                             | 90         | 932         | 0:42             |           |
|                             | 90         | 1021        | 0:42             |           |
| Team 13-14<br>(Ft. Benning) |            | <b>1022</b> | 0:42             | 0800-1200 |
|                             | 90         | <b>1111</b> | 1:10             |           |
|                             | 89         | 1112        | 1:10             |           |
|                             | 89         | 1200        | 1:30             |           |

### Deployment Days 1-2

| <b>Team</b> | <b>Person 1</b> | <b>Person 2</b>     |
|-------------|-----------------|---------------------|
| 1           | Natalie Accardo | Nicolas Djohan      |
| 2           | Antonio Legarda | Wei-Fang Sun        |
| 3           | Arturo Ramirez  | Stan Shymanovsky    |
| 4           | Gleb Chupakin   | Afshan Shahik       |
| 5           | James Gibson    | Caroline Farr       |
| 6           | Belem Amador    | David Bradley       |
| 7           | Chastity Aiken  | Qianying Lin        |
| 8           | Sandra Hardy    | Kleesbatner Loembat |
| 9           | Abdusalam Agail | Ashley Nauer        |
| 10          | Semir Sarajilic | Allie Hayser        |
| 0           | Dan             | Donna               |
| 11          | Jonathan Lucero | Xiaofeng Meng       |
| 12          | Felix Ziwu      | Bobby Jones         |
| 13          | Nathan Miller   | Meghan Jones        |
| 14          | Joshua Pegues   | Jake Swanson        |

### Deployment Day 3

| <b>Team</b> | <b>Person 1</b> | <b>Person 2</b>     |
|-------------|-----------------|---------------------|
| 1           | Natalie Accardo | Donna Shillington   |
| 2           | Arturo Ramirez  | Stan Shymanovsky    |
| 5           | James Gibson    | Belem Amador        |
| 6           | Nathan Miller   | Meghan Jones        |
| 7           | Chastity Aiken  | Gleb Chupakin       |
| 8           | Sandra Hardy    | Kleesbatner Loembat |
| 9           | Abdusalam Agail | Ashley Nauer        |
| 10          | Semir Sarajilic | Wei-Fang Sun        |
| 0           | Dan Lizarralde  | Afshan Shahik       |
| 11          | Jonathan Lucero | Xiaofeng Meng       |
| 12          | Felix Ziwu      | Antonio Legarda     |
| 14          | Joshua Pegues   | Jake Swanson        |

### Recovery Day 1

| <b>Team</b> | <b>Person 1</b>     | <b>Person 2</b>   |
|-------------|---------------------|-------------------|
| 1           | Natalie Accardo     | Ryan Jubran       |
| 2           | Wei-Fang Sun        | James Thomson     |
| 3           | Arturo Ramirez      | Stan Shymanovsky  |
| 4           | Gleb Chupakin       | Afshan Shahik     |
| 5           | James Gibson        | Horry Parker      |
| 6           | Belem Amador        | Ashley Nauer      |
| 7           | Sandra Hardy        | Willian Wylie     |
| 8           | Kleesbatner Loembat | Mark Hiron        |
| 9           | Abdusalam Agail     | Nicolas Djohan    |
| 10          | Semir Sarajilic     | Sarah Welter      |
| 0           | Dan Lizarralde      | Donna Shillington |
| 11          | Jonathan Lucero     | Xiaofeng Meng     |
| 12          | Felix Ziwu          | Antonio Legarda   |
| 13          | Nathan Miller       | Meghan Jones      |
| 14          | Joshua Pegues       | Jake Swanson      |

### Deployment/Recovery team station assignments

|                     | Team                            | # of insts | Stations    | Time to stations | Wpt File  |
|---------------------|---------------------------------|------------|-------------|------------------|-----------|
| Scout Team<br>1-2   | Deploy Team 1                   |            | 1           | 2:30             | 0001-0400 |
|                     |                                 | 60         | 60          | 2:20             |           |
|                     | Deploy Team 2                   |            | 61          | 2:20             |           |
|                     |                                 | 60         | 120         | 2:10             |           |
| Scout Team<br>3-4   | Deploy Team 3                   |            | 121         | 2:10             |           |
|                     |                                 | 70         | 190         | 1:45             |           |
|                     | Deploy Team 4                   |            | 191         | 1:45             |           |
|                     |                                 | 75         | 265         | 1:35             |           |
| Scout Team<br>5-6   | Deploy Team 5                   |            | 266         | 1:35             | 0200-0600 |
|                     |                                 | 77         | 342         | 1:30             |           |
|                     | Deploy Team 6                   |            | 343         | 1:30             |           |
|                     |                                 | 83         | 425         | 1:10             |           |
| Scout Team<br>7-8   | Deploy Team 7                   |            | 426         | 1:10             |           |
|                     |                                 | 88         | 513         | 0:35             |           |
| Scout Team<br>9-10  | Deploy Team 8                   |            | 514         |                  | 0500-0900 |
|                     |                                 | 90         | 603         | 0:19             |           |
|                     | Deploy Team 9                   |            | 604         | 0:19             |           |
|                     |                                 | 100        | 703         | 0:16             |           |
| Scout Team<br>11-12 | Deploy Team 10                  |            | 704         | 0:16             |           |
|                     |                                 | 104        | 807         | 0:42             |           |
|                     | Deploy Team 0                   |            | 808         | 0:16             |           |
|                     |                                 | 24         | 831         | 0:42             |           |
| Scout Team<br>13-14 | Deploy Team 11                  |            | 832         | 0:42             | 0800-1200 |
|                     |                                 | 100        | 931         | 0:42             |           |
|                     | Deploy Team 12                  |            | 932         | 0:42             |           |
|                     |                                 | 90         | 1021        | 0:42             |           |
| Scout Team<br>13-14 | Deploy Team 13<br>(Ft. Benning) |            | <b>1022</b> | 0:42             |           |
|                     |                                 | 90         | <b>1111</b> | 1:10             |           |
|                     | Deploy Team 14                  |            | 1112        | 1:10             |           |
|                     |                                 | 89         | 1200        | 1:30             |           |



## 7. Acknowledgments

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We particularly thank the landowners who gave us permission to conduct our study on their property, state and county officials who helped us with permissions, and several friendly people who helped us when we got our trucks stuck at various locations around the field area!

## Appendix 1: Station Information

| station ID | station ID | serial number | lat       | lon        | elevation |
|------------|------------|---------------|-----------|------------|-----------|
| R0001      | 1          | 2194          | 30.509825 | -82.832585 | 45.7      |
| R0002      | 2          | 2565          | 30.51138  | -82.834565 | 48.55     |
| R0003      | 3          | 2887          | 30.513225 | -82.836435 | 47.4      |
| R0004      | 4          | 1676          | 30.51517  | -82.83809  | 45.05     |
| R0005      | 5          | 2250          | 30.517005 | -82.8396   | 50.6      |
| R0006      | 6          | 2111          | 30.51885  | -82.841325 | 47.7      |
| R0007      | 7          | 2434          | 30.520905 | -82.84289  | 47.15     |
| R0008      | 8          | 3677          | 30.522895 | -82.84469  | 43.65     |
| R0009      | 9          | 3658          | 30.524845 | -82.8463   | 43.65     |
| R0010      | 10         | 2072          | 30.52656  | -82.84801  | 42.3      |
| R0011      | 11         | 1592          | 30.52775  | -82.85051  | 43        |
| R0012      | 12         | 1721          | 30.52814  | -82.85471  | 40.15     |
| R0013      | 13         | 1885          | 30.527885 | -82.85923  | 42.8      |
| R0014      | 14         | 2406          | 30.52768  | -82.863977 | 44.35     |
| R0015      | 15         | 2453          | 30.527915 | -82.86776  | 43.85     |
| R0016      | 16         | 3731          | 30.52864  | -82.87054  | 45        |
| R0017      | 17         | 2983          | 30.530075 | -82.873535 | 42.65     |
| R0018      | 18         | 3918          | 30.531305 | -82.8758   | 43.05     |
| R0019      | 19         | 2507          | 30.532875 | -82.87811  | 44.35     |
| R0020      | 20         | 3008          | 30.53408  | -82.880665 | 43.4      |
| R0021      | 21         | 2986          | 30.53478  | -82.88434  | 42.4      |
| R0022      | 22         | 3937          | 30.534245 | -82.88903  | 41.55     |
| R0023      | 23         | 3811          | 30.5356   | -82.891675 | 47.95     |
| R0024      | 24         | 2544          | 30.54035  | -82.889435 | 50.6      |
| R0025      | 25         | 3626          | 30.547595 | -82.88583  | 54.05     |
| R0026      | 26         | 2636          | 30.54826  | -82.88725  | 57.6      |
| R0027      | 27         | 2555          | 30.54859  | -82.890835 | 53.1      |
| R0028      | 28         | 3574          | 30.547715 | -82.8962   | 53.85     |
| R0029      | 29         | 2690          | 30.54683  | -82.90067  | 56.15     |
| R0030      | 30         | 3986          | 30.545105 | -82.906395 | 54.95     |
| R0031      | 31         | 2374          | 30.54441  | -82.91119  | 51.35     |
| R0032      | 32         | 2542          | 30.54833  | -82.911205 | 56.65     |
| R0033      | 33         | 2528          | 30.55148  | -82.91145  | 55.8      |
| R0034      | 34         | 3748          | 30.555055 | -82.91218  | 52.4      |
| R0035      | 35         | 2680          | 30.556475 | -82.914435 | 48.55     |
| R0036      | 36         | 2263          | 30.557905 | -82.916575 | 48.95     |
| R0037      | 37         | 2854          | 30.55944  | -82.918845 | 52.6      |
| R0038      | 38         | 3847          | 30.560845 | -82.92152  | 49.15     |
| R0039      | 39         | 3763          | 30.56159  | -82.92487  | 49.25     |
| R0040      | 40         | 3639          | 30.563135 | -82.92693  | 48.15     |
| R0041      | 41         | 2570          | 30.564525 | -82.92887  | 43.55     |
| R0042      | 42         | 2853          | 30.566315 | -82.93071  | 46.2      |
| R0043      | 43         | 2492          | 30.56766  | -82.932895 | 49.05     |

|       |       |          |             |            |       |
|-------|-------|----------|-------------|------------|-------|
| R0044 | 44    | 3615     | 30.56819    | -82.936475 | 51.35 |
| R0045 | 45    | 2405     | 30.56948    | -82.94002  | 54.4  |
| R0046 | 46    | 1787     | 30.572385   | -82.93996  | 55.9  |
| R0047 | 47    | 2105     | 30.57575    | -82.93932  | 60.35 |
| R0048 | 48    | 2162     | 30.577785   | -82.94073  | 48.45 |
| R0049 | 49    | 1608     | 30.579785   | -82.94214  | 49.25 |
| R0050 | 50    | 2476     | 30.582335   | -82.94317  | 52.15 |
| R0051 | 51    | 1897     | 30.58419    | -82.94372  | 46.4  |
| R0052 | 52    | 3753     | 30.58683    | -82.94506  | 54.4  |
| R0053 | 53    | 3820     | 30.591435   | -82.943375 | 55.3  |
| R0054 | 54    | 2152     | 30.596255   | -82.94045  | 48.45 |
| R0055 | 55    | 1572     | 30.59962    | -82.940925 | 54.75 |
| R0056 | 56    | 2164     | 30.60214167 | -82.9415   | 48.4  |
| R0057 | 57    | 3803     | 30.604745   | -82.941905 | 49.6  |
| R0058 | 58    | 2435     | 30.60893    | -82.939905 | 52.95 |
| R0059 | 59    | 3956     | 30.612395   | -82.93996  | 51.15 |
| R0060 | 60    | 2074     | 30.61301    | -82.94387  | 47.75 |
| R0061 | 61    | 2663     | 30.61356    | -82.9468   | 52.4  |
| R0062 | 62    | 4078     | 30.61442    | -82.949805 | 52.45 |
| R0063 | 63    | 2769     | 30.614885   | -82.953405 | 52.95 |
| R0064 | 64    | 1626     | 30.61395    | -82.959295 | 48.45 |
| R0065 | 65    | 2948     | 30.6156     | -82.961285 | 50.95 |
| R0066 | 66    | 3789     | 30.617335   | -82.962425 | 52.85 |
| R0067 | 67    | 3723     | 30.61956    | -82.964505 | 54.75 |
| R0068 | 68    | 2562     | 30.621295   | -82.96625  | 51.45 |
| R0069 | 69    | 2597     | 30.623275   | -82.967795 | 53.55 |
| R0070 | 70    | 2931     | 30.62566    | -82.968835 | 52.85 |
| R0071 | 71    | 2904     | 30.6271     | -82.971435 | 56.5  |
| R0072 | 72    | 2637     | 30.62844    | -82.973895 | 54.6  |
| R0073 | 73    | 2602     | 30.629975   | -82.97591  | 62.9  |
| R0074 | 74    | 2878     | 30.63232    | -82.977175 | 58.25 |
| R0075 | 75    | 3878     | 30.63432    | -82.977975 | 59.1  |
| R0076 | 76    | 3002     | 30.63645    | -82.97986  | 53.9  |
| R0077 | 77    | 3000     | 30.63833    | -82.981465 | 53.85 |
| R0078 | 78    | 3751     | 30.640955   | -82.98202  | 50.8  |
| R0079 | 79    | 4043     | 30.643855   | -82.98256  | 49.6  |
| R0080 | 80    | 2841     | 30.64649    | -82.982805 | 50.4  |
| R0081 | 81    | 4065     | 30.65317    | -82.978215 | 51.2  |
| R0082 | 82    | 2714     | 30.660795   | -82.9716   | 50.2  |
| R0083 | 83    | 2984     | 30.66867    | -82.965005 | 53.75 |
| R0084 | 84    | 1660     | 30.67108    | -82.96576  | 54.25 |
| R0085 | 85    | 3613     | 30.67314    | -82.967025 | 54.15 |
| R0086 | 86    | 2687     | 30.675625   | -82.967875 | 52.3  |
| F0087 | F0087 | T02_skip | 30.67842    | -82.96853  | 50    |
| R0088 | 88    | 3781     | 30.68385    | -82.965175 | 53    |
| R0089 | 89    | 3595     | 30.687005   | -82.96472  | 50.8  |
| R0090 | 90    | 2708     | 30.69072    | -82.964055 | 52.15 |
| R0091 | 91    | 2893     | 30.693345   | -82.96471  | 53.35 |

|       |     |      |             |            |       |
|-------|-----|------|-------------|------------|-------|
| R0092 | 92  | 1597 | 30.69624    | -82.96496  | 53.8  |
| R0093 | 93  | 1677 | 30.698315   | -82.96646  | 53    |
| R0094 | 94  | 3934 | 30.700845   | -82.96717  | 50.65 |
| R0095 | 95  | 3884 | 30.701185   | -82.97129  | 51.35 |
| R0096 | 96  | 1839 | 30.7015     | -82.974955 | 51    |
| R0097 | 97  | 1724 | 30.7019     | -82.979755 | 49.15 |
| R0098 | 98  | 3716 | 30.701965   | -82.98317  | 52.9  |
| R0099 | 99  | 3850 | 30.70196    | -82.987425 | 52.35 |
| R0100 | 100 | 2758 | 30.70196    | -82.991785 | 52.1  |
| R0101 | 101 | 2204 | 30.70194    | -82.996095 | 50.9  |
| R0102 | 102 | 1917 | 30.701945   | -83.000435 | 51.4  |
| R0103 | 103 | 2118 | 30.701925   | -83.004695 | 51.7  |
| R0104 | 104 | 3649 | 30.70198    | -83.009375 | 50.4  |
| R0105 | 105 | 1666 | 30.702205   | -83.012845 | 51.25 |
| R0106 | 106 | 1783 | 30.702835   | -83.01668  | 53.4  |
| R0107 | 107 | 1712 | 30.70323    | -83.020295 | 48.15 |
| R0108 | 108 | 3798 | 30.70336    | -83.02429  | 46.95 |
| R0109 | 109 | 1929 | 30.703545   | -83.028235 | 48.15 |
| R0110 | 110 | 2222 | 30.70407    | -83.03298  | 38.3  |
| R0111 | 111 | 1706 | 30.70445    | -83.03575  | 38.35 |
| R0112 | 112 | 1670 | 30.705035   | -83.039485 | 37.6  |
| R0113 | 113 | 1926 | 30.705745   | -83.043895 | 37.4  |
| R0114 | 114 | 2196 | 30.70627    | -83.047145 | 38.35 |
| R0115 | 115 | 1799 | 30.70677    | -83.050365 | 36.65 |
| R0116 | 116 | 2922 | 30.70749    | -83.053145 | 43.5  |
| R0117 | 117 | 2591 | 30.7086     | -83.055805 | 45.3  |
| R0118 | 118 | 1880 | 30.710055   | -83.05823  | 48.1  |
| R0119 | 119 | 2460 | 30.711845   | -83.060485 | 44.5  |
| R0120 | 120 | 1557 | 30.713375   | -83.06244  | 46.15 |
| R0121 | 121 | 1928 | 30.71483    | -83.06433  | 51.75 |
| R0122 | 122 | 1851 | 30.716305   | -83.066465 | 50    |
| R0123 | 123 | 2372 | 30.71815    | -83.06856  | 49    |
| R0124 | 124 | 1762 | 30.719775   | -83.07065  | 53.95 |
| R0125 | 125 | 2244 | 30.72128    | -83.072705 | 51.65 |
| R0126 | 126 | 3824 | 30.722815   | -83.07469  | 46.75 |
| R0127 | 127 | 2239 | 30.72454    | -83.07674  | 52.2  |
| R0128 | 128 | 2269 | 30.72623    | -83.07902  | 53.75 |
| R0129 | 129 | 2255 | 30.72773    | -83.080945 | 51.3  |
| R0130 | 130 | 1726 | 30.729475   | -83.08297  | 53.55 |
| R0131 | 131 | 1650 | 30.731055   | -83.085045 | 58    |
| R0132 | 132 | 2310 | 30.7326     | -83.08718  | 56.25 |
| R0133 | 133 | 2461 | 30.73432    | -83.089115 | 53.35 |
| R0134 | 134 | 1723 | 30.73591    | -83.091215 | 58.25 |
| R0135 | 135 | 2237 | 30.73754    | -83.09327  | 57.85 |
| R0136 | 136 | 3879 | 30.73914334 | -83.095355 | 51.45 |
| R0137 | 137 | 2521 | 30.740745   | -83.097345 | 54.8  |
| R0138 | 138 | 2517 | 30.74236    | -83.09945  | 55.6  |
| R0139 | 139 | 3832 | 30.743995   | -83.10155  | 57.8  |



|       |     |      |             |            |       |
|-------|-----|------|-------------|------------|-------|
| R0140 | 140 | 3720 | 30.745585   | -83.10358  | 60.7  |
| R0141 | 141 | 3644 | 30.747235   | -83.105685 | 57.8  |
| R0142 | 142 | 3940 | 30.748825   | -83.107735 | 61.45 |
| R0143 | 143 | 3622 | 30.750435   | -83.109815 | 63.35 |
| R0144 | 144 | 3913 | 30.75198    | -83.11192  | 63.15 |
| R0145 | 145 | 3638 | 30.75366    | -83.113855 | 64    |
| R0146 | 146 | 3728 | 30.755305   | -83.11596  | 57.7  |
| R0147 | 147 | 4032 | 30.788995   | -83.13162  | 56.75 |
| R0148 | 148 | 3936 | 30.758495   | -83.12007  | 61.15 |
| R0149 | 149 | 3703 | 30.76017    | -83.122125 | 53.45 |
| R0150 | 150 | 4071 | 30.761635   | -83.12415  | 60.75 |
| R0151 | 151 | 2713 | 30.763405   | -83.12628  | 49.9  |
| R0152 | 152 | 3819 | 30.76488    | -83.12861  | 49    |
| R0153 | 153 | 3916 | 30.76635    | -83.130925 | 47.9  |
| R0154 | 154 | 4003 | 30.76775    | -83.133385 | 49    |
| R0155 | 155 | 3834 | 30.768925   | -83.135785 | 46.25 |
| R0156 | 156 | 2047 | 30.770015   | -83.138425 | 51.4  |
| R0157 | 157 | 3507 | 30.771535   | -83.140905 | 54.75 |
| R0158 | 158 | 2135 | 30.77329    | -83.142725 | 54.35 |
| R0159 | 159 | 1967 | 30.775735   | -83.14352  | 57.65 |
| R0160 | 160 | 1517 | 30.779245   | -83.142975 | 56.35 |
| R0161 | 161 | 1845 | 30.78202    | -83.14342  | 55.2  |
| R0162 | 162 | 2104 | 30.78436334 | -83.144518 | 54.7  |
| R0163 | 163 | 3905 | 30.78921    | -83.142005 | 54.05 |
| R0164 | 164 | 3800 | 30.792745   | -83.14127  | 56.3  |
| R0165 | 165 | 2119 | 30.796185   | -83.140885 | 56.6  |
| R0166 | 166 | 3657 | 30.79952    | -83.14051  | 59.1  |
| R0167 | 167 | 1553 | 30.802895   | -83.140125 | 58.65 |
| R0168 | 168 | 2044 | 30.81012    | -83.134585 | 59.45 |
| R0169 | 169 | 1658 | 30.81181    | -83.136395 | 58.3  |
| R0170 | 170 | 2445 | 30.813555   | -83.13833  | 61.65 |
| R0171 | 171 | 2248 | 30.81513    | -83.1401   | 61.9  |
| R0172 | 172 | 2394 | 30.817235   | -83.14192  | 57.25 |
| R0173 | 173 | 2371 | 30.8191     | -83.143395 | 54    |
| R0174 | 174 | 1568 | 30.82106834 | -83.145165 | 54.8  |
| R0175 | 175 | 2485 | 30.822815   | -83.146845 | 58.8  |
| R0176 | 176 | 2028 | 30.825415   | -83.1476   | 57.45 |
| R0177 | 177 | 2429 | 30.82875    | -83.1473   | 58.35 |
| R0178 | 178 | 1507 | 30.82993    | -83.1503   | 58.1  |
| R0179 | 179 | 1558 | 30.82964334 | -83.155303 | 63.1  |
| R0180 | 180 | 2760 | 30.829645   | -83.15915  | 59.2  |
| R0181 | 181 | 1882 | 30.830365   | -83.162425 | 59.15 |
| R0182 | 182 | 2452 | 30.83116    | -83.165495 | 59.1  |
| R0183 | 183 | 2243 | 30.832105   | -83.168745 | 59.6  |
| R0184 | 184 | 1579 | 30.83214667 | -83.172953 | 59.4  |
| R0185 | 185 | 2184 | 30.829695   | -83.180505 | 63.8  |
| R0186 | 186 | 1829 | 30.83228    | -83.181135 | 62.9  |
| R0187 | 187 | 2456 | 30.835635   | -83.18131  | 61.9  |

|       |     |      |           |            |       |
|-------|-----|------|-----------|------------|-------|
| R0188 | 188 | 2414 | 30.838465 | -83.181215 | 69    |
| R0189 | 189 | 4086 | 30.84083  | -83.182255 | 80.4  |
| R0190 | 190 | 2364 | 30.843155 | -83.18338  | 80.75 |
| R0191 | 191 | 3859 | 30.8453   | -83.18423  | 72.75 |
| R0192 | 192 | 3701 | 30.84856  | -83.18478  | 70.1  |
| R0193 | 193 | 2607 | 30.85246  | -83.184    | 66.75 |
| R0194 | 194 | 4095 | 30.855525 | -83.183585 | 70.15 |
| R0195 | 195 | 2705 | 30.85836  | -83.183675 | 73.9  |
| R0196 | 196 | 2839 | 30.861295 | -83.18408  | 83.15 |
| R0197 | 197 | 3616 | 30.8629   | -83.186245 | 70.4  |
| R0198 | 198 | 2873 | 30.864255 | -83.188655 | 70.05 |
| R0199 | 199 | 2536 | 30.862835 | -83.19545  | 68.3  |
| R0200 | 200 | 2592 | 30.86526  | -83.195705 | 69    |
| R0201 | 201 | 3919 | 30.86618  | -83.19901  | 78.8  |
| R0202 | 202 | 2595 | 30.869045 | -83.19922  | 88.3  |
| R0203 | 203 | 1858 | 30.871795 | -83.19953  | 85.45 |
| R0204 | 204 | 2927 | 30.874135 | -83.20052  | 78.45 |
| R0205 | 205 | 2512 | 30.87594  | -83.202355 | 70.75 |
| R0206 | 206 | 2176 | 30.8773   | -83.204615 | 70.75 |
| R0207 | 207 | 2397 | 30.87899  | -83.206895 | 71.45 |
| R0208 | 208 | 2749 | 30.88097  | -83.208225 | 72.55 |
| R0209 | 209 | 2647 | 30.882805 | -83.210245 | 75.9  |
| R0210 | 210 | 3711 | 30.89226  | -83.2016   | 69.95 |
| R0211 | 211 | 2432 | 30.89584  | -83.20043  | 70.85 |
| R0212 | 212 | 2863 | 30.89822  | -83.201625 | 70.9  |
| R0213 | 213 | 3734 | 30.90064  | -83.20247  | 67.05 |
| R0214 | 214 | 3770 | 30.90335  | -83.20356  | 68.65 |
| R0215 | 215 | 1715 | 30.9056   | -83.20414  | 70.85 |
| R0216 | 216 | 3837 | 30.908065 | -83.20503  | 76.1  |
| R0217 | 217 | 3676 | 30.91062  | -83.20601  | 79.7  |
| R0218 | 218 | 3678 | 30.91355  | -83.20628  | 74.75 |
| R0219 | 219 | 3742 | 30.915465 | -83.208135 | 73.05 |
| R0220 | 220 | 3772 | 30.91576  | -83.21215  | 70.25 |
| R0221 | 221 | 3650 | 30.916115 | -83.21546  | 70.35 |
| R0222 | 222 | 1752 | 30.917155 | -83.2187   | 68.1  |
| R0223 | 223 | 3891 | 30.91747  | -83.22253  | 70.5  |
| R0224 | 224 | 1508 | 30.91856  | -83.22512  | 69.15 |
| R0225 | 225 | 3718 | 30.92032  | -83.227005 | 69.4  |
| R0226 | 226 | 4064 | 30.921595 | -83.229305 | 71.6  |
| R0227 | 227 | 2107 | 30.922725 | -83.232565 | 70.8  |
| R0228 | 228 | 2712 | 30.924925 | -83.23359  | 71.4  |
| R0229 | 229 | 2559 | 30.927175 | -83.23409  | 71.35 |
| R0230 | 230 | 1674 | 30.92969  | -83.23622  | 77.05 |
| R0231 | 231 | 2995 | 30.930675 | -83.237935 | 77.4  |
| R0232 | 232 | 1733 | 30.93227  | -83.240695 | 81.25 |
| R0233 | 233 | 3826 | 30.933205 | -83.242795 | 79.9  |
| R0234 | 234 | 1837 | 30.936635 | -83.242615 | 82.4  |
| R0235 | 235 | 3727 | 30.940735 | -83.242535 | 83.5  |

|       |     |      |             |            |       |
|-------|-----|------|-------------|------------|-------|
| R0236 | 236 | 2490 | 30.94336    | -83.2422   | 78.7  |
| R0237 | 237 | 4068 | 30.946835   | -83.24241  | 79.05 |
| R0238 | 238 | 2482 | 30.94929    | -83.24251  | 78.4  |
| R0239 | 239 | 1853 | 30.950615   | -83.24547  | 74.8  |
| R0240 | 240 | 1680 | 30.95089    | -83.249715 | 73.7  |
| R0241 | 241 | 3995 | 30.951515   | -83.25279  | 67.1  |
| R0242 | 242 | 1791 | 30.952095   | -83.25605  | 60.85 |
| R0243 | 243 | 1835 | 30.95267    | -83.264335 | 52.4  |
| R0244 | 244 | 2191 | 30.94853    | -83.265205 | 50.15 |
| R0245 | 245 | 1957 | 30.94933834 | -83.274755 | 45.15 |
| R0246 | 246 | 1956 | 30.949365   | -83.277875 | 54.2  |
| R0247 | 247 | 1848 | 30.95275    | -83.27665  | 53.45 |
| R0248 | 248 | 3894 | 30.95728    | -83.274755 | 57.85 |
| R0249 | 249 | 3997 | 30.9596     | -83.275825 | 61.15 |
| R0250 | 250 | 3722 | 30.962035   | -83.276715 | 61    |
| R0251 | 251 | 3635 | 30.96495    | -83.276755 | 64.6  |
| R0252 | 252 | 2253 | 30.968255   | -83.276575 | 66.75 |
| R0253 | 253 | 2726 | 30.971265   | -83.277005 | 67.75 |
| R0254 | 254 | 3814 | 30.973705   | -83.27787  | 67.25 |
| R0255 | 255 | 2580 | 30.976075   | -83.2788   | 66.75 |
| R0256 | 256 | 1887 | 30.97831    | -83.279965 | 67.65 |
| R0257 | 257 | 3670 | 30.980465   | -83.281175 | 67.8  |
| R0258 | 258 | 2594 | 30.98238    | -83.28309  | 64.7  |
| R0259 | 259 | 1612 | 30.983685   | -83.285145 | 63.25 |
| R0260 | 260 | 2937 | 30.985675   | -83.28723  | 63.9  |
| R0261 | 261 | 2165 | 30.987395   | -83.289215 | 66.85 |
| R0262 | 262 | 2861 | 30.9888     | -83.291245 | 64.55 |
| R0263 | 263 | 2876 | 30.991365   | -83.29199  | 56.05 |
| R0264 | 264 | 3628 | 30.994305   | -83.292085 | 55.55 |
| R0265 | 265 | 3717 | 30.99714    | -83.292675 | 56.95 |
| R0266 | 266 | 3757 | 30.99988    | -83.29328  | 53.65 |
| R0267 | 267 | 2147 | 31.00158    | -83.295025 | 51.8  |
| R0268 | 268 | 3725 | 31.003265   | -83.297185 | 49.9  |
| R0269 | 269 | 3729 | 31.004745   | -83.299185 | 52.45 |
| R0270 | 270 | 3760 | 31.00637    | -83.30136  | 60.85 |
| R0271 | 271 | 2944 | 31.00789    | -83.30352  | 60.6  |
| R0272 | 272 | 2898 | 31.00958    | -83.30542  | 58.8  |
| R0273 | 273 | 2411 | 31.011295   | -83.307105 | 62.5  |
| R0274 | 274 | 2723 | 31.013175   | -83.309195 | 59.9  |
| R0275 | 275 | 3508 | 31.011605   | -83.315555 | 66.75 |
| R0276 | 276 | 2573 | 31.011165   | -83.320515 | 76.15 |
| R0277 | 277 | 2994 | 31.01082    | -83.325055 | 72.8  |
| R0278 | 278 | 2483 | 31.0136     | -83.325645 | 73.4  |
| R0279 | 279 | 2629 | 31.01581    | -83.326495 | 72.5  |
| R0280 | 280 | 2702 | 31.017535   | -83.32873  | 76.4  |
| R0281 | 281 | 2886 | 31.01902    | -83.33084  | 73.6  |
| R0282 | 282 | 2511 | 31.02052    | -83.33293  | 73.8  |
| R0283 | 283 | 2588 | 31.022675   | -83.334365 | 65.65 |

|       |     |      |             |            |       |
|-------|-----|------|-------------|------------|-------|
| R0284 | 284 | 2763 | 31.025015   | -83.33575  | 64.2  |
| R0285 | 285 | 2831 | 31.02707    | -83.337187 | 76.9  |
| R0286 | 286 | 2264 | 31.02865    | -83.338865 | 77.1  |
| R0287 | 287 | 2527 | 31.030415   | -83.34081  | 72.9  |
| R0288 | 288 | 2632 | 31.03228    | -83.342595 | 71    |
| R0289 | 289 | 2812 | 31.034675   | -83.34356  | 71.1  |
| R0290 | 290 | 3764 | 31.037655   | -83.344705 | 70.2  |
| R0291 | 291 | 2638 | 31.03964    | -83.34548  | 70.15 |
| R0292 | 292 | 4039 | 31.04173    | -83.346775 | 70.1  |
| R0293 | 293 | 2516 | 31.043605   | -83.34881  | 71.3  |
| R0294 | 294 | 2851 | 31.045605   | -83.350095 | 75    |
| R0295 | 295 | 2664 | 31.047595   | -83.351195 | 77.8  |
| R0296 | 296 | 2465 | 31.0501     | -83.352415 | 77.8  |
| R0297 | 297 | 2148 | 31.0537     | -83.351805 | 65.4  |
| R0298 | 298 | 1614 | 31.05783    | -83.35048  | 71.95 |
| R0299 | 299 | 1671 | 31.06217    | -83.34964  | 75.15 |
| R0300 | 300 | 2431 | 31.06388    | -83.350495 | 77.6  |
| R0301 | 301 | 2099 | 31.06626    | -83.351685 | 75.1  |
| R0302 | 302 | 1700 | 31.068035   | -83.353695 | 73.25 |
| R0303 | 303 | 1518 | 31.069215   | -83.35613  | 75.55 |
| R0304 | 304 | 2036 | 31.070535   | -83.358575 | 79    |
| R0305 | 305 | 1959 | 31.072475   | -83.36063  | 77.95 |
| R0306 | 306 | 1820 | 31.07422    | -83.3622   | 79.7  |
| R0307 | 307 | 2495 | 31.0764     | -83.363635 | 79    |
| R0308 | 308 | 2034 | 31.078405   | -83.36496  | 77.75 |
| R0309 | 309 | 1789 | 31.08013    | -83.367085 | 78.1  |
| R0310 | 310 | 2870 | 31.081435   | -83.369485 | 75.95 |
| R0311 | 311 | 1815 | 31.08301    | -83.371625 | 77.85 |
| R0312 | 312 | 1703 | 31.084815   | -83.373095 | 76.25 |
| R0313 | 313 | 1912 | 31.086785   | -83.37476  | 75.85 |
| R0314 | 314 | 1938 | 31.08822    | -83.37724  | 74.35 |
| R0315 | 315 | 1741 | 31.089125   | -83.380225 | 72.55 |
| R0316 | 316 | 1921 | 31.090735   | -83.382385 | 75    |
| R0317 | 317 | 1813 | 31.092875   | -83.38382  | 70.2  |
| R0318 | 318 | 1701 | 31.094825   | -83.385165 | 75.55 |
| R0319 | 319 | 1866 | 31.0968     | -83.38692  | 72.15 |
| R0320 | 320 | 1607 | 31.09849    | -83.3888   | 75.15 |
| R0321 | 321 | 1512 | 31.10038    | -83.390935 | 76.7  |
| R0322 | 322 | 1615 | 31.101835   | -83.392965 | 78.2  |
| R0323 | 323 | 1998 | 31.103205   | -83.395055 | 77.05 |
| R0324 | 324 | 2649 | 31.10491    | -83.397155 | 76.25 |
| R0325 | 325 | 3909 | 31.10681    | -83.39922  | 76.5  |
| R0326 | 326 | 2574 | 31.10871    | -83.40158  | 79.15 |
| R0327 | 327 | 2554 | 31.10981    | -83.4031   | 78.05 |
| R0328 | 328 | 2658 | 31.112405   | -83.40389  | 78.5  |
| R0329 | 329 | 3625 | 31.11312    | -83.407215 | 77.3  |
| R0330 | 330 | 2916 | 31.11372334 | -83.410763 | 78.3  |
| R0331 | 331 | 3788 | 31.114665   | -83.413785 | 78.65 |



|       |     |      |           |            |       |
|-------|-----|------|-----------|------------|-------|
| R0332 | 332 | 2605 | 31.11706  | -83.414845 | 79.35 |
| R0333 | 333 | 1862 | 31.11955  | -83.415287 | 76.9  |
| R0334 | 334 | 2538 | 31.12056  | -83.41954  | 78    |
| R0335 | 335 | 2717 | 31.12004  | -83.41899  | 78.9  |
| R0336 | 336 | 1903 | 31.120625 | -83.42688  | 75.65 |
| R0337 | 337 | 2599 | 31.12096  | -83.43026  | 75.1  |
| R0338 | 338 | 2728 | 31.1215   | -83.435655 | 78.7  |
| R0339 | 339 | 2747 | 31.122025 | -83.438125 | 80.35 |
| R0340 | 340 | 3629 | 31.12546  | -83.436445 | 77.15 |
| R0341 | 341 | 2108 | 31.12757  | -83.43877  | 76.2  |
| R0342 | 342 | 1757 | 31.129095 | -83.440575 | 74.7  |
| R0343 | 343 | 2525 | 31.13143  | -83.441795 | 78.95 |
| R0344 | 344 | 2670 | 31.13472  | -83.44103  | 83.3  |
| R0345 | 345 | 3596 | 31.13557  | -83.44479  | 78.85 |
| R0346 | 346 | 2051 | 31.13768  | -83.44578  | 79.65 |
| R0347 | 347 | 1827 | 31.14022  | -83.44666  | 80.25 |
| R0348 | 348 | 2384 | 31.141645 | -83.44944  | 78.8  |
| R0349 | 349 | 1759 | 31.1428   | -83.451585 | 77.85 |
| R0350 | 350 | 1997 | 31.14421  | -83.454185 | 79.7  |
| R0351 | 351 | 1756 | 31.14572  | -83.45698  | 80.35 |
| R0352 | 352 | 1656 | 31.146995 | -83.459525 | 79.35 |
| R0353 | 353 | 2101 | 31.14808  | -83.46277  | 78.15 |
| R0354 | 354 | 2946 | 31.1531   | -83.45958  | 79.85 |
| R0355 | 355 | 2627 | 31.157355 | -83.458135 | 79.75 |
| R0356 | 356 | 1889 | 31.165445 | -83.45072  | 81.95 |
| R0357 | 357 | 3637 | 31.168065 | -83.45168  | 77.95 |
| R0358 | 358 | 2390 | 31.17019  | -83.45368  | 79.6  |
| R0359 | 359 | 1818 | 31.17201  | -83.455085 | 81    |
| R0360 | 360 | 1883 | 31.173755 | -83.45673  | 81.45 |
| R0361 | 361 | 1678 | 31.17543  | -83.45894  | 83.05 |
| R0362 | 362 | 1581 | 31.17652  | -83.46176  | 82.2  |
| R0363 | 363 | 2094 | 31.17752  | -83.46473  | 83.5  |
| R0364 | 364 | 2170 | 31.17799  | -83.468535 | 82.2  |
| R0365 | 365 | 2112 | 31.179175 | -83.471265 | 82    |
| R0366 | 366 | 2918 | 31.180065 | -83.47464  | 81.75 |
| R0367 | 367 | 2666 | 31.180575 | -83.47801  | 82.95 |
| R0368 | 368 | 3609 | 31.180735 | -83.481855 | 80.9  |
| R0369 | 369 | 1637 | 31.18151  | -83.485185 | 80.9  |
| R0370 | 370 | 3706 | 31.18284  | -83.48781  | 86.25 |
| R0371 | 371 | 1875 | 31.18414  | -83.49021  | 84.4  |
| R0372 | 372 | 3643 | 31.187295 | -83.48981  | 82.2  |
| R0373 | 373 | 2727 | 31.1911   | -83.48888  | 83.55 |
| R0374 | 374 | 3857 | 31.19495  | -83.487705 | 81.85 |
| R0375 | 375 | 2515 | 31.197795 | -83.488455 | 85.15 |
| R0376 | 376 | 4075 | 31.19978  | -83.49048  | 82.8  |
| R0377 | 377 | 2069 | 31.202155 | -83.49139  | 81.45 |
| R0378 | 378 | 4036 | 31.205295 | -83.49111  | 75.8  |
| R0379 | 379 | 2915 | 31.20845  | -83.49085  | 83.2  |

|       |     |      |             |            |       |
|-------|-----|------|-------------|------------|-------|
| R0380 | 380 | 3808 | 31.212095   | -83.49031  | 81.9  |
| R0381 | 381 | 3928 | 31.21542    | -83.48976  | 85.25 |
| R0382 | 382 | 1632 | 31.21885    | -83.48918  | 81.65 |
| R0383 | 383 | 2523 | 31.227065   | -83.48178  | 87.2  |
| R0384 | 384 | 3827 | 31.22788    | -83.48527  | 79.4  |
| R0385 | 385 | 3612 | 31.22954    | -83.487445 | 76.8  |
| R0386 | 386 | 3586 | 31.231885   | -83.48874  | 78.7  |
| R0387 | 387 | 3777 | 31.233825   | -83.49052  | 80.4  |
| R0388 | 388 | 4049 | 31.235715   | -83.4923   | 81.1  |
| R0389 | 389 | 3726 | 31.23748    | -83.49404  | 77    |
| R0390 | 390 | 1690 | 31.23924    | -83.495615 | 75.8  |
| R0391 | 391 | 1765 | 31.241065   | -83.49722  | 82.3  |
| R0392 | 392 | 2150 | 31.243585   | -83.498545 | 77.6  |
| R0393 | 393 | 2233 | 31.24539    | -83.499455 | 76.75 |
| R0394 | 394 | 3935 | 31.24798    | -83.50093  | 75.6  |
| R0395 | 395 | 1767 | 31.24947    | -83.5028   | 71.45 |
| R0396 | 396 | 3592 | 31.25129    | -83.504735 | 69.8  |
| R0397 | 397 | 3746 | 31.253185   | -83.505997 | 75.85 |
| R0398 | 398 | 3713 | 31.25418    | -83.50885  | 73.45 |
| R0399 | 399 | 3710 | 31.25483    | -83.5119   | 67.85 |
| R0400 | 400 | 2102 | 31.25511    | -83.51596  | 69.75 |
| R0401 | 401 | 2530 | 31.255665   | -83.519505 | 81.65 |
| R0402 | 402 | 1601 | 31.25635    | -83.523235 | 79.75 |
| R0403 | 403 | 1795 | 31.25699    | -83.52646  | 78.65 |
| R0404 | 404 | 1922 | 31.25741    | -83.530035 | 77.4  |
| R0405 | 405 | 1708 | 31.257295   | -83.5348   | 79.05 |
| R0406 | 406 | 2247 | 31.257145   | -83.539715 | 82.4  |
| R0407 | 407 | 1675 | 31.257205   | -83.544235 | 79.6  |
| R0408 | 408 | 1634 | 31.25732    | -83.548025 | 82.95 |
| R0409 | 409 | 1911 | 31.257505   | -83.55232  | 85.45 |
| R0410 | 410 | 1918 | 31.258155   | -83.555785 | 86.85 |
| R0411 | 411 | 1664 | 31.2591     | -83.55899  | 83.85 |
| R0412 | 412 | 2882 | 31.26027    | -83.561915 | 90.4  |
| R0413 | 413 | 1881 | 31.26158    | -83.56389  | 90.4  |
| R0414 | 414 | 1943 | 31.26338    | -83.56622  | 88.4  |
| R0415 | 415 | 2186 | 31.26474    | -83.56795  | 81.75 |
| R0416 | 416 | 2754 | 31.26662667 | -83.570127 | 86.1  |
| R0417 | 417 | 3709 | 31.2678     | -83.572615 | 84.35 |
| R0418 | 418 | 2648 | 31.268845   | -83.57553  | 87.7  |
| R0419 | 419 | 2234 | 31.2701     | -83.578455 | 86.85 |
| R0420 | 420 | 3646 | 31.270485   | -83.58176  | 78.6  |
| R0421 | 421 | 1610 | 31.26792    | -83.59005  | 87.45 |
| R0422 | 422 | 1772 | 31.268875   | -83.59302  | 88.3  |
| R0423 | 423 | 2741 | 31.26993    | -83.596065 | 88.85 |
| R0424 | 424 | 2621 | 31.27086    | -83.599105 | 88.4  |
| R0425 | 425 | 3641 | 31.271975   | -83.601785 | 92.7  |
| R0426 | 426 | 2756 | 31.27296834 | -83.604318 | 86.95 |
| R0427 | 427 | 2807 | 31.2742     | -83.60715  | 95.45 |

|       |     |      |           |            |        |
|-------|-----|------|-----------|------------|--------|
| R0428 | 428 | 2697 | 31.275285 | -83.609755 | 97.25  |
| R0429 | 429 | 2676 | 31.27637  | -83.6122   | 91.5   |
| R0430 | 430 | 2857 | 31.27794  | -83.614905 | 85.75  |
| R0431 | 431 | 2797 | 31.27902  | -83.61726  | 91.25  |
| R0432 | 432 | 3843 | 31.280325 | -83.619765 | 88.15  |
| R0433 | 433 | 3708 | 31.282045 | -83.621875 | 88.85  |
| R0434 | 434 | 2604 | 31.28388  | -83.623635 | 94.25  |
| R0435 | 435 | 2526 | 31.2857   | -83.625335 | 99.4   |
| R0436 | 436 | 3671 | 31.287645 | -83.62719  | 99.2   |
| R0437 | 437 | 2735 | 31.28958  | -83.62884  | 95.6   |
| R0438 | 438 | 2088 | 31.291695 | -83.63015  | 98.2   |
| R0439 | 439 | 3712 | 31.29344  | -83.631735 | 98.35  |
| R0440 | 440 | 2901 | 31.295335 | -83.63402  | 100    |
| R0441 | 441 | 3669 | 31.296895 | -83.63556  | 100    |
| R0442 | 442 | 2688 | 31.29893  | -83.63726  | 102.95 |
| R0443 | 443 | 2501 | 31.30067  | -83.638985 | 99.1   |
| R0444 | 444 | 2924 | 31.302275 | -83.640895 | 91.15  |
| R0445 | 445 | 2900 | 31.30418  | -83.642505 | 88.65  |
| R0446 | 446 | 2921 | 31.307435 | -83.64223  | 94.7   |
| R0447 | 447 | 2398 | 31.31056  | -83.64235  | 95.45  |
| R0448 | 448 | 2990 | 31.313495 | -83.64223  | 96.65  |
| R0449 | 449 | 2692 | 31.31568  | -83.643655 | 97.1   |
| R0450 | 450 | 1611 | 31.31756  | -83.645435 | 98.15  |
| R0451 | 451 | 2935 | 31.319365 | -83.647305 | 94.1   |
| R0452 | 452 | 2980 | 31.32115  | -83.64896  | 95.8   |
| R0453 | 453 | 4059 | 31.32292  | -83.6507   | 97.45  |
| R0454 | 454 | 2719 | 31.324485 | -83.65249  | 95.6   |
| R0455 | 455 | 2867 | 31.32702  | -83.654235 | 99.15  |
| R0456 | 456 | 2168 | 31.32999  | -83.653965 | 99.25  |
| R0457 | 457 | 2130 | 31.332735 | -83.654195 | 101.15 |
| R0458 | 458 | 2811 | 31.335225 | -83.65516  | 100.65 |
| R0459 | 459 | 2755 | 31.33709  | -83.65667  | 97.7   |
| R0460 | 460 | NONE | 31.33933  | -83.658205 | 104.3  |
| R0461 | 461 | NONE | 31.34127  | -83.659655 | 106.5  |
| R0462 | 462 | 2801 | 31.343215 | -83.66108  | 103.65 |
| R0463 | 463 | 3970 | 31.34562  | -83.66274  | 102    |
| R0464 | 464 | 2646 | 31.347425 | -83.664285 | 109.6  |
| R0465 | 465 | 2457 | 31.34959  | -83.665515 | 106.4  |
| R0466 | 466 | 2610 | 31.351615 | -83.666945 | 109.15 |
| R0467 | 467 | 1994 | 31.35337  | -83.668355 | 103.75 |
| R0468 | 468 | 2832 | 31.35559  | -83.669875 | 105.55 |
| R0469 | 469 | 3773 | 31.35768  | -83.67114  | 110.2  |
| R0470 | 470 | 2837 | 31.35989  | -83.672645 | 110.8  |
| R0471 | 471 | 2880 | 31.3618   | -83.67426  | 107.05 |
| R0472 | 472 | 2835 | 31.363625 | -83.676125 | 105.5  |
| R0473 | 473 | 3740 | 31.365425 | -83.67816  | 108.45 |
| R0474 | 474 | 3673 | 31.366975 | -83.67986  | 106.65 |
| R0475 | 475 | 2808 | 31.36889  | -83.68175  | 106.75 |

|       |     |      |           |            |        |
|-------|-----|------|-----------|------------|--------|
| R0476 | 476 | 3906 | 31.370905 | -83.68286  | 103.95 |
| R0477 | 477 | 2836 | 31.374205 | -83.684765 | 101.3  |
| R0478 | 478 | 2843 | 31.375645 | -83.685505 | 105.1  |
| R0479 | 479 | 2624 | 31.377955 | -83.686635 | 108.7  |
| R0480 | 480 | 2581 | 31.38017  | -83.688365 | 115.25 |
| R0481 | 481 | 2612 | 31.381915 | -83.689685 | 114    |
| R0482 | 482 | 3741 | 31.38364  | -83.69123  | 116.5  |
| R0483 | 483 | 3881 | 31.38601  | -83.693535 | 114.45 |
| R0484 | 484 | 2858 | 31.388225 | -83.69461  | 117.7  |
| R0485 | 485 | 2991 | 31.390185 | -83.695685 | 116.85 |
| R0486 | 486 | 1830 | 31.39237  | -83.69689  | 117.3  |
| R0487 | 487 | 2641 | 31.39494  | -83.698265 | 116.35 |
| R0488 | 488 | 2412 | 31.396815 | -83.699905 | 118.5  |
| R0489 | 489 | 2872 | 31.398985 | -83.701355 | 118.25 |
| R0490 | 490 | 3600 | 31.400715 | -83.702875 | 113.6  |
| R0491 | 491 | 2626 | 31.402915 | -83.70444  | 112.45 |
| R0492 | 492 | 2987 | 31.40512  | -83.706    | 115.8  |
| R0493 | 493 | 3977 | 31.40697  | -83.707565 | 116.5  |
| R0494 | 494 | 2998 | 31.40903  | -83.709185 | 119.3  |
| R0495 | 495 | 2847 | 31.41085  | -83.71103  | 117.35 |
| R0496 | 496 | 4013 | 31.4129   | -83.712675 | 110.05 |
| R0497 | 497 | 3730 | 31.41453  | -83.71406  | 105.7  |
| R0498 | 498 | 2919 | 31.41641  | -83.71549  | 109.6  |
| R0499 | 499 | 3700 | 31.418575 | -83.717115 | 117.1  |
| R0500 | 500 | 3606 | 31.419965 | -83.719385 | 109.6  |
| R0501 | 501 | 2392 | 31.421225 | -83.72187  | 108.85 |
| R0502 | 502 | 1603 | 31.422695 | -83.724465 | 107.8  |
| R0503 | 503 | 1713 | 31.423875 | -83.72694  | 102.7  |
| R0504 | 504 | 2524 | 31.424935 | -83.72991  | 109.6  |
| R0505 | 505 | 1627 | 31.42592  | -83.73275  | 111.3  |
| R0506 | 506 | 2911 | 31.42703  | -83.735665 | 114.95 |
| R0507 | 507 | 2227 | 31.428405 | -83.738295 | 119.15 |
| R0508 | 508 | 2129 | 31.429705 | -83.74072  | 118.3  |
| R0509 | 509 | 1699 | 31.431085 | -83.74295  | 125.3  |
| R0510 | 510 | 2463 | 31.432045 | -83.746105 | 118.85 |
| R0511 | 511 | 1838 | 31.43304  | -83.748765 | 119.25 |
| R0512 | 512 | 1645 | 31.433945 | -83.751905 | 115.25 |
| R0513 | 513 | 2615 | 31.43478  | -83.75528  | 112.8  |
| R0514 | 514 | 2117 | 31.43601  | -83.757625 | 107.4  |
| R0515 | 515 | 1591 | 31.43747  | -83.75993  | 101.8  |
| R0516 | 516 | 2685 | 31.439265 | -83.761935 | 105.7  |
| R0517 | 517 | 1704 | 31.441205 | -83.76349  | 106.45 |
| R0518 | 518 | 4061 | 31.442955 | -83.76512  | 109.55 |
| R0519 | 519 | 2451 | 31.444845 | -83.76689  | 111.5  |
| R0520 | 520 | 1981 | 31.446765 | -83.768665 | 114.35 |
| R0521 | 521 | 1754 | 31.449065 | -83.76993  | 116.8  |
| R0522 | 522 | 3963 | 31.451475 | -83.771015 | 115.6  |
| R0523 | 523 | 1587 | 31.45345  | -83.77198  | 118.15 |

|       |     |      |             |            |        |
|-------|-----|------|-------------|------------|--------|
| R0524 | 524 | 1826 | 31.45605    | -83.773175 | 117.45 |
| R0525 | 525 | 3987 | 31.458755   | -83.774025 | 122.55 |
| R0526 | 526 | 1742 | 31.460965   | -83.774895 | 121.05 |
| R0527 | 527 | 1685 | 31.463615   | -83.775715 | 123    |
| R0528 | 528 | 1966 | 31.46601    | -83.776495 | 115.8  |
| R0529 | 529 | 3664 | 31.46811    | -83.77826  | 119.7  |
| R0530 | 530 | 2473 | 31.469365   | -83.780555 | 118.6  |
| R0531 | 531 | 4073 | 31.47095    | -83.78271  | 113.8  |
| R0532 | 532 | 3797 | 31.473215   | -83.78387  | 107.35 |
| R0533 | 533 | 2235 | 31.476075   | -83.784425 | 111.4  |
| R0534 | 534 | 3849 | 31.478325   | -83.785265 | 107.6  |
| R0535 | 535 | 1669 | 31.48064    | -83.7867   | 107.5  |
| R0536 | 536 | 2006 | 31.48242    | -83.78829  | 109.6  |
| R0537 | 537 | 3571 | 31.484465   | -83.789755 | 113.1  |
| R0538 | 538 | 2116 | 31.486505   | -83.790905 | 119.15 |
| R0539 | 539 | 1693 | 31.488985   | -83.79215  | 123.75 |
| R0540 | 540 | 2470 | 31.490755   | -83.793975 | 115.7  |
| R0541 | 541 | 3608 | 31.49266    | -83.795835 | 117.2  |
| R0542 | 542 | 1790 | 31.494565   | -83.79707  | 123.9  |
| R0543 | 543 | 1695 | 31.49717    | -83.79789  | 121.9  |
| R0544 | 544 | 2930 | 31.5        | -83.79864  | 126.25 |
| R0545 | 545 | 4082 | 31.50239    | -83.79951  | 125.8  |
| R0546 | 546 | 2122 | 31.50478    | -83.800505 | 121.05 |
| R0547 | 547 | 2665 | 31.506345   | -83.802905 | 120.05 |
| R0548 | 548 | 2875 | 31.507665   | -83.805115 | 121.45 |
| R0549 | 549 | 2694 | 31.50889    | -83.807675 | 111.15 |
| R0550 | 550 | 3867 | 31.51037    | -83.809735 | 112.55 |
| R0551 | 551 | 1863 | 31.51209    | -83.8121   | 118.5  |
| R0552 | 552 | 2997 | 31.51442    | -83.812585 | 128.6  |
| R0553 | 553 | 2932 | 31.517825   | -83.81253  | 119.9  |
| R0554 | 554 | 2593 | 31.521305   | -83.81241  | 122.8  |
| R0555 | 555 | 2803 | 31.524195   | -83.81244  | 124.15 |
| R0556 | 556 | 3750 | 31.527115   | -83.812355 | 123.85 |
| R0557 | 557 | 3920 | 31.527145   | -83.815825 | 129.35 |
| R0558 | 558 | 1663 | 31.52978834 | -83.817297 | 136.55 |
| R0559 | 559 | 1905 | 31.53213167 | -83.817898 | 130.3  |
| R0560 | 560 | 2132 | 31.53213667 | -83.822653 | 130.15 |
| R0561 | 561 | 2261 | 31.53456    | -83.822735 | 130.05 |
| R0562 | 562 | 1831 | 31.53683333 | -83.824867 | 129.4  |
| R0563 | 563 | 1552 | 31.538445   | -83.827968 | 133.45 |
| R0564 | 564 | 1689 | 31.53970334 | -83.829185 | 131.1  |
| R0565 | 565 | 1805 | 31.54200167 | -83.830688 | 139.15 |
| R0566 | 566 | 1792 | 31.54487667 | -83.83066  | 133    |
| R0567 | 567 | 2493 | 31.54841167 | -83.830678 | 128.6  |
| R0568 | 568 | 1737 | 31.55068667 | -83.830913 | 131.3  |
| R0569 | 569 | 2238 | 31.55091334 | -83.835947 | 133.4  |
| R0570 | 570 | 2071 | 31.5508     | -83.840663 | 134.2  |
| R0571 | 571 | 2180 | 31.55104334 | -83.842733 | 132.95 |

|       |     |      |             |             |        |
|-------|-----|------|-------------|-------------|--------|
| R0572 | 572 | 2472 | 31.55447667 | -83.84346   | 135.2  |
| R0573 | 573 | 2093 | 31.55657334 | -83.845397  | 136.65 |
| R0574 | 574 | 4021 | 31.55818167 | -83.847327  | 134.45 |
| R0575 | 575 | 1780 | 31.56017    | -83.848975  | 135.65 |
| R0576 | 576 | 2016 | 31.56246334 | -83.850232  | 138.85 |
| R0577 | 577 | 4056 | 31.56446834 | -83.85171   | 131.4  |
| R0578 | 578 | 1641 | 31.56651667 | -83.853233  | 134.2  |
| R0579 | 579 | 1951 | 31.56893167 | -83.854123  | 136.6  |
| R0580 | 580 | 1877 | 31.57194    | -83.853955  | 135.6  |
| R0581 | 581 | 4028 | 31.57458667 | -83.854613  | 137.8  |
| R0582 | 582 | 1971 | 31.57723667 | -83.855177  | 133    |
| R0583 | 583 | 4045 | 31.57963667 | -83.856677  | 129.75 |
| R0584 | 584 | 2582 | 31.58156    | -83.857872  | 131.45 |
| R0585 | 585 | 4041 | 31.583455   | -83.85954   | 130.5  |
| R0586 | 586 | 1598 | 31.58566    | -83.860627  | 128.6  |
| R0587 | 587 | 1526 | 31.58794334 | -83.861918  | 130.65 |
| R0588 | 588 | 3989 | 31.59026334 | -83.863037  | 128.55 |
| R0589 | 589 | 2154 | 31.59285    | -83.863718  | 122.75 |
| R0590 | 590 | 3667 | 31.59516667 | -83.864888  | 118.2  |
| R0591 | 591 | 2899 | 31.596805   | -83.866938  | 112.45 |
| R0592 | 592 | 3775 | 31.59869    | -83.868655  | 112.65 |
| R0593 | 593 | 2219 | 31.60046167 | -83.870582  | 117.95 |
| R0594 | 594 | 1662 | 31.60225    | -83.87255   | 53.25  |
| R0595 | 595 | 2245 | 31.60381834 | -83.874798  | 108.1  |
| R0596 | 596 | 1865 | 31.605295   | -83.876782  | 105.05 |
| R0597 | 597 | 1872 | 31.60681834 | -83.87901   | 102.6  |
| R0598 | 598 | 1503 | 31.60818667 | -83.881287  | 98.7   |
| R0599 | 599 | 1785 | 31.60983834 | -83.8835483 | 96.25  |
| R0600 | 600 | 2484 | 31.61145334 | -83.885865  | 96.8   |
| R0601 | 601 | 2428 | 31.61296167 | -83.887787  | 99.25  |
| R0602 | 602 | 1840 | 31.614825   | -83.889822  | 95.85  |
| R0603 | 603 | 2424 | 31.61637    | -83.89194   | 98.6   |
| R0604 | 604 | 3758 | 31.617685   | -83.894165  | 97.2   |
| R0605 | 605 | 2596 | 31.618925   | -83.89625   | 96.45  |
| R0606 | 606 | 2549 | 31.62058    | -83.89879   | 97.2   |
| R0607 | 607 | 3980 | 31.621825   | -83.901575  | 94.1   |
| R0608 | 608 | 4080 | 31.624355   | -83.906045  | 92.45  |
| R0609 | 609 | 3897 | 31.62434    | -83.90744   | 92.25  |
| R0610 | 610 | 2616 | 31.624415   | -83.91104   | 92.95  |
| R0611 | 611 | 2729 | 31.624445   | -83.91536   | 96.1   |
| R0612 | 612 | 2879 | 31.62446    | -83.919435  | 90.9   |
| R0613 | 613 | 2874 | 31.624545   | -83.92399   | 92.9   |
| R0614 | 614 | 3972 | 31.62457    | -83.9281    | 92.95  |
| R0615 | 615 | 3812 | 31.62459    | -83.932415  | 83.2   |
| R0616 | 616 | 2740 | 31.62466    | -83.93684   | 83.35  |
| R0617 | 617 | 3695 | 31.62468    | -83.941015  | 90.7   |
| R0618 | 618 | 2631 | 31.62478    | -83.94501   | 89.7   |
| R0619 | 619 | 1876 | 31.627535   | -83.94532   | 84.5   |



|       |     |          |           |            |       |
|-------|-----|----------|-----------|------------|-------|
| R0620 | 620 | 1642     | 31.63077  | -83.94526  | 88.45 |
| R0621 | 621 | 1834     | 31.633625 | -83.945225 | 88.05 |
| R0622 | 622 | 3704     | 31.637105 | -83.94519  | 88.5  |
| R0623 | 623 | 3851     | 31.640335 | -83.945135 | 84.8  |
| R0624 | 624 | 1894     | 31.64335  | -83.9451   | 90.6  |
| R0625 | 625 | 3993     | 31.646535 | -83.945005 | 91.05 |
| R0626 | 626 | 2262     | 31.64968  | -83.944965 | 90.55 |
| R0627 | 627 | 2267     | 31.652455 | -83.94494  | 88    |
| R0628 | 628 | 2011     | 31.654995 | -83.94501  | 97.3  |
| R0629 | 629 | 1859     | 31.65726  | -83.946915 | 87.15 |
| R0630 | 630 | 3877     | 31.657715 | -83.950415 | 80.1  |
| R0631 | 631 | 2175     | 31.657775 | -83.9545   | 81    |
| R0632 | 632 | 2462     | 31.657825 | -83.959595 | 84.2  |
| R0633 | 633 | 1722     | 31.66109  | -83.95962  | 83.55 |
| R0634 | 634 | 2674     | 31.6642   | -83.959645 | 79.15 |
| R0635 | 635 | 1691     | 31.667025 | -83.959765 | 76.35 |
| R0636 | 636 | 1668     | 31.66961  | -83.96087  | 82    |
| R0637 | 637 | 2850     | 31.67134  | -83.9623   | 74    |
| R0638 | 638 | 2579     | 31.67324  | -83.96393  | 82.3  |
| R0639 | 639 | 2696     | 31.676595 | -83.96392  | 79.55 |
| R0640 | 640 | 1982     | 31.679535 | -83.963935 | 85.2  |
| R0641 | 641 | T09_skip | 31.68279  | -83.96384  | 80.9  |
| R0642 | 642 | 3682     | 31.685765 | -83.963845 | 83.45 |
| R0643 | 643 | 2661     | 31.68905  | -83.96385  | 86.85 |
| R0644 | 644 | 2938     | 31.69189  | -83.96384  | 86.45 |
| R0645 | 645 | 3983     | 31.6947   | -83.96388  | 87.1  |
| R0646 | 646 | 3766     | 31.69633  | -83.96638  | 86.75 |
| R0647 | 647 | 2652     | 31.69724  | -83.970015 | 77.8  |
| R0648 | 648 | 3602     | 31.6982   | -83.972635 | 84.8  |
| R0649 | 649 | 2989     | 31.70107  | -83.97318  | 79.9  |
| R0650 | 650 | 3924     | 31.704585 | -83.973145 | 84.85 |
| R0651 | 651 | 3871     | 31.70646  | -83.974165 | 84.2  |
| R0652 | 652 | 3961     | 31.70701  | -83.97779  | 82    |
| R0653 | 653 | 4026     | 31.707045 | -83.98291  | 80.2  |
| R0654 | 654 | 4088     | 31.707085 | -83.98629  | 82.1  |
| R0655 | 655 | 3854     | 31.707455 | -83.98998  | 83.25 |
| R0656 | 656 | 4090     | 31.71093  | -83.989425 | 85.55 |
| R0657 | 657 | 4055     | 31.714265 | -83.988895 | 82.8  |
| R0658 | 658 | 4094     | 31.717855 | -83.988365 | 73.5  |
| R0659 | 659 | 3930     | 31.72146  | -83.987765 | 80.4  |
| R0660 | 660 | 2537     | 31.724905 | -83.987225 | 80.65 |
| R0661 | 661 | 3971     | 31.72605  | -83.99013  | 83.3  |
| R0662 | 662 | 3991     | 31.72556  | -83.995145 | 82.7  |
| R0663 | 663 | 3862     | 31.72498  | -84.000995 | 82.8  |
| R0664 | 664 | 3620     | 31.724635 | -84.00505  | 90.1  |
| R0665 | 665 | 3663     | 31.72483  | -84.00948  | 86.75 |
| R0666 | 666 | 2550     | 31.724995 | -84.013215 | 81.45 |
| R0667 | 667 | 3769     | 31.725225 | -84.01697  | 72.15 |

|       |     |      |           |            |       |
|-------|-----|------|-----------|------------|-------|
| R0668 | 668 | 2881 | 31.725395 | -84.021155 | 73.05 |
| R0669 | 669 | 3715 | 31.725545 | -84.02488  | 72.55 |
| R0670 | 670 | 3768 | 31.72588  | -84.03126  | 78.45 |
| R0671 | 671 | 3759 | 31.72589  | -84.03114  | 79.1  |
| R0672 | 672 | 3844 | 31.726125 | -84.036455 | 80.15 |
| R0673 | 673 | 2572 | 31.72634  | -84.04089  | 85.1  |
| R0674 | 674 | 1811 | 31.72652  | -84.04477  | 84.65 |
| R0675 | 675 | 3779 | 31.726785 | -84.0482   | 86.9  |
| R0676 | 676 | 2229 | 31.727085 | -84.052745 | 89.45 |
| R0677 | 677 | 1619 | 31.72753  | -84.056955 | 89.5  |
| R0678 | 678 | 2895 | 31.72836  | -84.05931  | 90.65 |
| R0679 | 679 | 2254 | 31.72927  | -84.063775 | 90.8  |
| R0680 | 680 | 1556 | 31.73203  | -84.064255 | 89.7  |
| R0681 | 681 | 2141 | 31.73663  | -84.062805 | 96.7  |
| R0682 | 682 | 2433 | 31.73937  | -84.062485 | 93.7  |
| R0683 | 683 | 1924 | 31.74178  | -84.06354  | 89.3  |
| R0684 | 684 | 1976 | 31.74404  | -84.064775 | 94.2  |
| R0685 | 685 | 2620 | 31.746835 | -84.06491  | 96.05 |
| R0686 | 686 | 2681 | 31.750045 | -84.065025 | 96.15 |
| R0687 | 687 | 1630 | 31.75315  | -84.06516  | 89.05 |
| R0688 | 688 | 1561 | 31.75609  | -84.06527  | 91.65 |
| R0689 | 689 | 2499 | 31.757565 | -84.067545 | 88.05 |
| R0690 | 690 | 3683 | 31.760175 | -84.0684   | 88.15 |
| R0691 | 691 | 3852 | 31.762665 | -84.069245 | 88.45 |
| R0692 | 692 | 2652 | 31.76597  | -84.070215 | 88.8  |
| R0693 | 693 | 3597 | 31.76772  | -84.070715 | 88.65 |
| R0694 | 694 | 3830 | 31.770635 | -84.071115 | 94.1  |
| R0695 | 695 | 2585 | 31.773375 | -84.07156  | 94.3  |
| R0696 | 696 | 2802 | 31.775825 | -84.07243  | 94.2  |
| R0697 | 697 | 3506 | 31.77826  | -84.073565 | 93.1  |
| R0698 | 698 | 2905 | 31.77879  | -84.07709  | 93.25 |
| R0699 | 699 | 2767 | 31.77821  | -84.082235 | 90.05 |
| R0700 | 700 | 3794 | 31.778505 | -84.08616  | 91.65 |
| R0701 | 701 | 2600 | 31.77917  | -84.08958  | 86.35 |
| R0702 | 702 | 3841 | 31.77986  | -84.093025 | 86.95 |
| R0703 | 703 | 3006 | 31.780045 | -84.096525 | 88.9  |
| R0704 | 704 | 3955 | 31.777085 | -84.103335 | 86.6  |
| R0705 | 705 | 1644 | 31.77331  | -84.113085 | 84.95 |
| R0706 | 706 | 1702 | 31.773185 | -84.11707  | 86.95 |
| R0707 | 707 | 2103 | 31.77319  | -84.12053  | 86.75 |
| R0708 | 708 | 2981 | 31.773245 | -84.124795 | 83.5  |
| R0709 | 709 | 1739 | 31.77404  | -84.127225 | 86.1  |
| R0710 | 710 | 1846 | 31.775985 | -84.12982  | 84.6  |
| R0711 | 711 | 2110 | 31.777945 | -84.132405 | 79.4  |
| R0712 | 712 | 2109 | 31.778925 | -84.133755 | 79.9  |
| R0713 | 713 | 1609 | 31.78394  | -84.13367  | 83.1  |
| R0714 | 714 | 2220 | 31.789945 | -84.129415 | 88.3  |
| R0715 | 715 | 3863 | 31.7961   | -84.125195 | 87.6  |

|       |     |      |             |            |        |
|-------|-----|------|-------------|------------|--------|
| R0716 | 716 | 3581 | 31.803345   | -84.12018  | 92.55  |
| R0717 | 717 | 2106 | 31.809075   | -84.116865 | 90.65  |
| R0718 | 718 | 2448 | 31.814275   | -84.11369  | 90.25  |
| R0719 | 719 | 2721 | 31.820135   | -84.110395 | 96.45  |
| R0720 | 720 | 1616 | 31.82127    | -84.11309  | 92.55  |
| R0721 | 721 | 3994 | 31.82246    | -84.11616  | 88.6   |
| R0722 | 722 | 2737 | 31.823475   | -84.119055 | 90.8   |
| R0723 | 723 | 2041 | 31.82462334 | -84.121592 | 92.55  |
| R0724 | 724 | 2941 | 31.82582    | -84.124225 | 91.1   |
| R0725 | 725 | 2402 | 31.82717    | -84.12698  | 86.7   |
| R0726 | 726 | 3858 | 31.828605   | -84.129005 | 89     |
| R0727 | 727 | 3912 | 31.830155   | -84.13113  | 90.8   |
| R0728 | 728 | 4000 | 31.832125   | -84.13266  | 91.9   |
| R0729 | 729 | 2520 | 31.83421    | -84.133925 | 93.25  |
| R0730 | 730 | 2399 | 31.836495   | -84.135315 | 95.85  |
| R0731 | 731 | 2720 | 31.83864    | -84.136665 | 92.6   |
| R0732 | 732 | 3883 | 31.840725   | -84.137935 | 89.5   |
| R0733 | 733 | 1580 | 31.842865   | -84.13926  | 91.1   |
| R0734 | 734 | 3856 | 31.84541    | -84.14027  | 90.1   |
| R0735 | 735 | 4012 | 31.84759    | -84.141455 | 93.45  |
| R0736 | 736 | 3953 | 31.849095   | -84.14387  | 90.4   |
| R0737 | 737 | 4081 | 31.850255   | -84.14638  | 82.75  |
| R0738 | 738 | 4035 | 31.85153    | -84.148965 | 87.55  |
| R0739 | 739 | 1909 | 31.852905   | -84.15154  | 88.15  |
| R0740 | 740 | 4008 | 31.85426    | -84.15373  | 92.7   |
| R0741 | 741 | 2505 | 31.85578    | -84.155965 | 97.65  |
| R0742 | 742 | 2206 | 31.85793    | -84.15815  | 95.35  |
| R0743 | 743 | 4069 | 31.859435   | -84.15967  | 91.35  |
| R0744 | 744 | 2682 | 31.86167    | -84.1613   | 105.95 |
| R0745 | 745 | 2587 | 31.863595   | -84.162575 | 96.5   |
| R0746 | 746 | 1707 | 31.8651     | -84.16446  | 98.95  |
| R0747 | 747 | 2062 | 31.8669     | -84.166675 | 94.75  |
| R0748 | 748 | 4054 | 31.86859    | -84.16882  | 96.25  |
| R0749 | 749 | 2891 | 31.870195   | -84.170945 | 95.15  |
| R0750 | 750 | 2993 | 31.871575   | -84.17324  | 94.35  |
| R0751 | 751 | 2468 | 31.87294    | -84.17529  | 96.85  |
| R0752 | 752 | 4027 | 31.87482    | -84.17762  | 97.45  |
| R0753 | 753 | 2683 | 31.876295   | -84.17953  | 94.9   |
| R0754 | 754 | 4037 | 31.877865   | -84.18144  | 97.35  |
| R0755 | 755 | 3747 | 31.87996    | -84.1831   | 95.8   |
| R0756 | 756 | 3569 | 31.882225   | -84.184615 | 96.4   |
| R0757 | 757 | 3904 | 31.884405   | -84.185195 | 98.6   |
| R0758 | 758 | 3840 | 31.887195   | -84.18586  | 95.3   |
| R0759 | 759 | 3749 | 31.89004    | -84.18641  | 93.2   |
| R0760 | 760 | 2066 | 31.892845   | -84.186655 | 93.25  |
| R0761 | 761 | 2075 | 31.89583    | -84.18688  | 95.55  |
| R0762 | 762 | 1828 | 31.898275   | -84.18814  | 95.8   |
| R0763 | 763 | 2672 | 31.89711    | -84.193795 | 95.7   |

|       |     |      |           |            |        |
|-------|-----|------|-----------|------------|--------|
| R0764 | 764 | 2067 | 31.89363  | -84.20334  | 97.5   |
| R0765 | 765 | 1945 | 31.89353  | -84.2077   | 107.05 |
| R0766 | 766 | 2655 | 31.89362  | -84.21207  | 110.7  |
| R0767 | 767 | 1937 | 31.89523  | -84.213925 | 112.35 |
| R0768 | 768 | 3001 | 31.897165 | -84.21531  | 112.75 |
| R0769 | 769 | 2213 | 31.899375 | -84.21677  | 113.15 |
| R0770 | 770 | 2751 | 31.901565 | -84.218225 | 113.1  |
| R0771 | 771 | 2450 | 31.903495 | -84.21964  | 113.75 |
| R0772 | 772 | 1812 | 31.90529  | -84.221235 | 118.2  |
| R0773 | 773 | 2195 | 31.908595 | -84.221275 | 112    |
| R0774 | 774 | 2166 | 31.911015 | -84.22238  | 112.9  |
| R0775 | 775 | 2736 | 31.91292  | -84.223765 | 106.85 |
| R0776 | 776 | 1743 | 31.91501  | -84.225315 | 113.2  |
| R0777 | 777 | 1823 | 31.917175 | -84.22675  | 125.75 |
| R0778 | 778 | 4076 | 31.91911  | -84.22848  | 120.55 |
| R0779 | 779 | 1600 | 31.92141  | -84.22934  | 116.85 |
| R0780 | 780 | 3804 | 31.923835 | -84.230225 | 116.35 |
| R0781 | 781 | 2724 | 31.92632  | -84.231205 | 123.7  |
| R0782 | 782 | 2095 | 31.92846  | -84.23248  | 120.75 |
| R0783 | 783 | 1622 | 31.930665 | -84.23386  | 117.3  |
| R0784 | 784 | 2407 | 31.932685 | -84.23529  | 113.9  |
| R0785 | 785 | 2556 | 31.93479  | -84.236895 | 109.6  |
| R0786 | 786 | 3839 | 31.936945 | -84.238615 | 112    |
| R0787 | 787 | 2662 | 31.93898  | -84.239855 | 114.25 |
| R0788 | 788 | 2401 | 31.940485 | -84.241795 | 113.55 |
| R0789 | 789 | 2211 | 31.94256  | -84.24341  | 122.15 |
| R0790 | 790 | 2869 | 31.94458  | -84.24465  | 122.05 |
| R0791 | 791 | 1779 | 31.94703  | -84.24595  | 115.25 |
| R0792 | 792 | 2656 | 31.94854  | -84.24784  | 114.45 |
| R0793 | 793 | 2842 | 31.948625 | -84.251825 | 121.5  |
| R0794 | 794 | 1554 | 31.948975 | -84.25537  | 116.65 |
| R0795 | 795 | 3999 | 31.952135 | -84.25542  | 112.85 |
| R0796 | 796 | 1620 | 31.95537  | -84.25544  | 113.15 |
| R0797 | 797 | 2923 | 31.956895 | -84.257725 | 116.25 |
| R0798 | 798 | 2860 | 31.957215 | -84.26173  | 120.25 |
| R0799 | 799 | 2908 | 31.96049  | -84.26157  | 123.75 |
| R0800 | 800 | 2639 | 31.96371  | -84.26145  | 120.35 |
| R0801 | 801 | 2454 | 31.965135 | -84.263975 | 125.25 |
| R0802 | 802 | 3735 | 31.967085 | -84.26545  | 122.35 |
| R0803 | 803 | 4046 | 31.970355 | -84.2653   | 121.8  |
| R0804 | 804 | 3004 | 31.973645 | -84.265085 | 117.9  |
| R0805 | 805 | 2546 | 31.97806  | -84.263575 | 112.85 |
| R0806 | 806 | 2160 | 31.981715 | -84.262725 | 108.9  |
| R0807 | 807 | 2500 | 31.984255 | -84.26322  | 116.6  |
| R0808 | 808 | 2796 | 31.986995 | -84.263845 | 116    |
| R0809 | 809 | 3889 | 31.98961  | -84.264455 | 115.5  |
| R0810 | 810 | 1913 | 31.992655 | -84.26458  | 111.15 |
| R0811 | 811 | 1576 | 31.99541  | -84.26498  | 124.6  |

|       |     |      |             |            |        |
|-------|-----|------|-------------|------------|--------|
| R0812 | 812 | 3938 | 31.99736667 | -84.266692 | 117.9  |
| R0813 | 813 | 1973 | 31.999385   | -84.268285 | 127.15 |
| R0814 | 814 | 2134 | 32.00167    | -84.26944  | 122.15 |
| R0815 | 815 | 2151 | 32.00409    | -84.270445 | 121.45 |
| R0816 | 816 | 2798 | 32.00649    | -84.27153  | 123.65 |
| R0817 | 817 | 1884 | 32.006495   | -84.275705 | 125.9  |
| R0818 | 818 | 4017 | 32.00668    | -84.27996  | 127.1  |
| R0819 | 819 | 2225 | 32.006865   | -84.28403  | 133.1  |
| R0820 | 820 | 4074 | 32.00698    | -84.28809  | 130    |
| R0821 | 821 | 1738 | 32.00689    | -84.29244  | 136.75 |
| R0822 | 822 | 1655 | 32.00718    | -84.296625 | 134.9  |
| R0823 | 823 | 3007 | 32.00731    | -84.300895 | 134.85 |
| R0824 | 824 | 2496 | 32.00753    | -84.30481  | 131.6  |
| R0825 | 825 | 3610 | 32.0091     | -84.306715 | 122.3  |
| R0826 | 826 | 3614 | 32.008255   | -84.312015 | 132.25 |
| R0827 | 827 | 1646 | 32.00973    | -84.31457  | 139.75 |
| R0828 | 828 | 3941 | 32.01301    | -84.31454  | 137.25 |
| R0829 | 829 | 2218 | 32.01614    | -84.31441  | 133.15 |
| R0830 | 830 | 4002 | 32.019285   | -84.314335 | 133.2  |
| R0831 | 831 | 1803 | 32.022675   | -84.3139   | 133.4  |
| R0832 | 832 | 1550 | 32.024255   | -84.316115 | 136.4  |
| R0833 | 833 | 2508 | 32.024415   | -84.320215 | 136.65 |
| R0834 | 834 | 1521 | 32.024425   | -84.32431  | 149.6  |
| R0835 | 835 | 1910 | 32.02454    | -84.32876  | 146.95 |
| R0836 | 836 | 3801 | 32.024735   | -84.33275  | 141.65 |
| R0837 | 837 | 2746 | 32.02471    | -84.336975 | 144.65 |
| R0838 | 838 | 2518 | 32.02486    | -84.34118  | 143.75 |
| R0839 | 839 | 2260 | 32.02496    | -84.345545 | 140.2  |
| R0840 | 840 | 3636 | 32.02508    | -84.34961  | 145    |
| R0841 | 841 | 2679 | 32.025175   | -84.354005 | 153.15 |
| R0842 | 842 | 3765 | 32.028025   | -84.35394  | 152.45 |
| R0843 | 843 | 2645 | 32.03125    | -84.35382  | 152.6  |
| R0844 | 844 | 3660 | 32.03648    | -84.35069  | 157.45 |
| R0845 | 845 | 3842 | 32.044105   | -84.34381  | 146.3  |
| R0846 | 846 | 1849 | 32.047385   | -84.344535 | 148.8  |
| R0847 | 847 | 1758 | 32.0476     | -84.348055 | 148.7  |
| R0848 | 848 | 1595 | 32.04763    | -84.352185 | 153    |
| R0849 | 849 | 2742 | 32.04763    | -84.356975 | 156.6  |
| R0850 | 850 | 2859 | 32.047755   | -84.361555 | 152.4  |
| R0851 | 851 | 3680 | 32.047875   | -84.365745 | 160.05 |
| R0852 | 852 | 3831 | 32.047995   | -84.370555 | 160.6  |
| R0853 | 853 | 2149 | 32.0481     | -84.373255 | 159.9  |
| R0854 | 854 | 2178 | 32.049845   | -84.37583  | 158.55 |
| R0855 | 855 | 1755 | 32.04996    | -84.379915 | 159.75 |
| R0856 | 856 | 3755 | 32.05001    | -84.38434  | 160.5  |
| R0857 | 857 | 2240 | 32.049925   | -84.388325 | 160.7  |
| R0858 | 858 | 2644 | 32.05438    | -84.386265 | 158.65 |
| R0859 | 859 | 2029 | 32.060505   | -84.382535 | 162.45 |

|       |     |      |           |            |        |
|-------|-----|------|-----------|------------|--------|
| R0860 | 860 | 1730 | 32.06551  | -84.37973  | 162.75 |
| R0861 | 861 | 2884 | 32.069055 | -84.37945  | 164.85 |
| R0862 | 862 | 2642 | 32.07248  | -84.378865 | 164    |
| R0863 | 863 | 2865 | 32.075815 | -84.37855  | 168.6  |
| R0864 | 864 | 2947 | 32.079225 | -84.37814  | 166.8  |
| R0865 | 865 | 1590 | 32.08294  | -84.377685 | 171    |
| R0866 | 866 | 2540 | 32.085975 | -84.377595 | 167.5  |
| R0867 | 867 | 2167 | 32.08906  | -84.37753  | 167.7  |
| R0868 | 868 | 2897 | 32.09239  | -84.377335 | 167.45 |
| R0869 | 869 | 2578 | 32.095515 | -84.377195 | 164.8  |
| R0870 | 870 | 2909 | 32.098195 | -84.377825 | 160.3  |
| R0871 | 871 | 2533 | 32.10067  | -84.378685 | 161.75 |
| R0872 | 872 | 2563 | 32.10329  | -84.379505 | 164.1  |
| R0873 | 873 | 3573 | 32.10603  | -84.379985 | 162.75 |
| R0874 | 874 | 3653 | 32.108845 | -84.38045  | 162.15 |
| R0875 | 875 | 2560 | 32.11163  | -84.380775 | 160.4  |
| R0876 | 876 | 2678 | 32.114555 | -84.381165 | 158.25 |
| R0877 | 877 | 2584 | 32.116965 | -84.38248  | 157.15 |
| R0878 | 878 | 2611 | 32.116845 | -84.386615 | 154.2  |
| R0879 | 879 | 2734 | 32.11699  | -84.3909   | 163.25 |
| R0880 | 880 | 3900 | 32.116815 | -84.3961   | 148.75 |
| R0881 | 881 | 3952 | 32.116805 | -84.399685 | 143.9  |
| R0882 | 882 | 4093 | 32.11413  | -84.407935 | 157.9  |
| R0883 | 883 | 2813 | 32.114205 | -84.412155 | 165.45 |
| R0884 | 884 | 2548 | 32.117265 | -84.412205 | 171.35 |
| R0885 | 885 | 1766 | 32.12033  | -84.41215  | 178.55 |
| R0886 | 886 | 3605 | 32.12357  | -84.412035 | 172    |
| R0887 | 887 | 3623 | 32.12661  | -84.41198  | 164.85 |
| R0888 | 888 | 3739 | 32.129835 | -84.411915 | 173.65 |
| R0889 | 889 | 3654 | 32.133025 | -84.41182  | 174.55 |
| R0890 | 890 | 4031 | 32.136175 | -84.41183  | 172.55 |
| R0891 | 891 | 2203 | 32.139365 | -84.411705 | 172    |
| R0892 | 892 | 1745 | 32.142495 | -84.41171  | 173.4  |
| R0893 | 893 | 2087 | 32.145735 | -84.41153  | 175.6  |
| R0894 | 894 | 2487 | 32.148385 | -84.41235  | 169.7  |
| R0895 | 895 | 1764 | 32.14909  | -84.415575 | 170.85 |
| R0896 | 896 | 2128 | 32.149695 | -84.41902  | 173.15 |
| R0897 | 897 | 2534 | 32.150695 | -84.421995 | 175.25 |
| R0898 | 898 | 1895 | 32.15228  | -84.42388  | 173.8  |
| R0899 | 899 | 2199 | 32.15424  | -84.425575 | 176.65 |
| R0900 | 900 | 2139 | 32.15653  | -84.42681  | 171.65 |
| R0901 | 901 | 3668 | 32.15887  | -84.42785  | 182    |
| R0902 | 902 | 2743 | 32.16125  | -84.428885 | 186.5  |
| R0903 | 903 | 1916 | 32.16358  | -84.429985 | 190.7  |
| R0904 | 904 | 2628 | 32.16538  | -84.43194  | 188.6  |
| R0905 | 905 | 2673 | 32.16678  | -84.434385 | 189.5  |
| R0906 | 906 | 4084 | 32.16851  | -84.4361   | 188.9  |
| R0907 | 907 | 3985 | 32.17051  | -84.43781  | 188    |

|       |       |             |           |            |        |
|-------|-------|-------------|-----------|------------|--------|
| R0908 | 908   | 3737        | 32.17255  | -84.439335 | 186.25 |
| R0909 | 909   | 3880        | 32.174655 | -84.44065  | 186.7  |
| R0910 | 910   | 2603        | 32.176845 | -84.441955 | 184.65 |
| R0911 | 911   | 3666        | 32.178605 | -84.443805 | 185.95 |
| R0912 | 912   | 2502        | 32.180355 | -84.445865 | 185.4  |
| R0913 | 913   | 2949        | 32.18191  | -84.447995 | 181.8  |
| R0914 | 914   | 3784        | 32.18331  | -84.45038  | 186.3  |
| R0915 | 915   | 3898        | 32.18484  | -84.45257  | 180    |
| R0916 | 916   | 2732        | 32.186545 | -84.454615 | 183.4  |
| R0917 | 917   | 3633        | 32.18821  | -84.45653  | 191.35 |
| R0918 | 918   | 3853        | 32.190005 | -84.45845  | 187.75 |
| R0919 | 919   | 1548        | 32.191635 | -84.460325 | 184.2  |
| R0920 | 920   | 2761        | 32.19339  | -84.46211  | 182    |
| R0921 | 921   | 3888        | 32.195275 | -84.46413  | 182.5  |
| R0922 | 922   | 4060        | 32.197005 | -84.46608  | 184.1  |
| R0923 | 923   | 1925        | 32.198405 | -84.468365 | 184.8  |
| R0924 | 924   | 1798        | 32.199805 | -84.47085  | 185.8  |
| R0925 | 925   | 3624        | 32.201175 | -84.473255 | 185.3  |
| R0926 | 926   | 2939        | 32.202605 | -84.475615 | 189.95 |
| R0927 | 927   | 1992        | 32.20429  | -84.47745  | 193.2  |
| R0928 | 928   | 2889        | 32.20628  | -84.47909  | 198.1  |
| F0929 | F0929 | T11_missing | 32.20798  | -84.48115  | 190.3  |
| R0930 | 930   | 3611        | 32.20924  | -84.48376  | 194.05 |
| R0931 | 931   | 1902        | 32.21047  | -84.486375 | 193.6  |
| R0932 | 932   | 3642        | 32.21164  | -84.489145 | 196.95 |
| R0933 | 933   | 2576        | 32.213205 | -84.491365 | 192.2  |
| R0934 | 934   | 2617        | 32.214725 | -84.493455 | 193.15 |
| R0935 | 935   | 2733        | 32.21637  | -84.495595 | 197.8  |
| R0936 | 936   | 2862        | 32.218565 | -84.496835 | 193.45 |
| R0937 | 937   | 3828        | 32.220735 | -84.498025 | 195.55 |
| R0938 | 938   | 2529        | 32.22309  | -84.4991   | 194.05 |
| R0939 | 939   | 2838        | 32.22531  | -84.500285 | 195.55 |
| R0940 | 940   | 2569        | 32.22815  | -84.500625 | 195.65 |
| R0941 | 941   | 3617        | 32.23125  | -84.50072  | 196.45 |
| R0942 | 942   | 2868        | 32.233935 | -84.501355 | 200.7  |
| R0943 | 943   | 2640        | 32.236245 | -84.50249  | 199.05 |
| R0944 | 944   | 3674        | 32.2384   | -84.50391  | 201.2  |
| R0945 | 945   | 3807        | 32.2405   | -84.50528  | 207.25 |
| R0946 | 946   | 3782        | 32.241225 | -84.508905 | 201.55 |
| R0947 | 947   | 2113        | 32.24117  | -84.513235 | 197.3  |
| R0948 | 948   | 2480        | 32.24116  | -84.51756  | 177.75 |
| R0949 | 949   | 1546        | 32.24101  | -84.52175  | 169.9  |
| R0950 | 950   | 2143        | 32.24113  | -84.526165 | 168.75 |
| R0951 | 951   | 2124        | 32.241155 | -84.53051  | 175.45 |
| R0952 | 952   | 1808        | 32.241235 | -84.534755 | 169.95 |
| R0953 | 953   | 2464        | 32.2413   | -84.53896  | 165.15 |
| R0954 | 954   | 2471        | 32.241295 | -84.543355 | 175.05 |
| R0955 | 955   | 1907        | 32.23942  | -84.550165 | 170.85 |



|       |      |      |           |            |        |
|-------|------|------|-----------|------------|--------|
| R0956 | 956  | 1528 | 32.24092  | -84.5522   | 154.4  |
| R0957 | 957  | 1717 | 32.2435   | -84.55406  | 144.45 |
| R0958 | 958  | 1920 | 32.245105 | -84.55516  | 156.1  |
| R0959 | 959  | 2171 | 32.24708  | -84.556925 | 166.3  |
| R0960 | 960  | 1682 | 32.248645 | -84.559    | 184.15 |
| R0961 | 961  | 2543 | 32.25019  | -84.561235 | 188.45 |
| R0962 | 962  | 3771 | 32.251975 | -84.562925 | 186.85 |
| R0963 | 963  | 2890 | 32.255225 | -84.56276  | 175.2  |
| R0964 | 964  | 2660 | 32.25827  | -84.562745 | 184.15 |
| R0965 | 965  | 3605 | 32.259615 | -84.56558  | 185.15 |
| R0966 | 966  | 3816 | 32.25855  | -84.571335 | 169.9  |
| R0967 | 967  | 1810 | 32.255515 | -84.579905 | 147.35 |
| R0968 | 968  | 2913 | 32.254535 | -84.585435 | 169.05 |
| R0969 | 969  | 2510 | 32.255685 | -84.5882   | 174.35 |
| R0970 | 970  | 2864 | 32.25677  | -84.59101  | 175    |
| R0971 | 971  | 2907 | 32.25732  | -84.59483  | 179.25 |
| R0972 | 972  | 2934 | 32.257175 | -84.599195 | 180.75 |
| R0973 | 973  | 2532 | 32.25506  | -84.60631  | 185    |
| R0974 | 974  | 2619 | 32.253955 | -84.61216  | 193.3  |
| R0975 | 975  | 4052 | 32.254325 | -84.61619  | 190.35 |
| R0976 | 976  | 1559 | 32.25486  | -84.61969  | 193.7  |
| R0977 | 977  | 2486 | 32.25791  | -84.619855 | 195.15 |
| R0978 | 978  | 2158 | 32.26015  | -84.621065 | 203.45 |
| R0979 | 979  | 3685 | 32.262175 | -84.622495 | 202.85 |
| R0980 | 980  | 2086 | 32.264395 | -84.623945 | 197.55 |
| R0981 | 981  | 1516 | 32.26782  | -84.62323  | 201.2  |
| R0982 | 982  | 2491 | 32.270615 | -84.623705 | 197.7  |
| R0983 | 983  | 1688 | 32.272625 | -84.625165 | 203.5  |
| R0984 | 984  | 2065 | 32.27421  | -84.627475 | 209.6  |
| R0985 | 985  | 2455 | 32.276025 | -84.629355 | 202.7  |
| R0986 | 986  | 2159 | 32.27811  | -84.63064  | 201.1  |
| R0987 | 987  | 3825 | 32.282625 | -84.63433  | 206.1  |
| R0988 | 988  | 1784 | 32.29106  | -84.62145  | 153.3  |
| R0989 | 989  | 1731 | 32.29238  | -84.62409  | 153    |
| R0990 | 990  | 1804 | 32.300225 | -84.6173   | 168.7  |
| R0991 | 991  | 2172 | 32.303535 | -84.617045 | 176.8  |
| R0992 | 992  | 1746 | 32.30479  | -84.61985  | 178.5  |
| R0993 | 993  | 2035 | 32.305385 | -84.623335 | 182.2  |
| R0994 | 994  | 1915 | 32.306045 | -84.62675  | 178.3  |
| R0995 | 995  | 2189 | 32.306665 | -84.63005  | 176.25 |
| R0996 | 996  | 1821 | 32.30728  | -84.63344  | 166.9  |
| R0997 | 997  | 3599 | 32.308035 | -84.637295 | 182.1  |
| R0998 | 998  | 4006 | 32.30854  | -84.640555 | 181.45 |
| R0999 | 999  | 1794 | 32.30887  | -84.64452  | 185.9  |
| R1000 | 1000 | 2209 | 32.30916  | -84.6484   | 188.85 |
| R1001 | 1001 | 1914 | 32.309425 | -84.6524   | 203.05 |
| R1002 | 1002 | 2417 | 32.311195 | -84.654185 | 210.6  |
| R1003 | 1003 | 1768 | 32.313575 | -84.65515  | 198.3  |

|       |      |      |           |            |        |
|-------|------|------|-----------|------------|--------|
| R1004 | 1004 | 1683 | 32.31639  | -84.655555 | 204.05 |
| R1005 | 1005 | 2488 | 32.321465 | -84.653215 | 205.45 |
| R1006 | 1006 | 1692 | 32.32382  | -84.65393  | 208.9  |
| R1007 | 1007 | 2137 | 32.325505 | -84.65607  | 210.05 |
| R1008 | 1008 | 2630 | 32.32691  | -84.658365 | 214.95 |
| R1009 | 1009 | 3665 | 32.329495 | -84.65933  | 216.45 |
| R1010 | 1010 | 3790 | 32.332315 | -84.659365 | 226.55 |
| R1011 | 1011 | 1809 | 32.33565  | -84.659305 | 223.9  |
| R1012 | 1012 | 1514 | 32.34255  | -84.654    | 227.3  |
| R1013 | 1013 | 2096 | 32.3474   | -84.651465 | 223.05 |
| R1014 | 1014 | 1771 | 32.350785 | -84.651205 | 225.25 |
| R1015 | 1015 | 2920 | 32.354075 | -84.651145 | 223.1  |
| R1016 | 1016 | 2896 | 32.3593   | -84.648065 | 229.3  |
| R1017 | 1017 | 4038 | 32.36258  | -84.64789  | 224.6  |
| R1018 | 1018 | 2070 | 32.364805 | -84.649215 | 231.45 |
| R1019 | 1019 | 2497 | 32.36721  | -84.65026  | 220.45 |
| R1020 | 1020 | 2701 | 32.368695 | -84.652465 | 226.3  |
| R1021 | 1021 | 2809 | 32.37038  | -84.654485 | 224    |
| R1022 | 1022 | 1776 | 32.372    | -84.65659  | 233.45 |
| R1023 | 1023 | 2883 | 32.3731   | -84.659732 | 221.8  |
| R1024 | 1024 | 1562 | 32.37182  | -84.66562  | 232.7  |
| R1025 | 1025 | 2212 | 32.372995 | -84.66822  | 216.6  |
| R1026 | 1026 | 1570 | 32.37441  | -84.670575 | 217.25 |
| R1027 | 1027 | 1599 | 32.37582  | -84.672935 | 222.8  |
| R1028 | 1028 | 1774 | 32.37735  | -84.67518  | 228.15 |
| R1029 | 1029 | 2018 | 32.379205 | -84.676845 | 221.55 |
| R1030 | 1030 | 1750 | 32.38108  | -84.67849  | 216.85 |
| R1031 | 1031 | 1980 | 32.38304  | -84.68019  | 201.2  |
| R1032 | 1032 | 1519 | 32.384995 | -84.682    | 185.4  |
| R1033 | 1033 | 2396 | 32.38689  | -84.683545 | 185.3  |
| R1034 | 1034 | 1628 | 32.388815 | -84.68515  | 176.4  |
| R1035 | 1035 | 2142 | 32.39108  | -84.68645  | 179.95 |
| R1036 | 1036 | 2131 | 32.39322  | -84.687735 | 170.2  |
| R1037 | 1037 | 1952 | 32.395365 | -84.68906  | 164.65 |
| R1038 | 1038 | 1898 | 32.39721  | -84.690895 | 162.4  |
| R1039 | 1039 | 1633 | 32.39885  | -84.692925 | 169.65 |
| R1040 | 1040 | 1555 | 32.400625 | -84.694825 | 169.85 |
| R1041 | 1041 | 2693 | 32.40283  | -84.696095 | 165.25 |
| R1042 | 1042 | 2153 | 32.405235 | -84.69735  | 161.35 |
| R1043 | 1043 | 1617 | 32.40744  | -84.698495 | 167.55 |
| R1044 | 1044 | 1793 | 32.409635 | -84.699785 | 169.35 |
| R1045 | 1045 | 3619 | 32.411275 | -84.70145  | 162.45 |
| R1046 | 1046 | 1974 | 32.413025 | -84.703755 | 159.7  |
| R1047 | 1047 | 3799 | 32.414595 | -84.70586  | 149.45 |
| R1048 | 1048 | 2015 | 32.41628  | -84.708025 | 149.3  |
| R1049 | 1049 | 1893 | 32.41782  | -84.71007  | 154.45 |
| R1050 | 1050 | 1751 | 32.41943  | -84.712185 | 156.5  |
| R1051 | 1051 | 2182 | 32.42104  | -84.71429  | 161.05 |

|       |      |      |           |            |        |
|-------|------|------|-----------|------------|--------|
| R1052 | 1052 | 2268 | 32.422635 | -84.71635  | 166.2  |
| R1053 | 1053 | 1705 | 32.424545 | -84.71799  | 164.25 |
| R1054 | 1054 | 3688 | 32.42667  | -84.71953  | 164.7  |
| R1055 | 1055 | 2614 | 32.428675 | -84.72113  | 159.3  |
| R1056 | 1056 | 2846 | 32.430145 | -84.723555 | 151.9  |
| R1057 | 1057 | 2068 | 32.43148  | -84.72567  | 150.4  |
| R1058 | 1058 | 1720 | 32.433355 | -84.727505 | 138.05 |
| R1059 | 1059 | 3795 | 32.435175 | -84.72926  | 124.75 |
| R1060 | 1060 | 2999 | 32.437045 | -84.731055 | 118.55 |
| R1061 | 1061 | 3714 | 32.43877  | -84.732735 | 103.05 |
| R1062 | 1062 | 3009 | 32.440875 | -84.73475  | 103.95 |
| R1063 | 1063 | 1954 | 32.44257  | -84.73641  | 105.3  |
| R1064 | 1064 | 2653 | 32.444445 | -84.73826  | 121.2  |
| R1065 | 1065 | 2193 | 32.44554  | -84.741085 | 123.15 |
| R1066 | 1066 | 2192 | 32.44533  | -84.745665 | 112.15 |
| R1067 | 1067 | 2577 | 32.445055 | -84.750725 | 112.1  |
| R1068 | 1068 | 3684 | 32.445225 | -84.755205 | 101.3  |
| R1069 | 1069 | 2393 | 32.44562  | -84.759515 | 101.45 |
| R1070 | 1070 | 1659 | 32.446515 | -84.762145 | 94.4   |
| R1071 | 1071 | 2205 | 32.446935 | -84.76517  | 99.7   |
| R1072 | 1072 | 2173 | 32.44733  | -84.768965 | 115.55 |
| R1073 | 1073 | 2804 | 32.4482   | -84.771995 | 124.6  |
| R1074 | 1074 | 3591 | 32.44907  | -84.775135 | 125.15 |
| R1075 | 1075 | 3767 | 32.4501   | -84.778155 | 130.4  |
| R1076 | 1076 | 1770 | 32.45103  | -84.780935 | 133.65 |
| R1077 | 1077 | 2125 | 32.45211  | -84.783875 | 127.1  |
| R1078 | 1078 | 2848 | 32.45332  | -84.786475 | 111.75 |
| R1079 | 1079 | 2567 | 32.45406  | -84.789885 | 95.7   |
| R1080 | 1080 | 2942 | 32.454415 | -84.7937   | 93.75  |
| R1081 | 1081 | 4020 | 32.455155 | -84.79739  | 105.35 |
| R1082 | 1082 | 1988 | 32.45581  | -84.8005   | 113.4  |
| R1083 | 1083 | 2633 | 32.45639  | -84.803452 | 107.95 |
| R1084 | 1084 | 2138 | 32.45895  | -84.804625 | 116.7  |
| R1085 | 1085 | 1593 | 32.461365 | -84.805595 | 118.65 |
| R1086 | 1086 | 1736 | 32.46323  | -84.807345 | 125.85 |
| R1087 | 1087 | 2183 | 32.47063  | -84.80156  | 110.2  |
| R1088 | 1088 | 1832 | 32.4736   | -84.801595 | 117.85 |
| R1089 | 1089 | 2019 | 32.476655 | -84.80179  | 124.35 |
| R1090 | 1090 | 1651 | 32.481025 | -84.800245 | 117.85 |
| R1091 | 1091 | 1934 | 32.484235 | -84.799945 | 128.05 |
| R1092 | 1092 | 1908 | 32.487445 | -84.79999  | 129.6  |
| R1093 | 1093 | 1900 | 32.49069  | -84.799655 | 135.75 |
| R1094 | 1094 | 1686 | 32.49342  | -84.80047  | 137.05 |
| R1095 | 1095 | 4085 | 32.495305 | -84.80206  | 137.55 |
| R1096 | 1096 | 3822 | 32.497595 | -84.803085 | 143.7  |
| R1097 | 1097 | 1763 | 32.500085 | -84.80397  | 147.85 |
| R1098 | 1098 | 3829 | 32.50247  | -84.80496  | 147.25 |
| R1099 | 1099 | 3805 | 32.50459  | -84.80639  | 144.9  |

|       |      |      |             |             |        |
|-------|------|------|-------------|-------------|--------|
| R1100 | 1100 | 2738 | 32.5063     | -84.80827   | 146.25 |
| R1101 | 1101 | 1773 | 32.50773    | -84.810825  | 154.3  |
| R1102 | 1102 | 2609 | 32.509465   | -84.81269   | 156.7  |
| R1103 | 1103 | 2558 | 32.51114    | -84.814715  | 159.3  |
| R1104 | 1104 | 2925 | 32.512885   | -84.816655  | 157.35 |
| R1105 | 1105 | 3809 | 32.514565   | -84.81866   | 153    |
| R1106 | 1106 | 1709 | 32.516495   | -84.820695  | 155.05 |
| R1107 | 1107 | 2677 | 32.51739167 | -84.7819467 | 162.25 |
| R1108 | 1108 | 3656 | 32.51776    | -84.82743   | 162.1  |
| R1109 | 1109 | 3005 | 32.518195   | -84.831145  | 156.55 |
| R1110 | 1110 | 3721 | 32.520155   | -84.83256   | 153.85 |
| R1111 | 1111 | 2731 | 32.52227    | -84.834035  | 146.2  |
| R1112 | 1112 | 3774 | 32.524325   | -84.83551   | 135.5  |
| R1113 | 1113 | 3587 | 32.526445   | -84.83698   | 128.8  |
| R1114 | 1114 | 3776 | 32.52812    | -84.83888   | 120.85 |
| R1115 | 1115 | 3939 | 32.530375   | -84.840065  | 116.2  |
| R1116 | 1116 | 2426 | 32.53307    | -84.84063   | 116.2  |
| R1117 | 1117 | 3762 | 32.536375   | -84.840405  | 116.25 |
| R1118 | 1118 | 3835 | 32.53957    | -84.840605  | 124.2  |
| R1119 | 1119 | 3802 | 32.543485   | -84.84028   | 135.1  |
| R1120 | 1120 | 2852 | 32.54592    | -84.840305  | 145.6  |
| R1121 | 1121 | 3761 | 32.548995   | -84.840285  | 151.6  |
| R1122 | 1122 | 2739 | 32.552195   | -84.840275  | 136.2  |
| R1123 | 1123 | 2768 | 32.555235   | -84.84028   | 148.05 |
| R1124 | 1124 | 2917 | 32.55837    | -84.84019   | 156.1  |
| R1125 | 1125 | 2706 | 32.561805   | -84.84022   | 153.75 |
| R1126 | 1126 | 1836 | 32.56483    | -84.84022   | 162.95 |
| R1127 | 1127 | 2634 | 32.567205   | -84.8411    | 157.45 |
| R1128 | 1128 | 3783 | 32.5664     | -84.846555  | 148.25 |
| R1129 | 1129 | 3796 | 32.56541    | -84.852675  | 140.35 |
| R1130 | 1130 | 1841 | 32.561085   | -84.861105  | 152.55 |
| R1131 | 1131 | 1729 | 32.56294    | -84.864355  | 151.35 |
| R1132 | 1132 | 2256 | 32.5651     | -84.865685  | 155.8  |
| R1133 | 1133 | 2419 | 32.568535   | -84.865215  | 169.05 |
| R1134 | 1134 | 2098 | 32.572135   | -84.86458   | 165.25 |
| R1135 | 1135 | 1927 | 32.5753     | -84.864575  | 182.95 |
| R1136 | 1136 | 2651 | 32.577975   | -84.865235  | 182.9  |
| R1137 | 1137 | 2654 | 32.5804     | -84.866195  | 185    |
| R1138 | 1138 | 2814 | 32.58258    | -84.86754   | 183.75 |
| R1139 | 1139 | 2427 | 32.584795   | -84.86887   | 190.3  |
| R1140 | 1140 | 2127 | 32.587105   | -84.869965  | 192.25 |
| R1141 | 1141 | 2707 | 32.5893     | -84.87115   | 194.5  |
| R1142 | 1142 | 2446 | 32.591655   | -84.872255  | 196.35 |
| R1143 | 1143 | 2033 | 32.59391    | -84.87332   | 202.45 |
| R1144 | 1144 | 2423 | 32.596195   | -84.874695  | 209.9  |
| R1145 | 1145 | 2400 | 32.598425   | -84.875985  | 210.35 |
| R1146 | 1146 | 2252 | 32.599885   | -84.87842   | 206.25 |
| R1147 | 1147 | 2179 | 32.60253834 | -84.878855  | 204.05 |

|       |      |      |           |            |        |
|-------|------|------|-----------|------------|--------|
| R1148 | 1148 | 1806 | 32.604515 | -84.880515 | 201.8  |
| R1149 | 1149 | 2440 | 32.60649  | -84.881995 | 207.1  |
| R1150 | 1150 | 2082 | 32.60864  | -84.883425 | 204.9  |
| R1151 | 1151 | 1796 | 32.6108   | -84.884905 | 214.25 |
| R1152 | 1152 | 1618 | 32.61281  | -84.88647  | 224.6  |
| R1153 | 1153 | NONE | 32.61449  | -84.88865  | 203.75 |
| R1154 | 1154 | 2249 | 32.61574  | -84.890955 | 193.3  |
| R1155 | 1155 | 1594 | 32.617835 | -84.892245 | 190.75 |
| R1156 | 1156 | 2140 | 32.61976  | -84.894255 | 188.85 |
| R1157 | 1157 | 2928 | 32.62127  | -84.89638  | 195.8  |
| R1158 | 1158 | 4007 | 32.62192  | -84.900045 | 198.2  |
| R1159 | 1159 | 3915 | 32.621915 | -84.90312  | 191.8  |
| R1160 | 1160 | 2519 | 32.623605 | -84.905955 | 190.1  |
| R1161 | 1161 | 1573 | 32.62609  | -84.90745  | 186.6  |
| R1162 | 1162 | 2489 | 32.62705  | -84.90986  | 185.8  |
| R1163 | 1163 | 4015 | 32.628535 | -84.912315 | 186.4  |
| R1164 | 1164 | 3910 | 32.63013  | -84.91427  | 190.75 |
| R1165 | 1165 | 2912 | 32.631335 | -84.917165 | 193.65 |
| R1166 | 1166 | 2541 | 32.62984  | -84.922335 | 191.6  |
| R1167 | 1167 | 4079 | 32.63053  | -84.926925 | 205.65 |
| R1168 | 1168 | 4070 | 32.628845 | -84.933615 | 204    |
| R1169 | 1169 | 3861 | 32.62641  | -84.93876  | 202.6  |
| R1170 | 1170 | 1864 | 32.62717  | -84.944855 | 187.7  |
| R1171 | 1171 | 3838 | 32.62817  | -84.94746  | 175.8  |
| R1172 | 1172 | 3681 | 32.6303   | -84.948755 | 172.2  |
| R1173 | 1173 | 2675 | 32.63288  | -84.949595 | 173.9  |
| R1174 | 1174 | 4034 | 32.635325 | -84.950465 | 174.45 |
| R1175 | 1175 | 2169 | 32.63762  | -84.95173  | 169.9  |
| R1176 | 1176 | 1718 | 32.63999  | -84.952695 | 170.2  |
| R1177 | 1177 | 2718 | 32.642735 | -84.953365 | 163.3  |
| R1178 | 1178 | 2710 | 32.64656  | -84.95227  | 172.15 |
| R1179 | 1179 | 3969 | 32.650075 | -84.951875 | 177.35 |
| R1180 | 1180 | 2416 | 32.6523   | -84.95312  | 185.15 |
| R1181 | 1181 | 1665 | 32.654735 | -84.953975 | 186.1  |
| R1182 | 1182 | 2077 | 32.65718  | -84.95498  | 186.65 |
| R1183 | 1183 | 3892 | 32.659555 | -84.955975 | 190.85 |
| R1184 | 1184 | 2478 | 32.66179  | -84.95725  | 200.1  |
| R1185 | 1185 | 2126 | 32.663875 | -84.958625 | 204.4  |
| R1186 | 1186 | 3732 | 32.66552  | -84.960855 | 207.9  |
| R1187 | 1187 | 4001 | 32.66669  | -84.96358  | 201.2  |
| R1188 | 1188 | 4047 | 32.667645 | -84.966555 | 209.9  |
| R1189 | 1189 | 3875 | 32.66807  | -84.970415 | 208.75 |
| R1190 | 1190 | 3632 | 32.66874  | -84.973855 | 213.3  |
| R1191 | 1191 | 2503 | 32.66959  | -84.976665 | 208.65 |
| R1192 | 1192 | 3951 | 32.6712   | -84.97947  | 206.85 |
| R1193 | 1193 | 3964 | 32.672965 | -84.980835 | 206.35 |
| R1194 | 1194 | 3655 | 32.675115 | -84.98213  | 199.85 |
| R1195 | 1195 | 3836 | 32.67662  | -84.984755 | 203.9  |

|       |      |      |           |            |        |
|-------|------|------|-----------|------------|--------|
| R1196 | 1196 | 4067 | 32.68004  | -84.98453  | 211.9  |
| R1197 | 1197 | 2606 | 32.68302  | -84.98446  | 199.85 |
| R1198 | 1198 | 3873 | 32.685625 | -84.98553  | 188.95 |
| R1199 | 1199 | 3872 | 32.687335 | -84.98653  | 183.75 |
| R1200 | 1200 | 3869 | 32.688665 | -84.987235 | 177.15 |

## **Appendix 2: Other contact information**

### **Drilling and explosives**

Bill Barnes  
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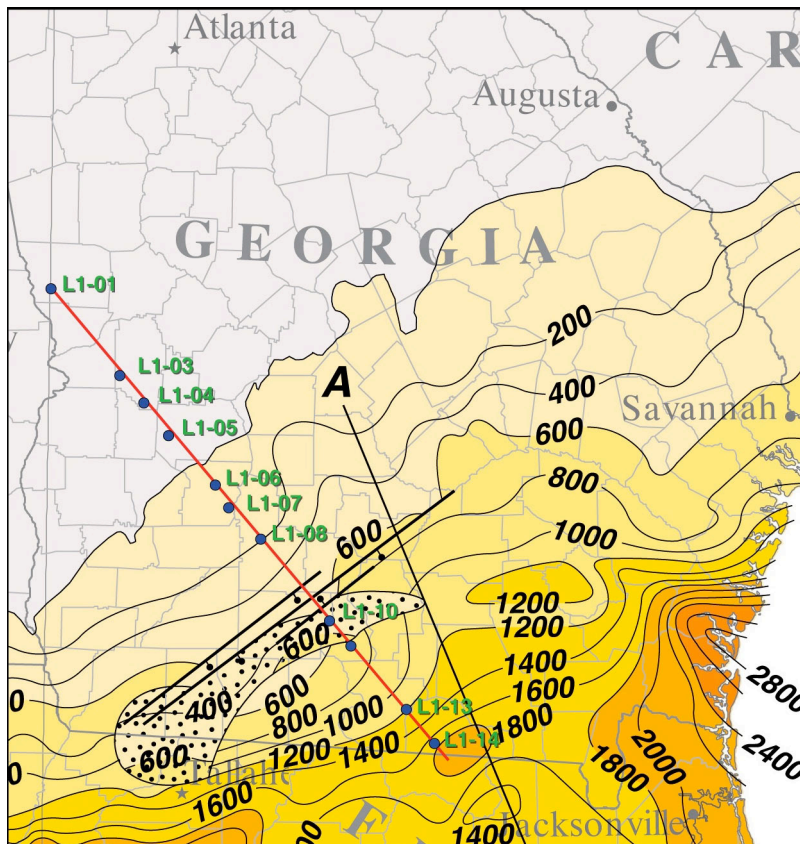
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### Appendix 3: Shallow refraction, sites L1-06 and L1-07

Shallow refraction surveys were conducted at shot sites L1-06 and L1-07 in order to mitigate risks associated with shallow carbonate. SUGAR Line 1 runs in the dip direction of the southeast-thickening Floridan aquifer system (Fig. A-1). This mostly carbonate aquifer system shallows and it thins northwestward toward its updip limit, which lies between shot sites L1-05, beyond the updip limit, and L1-06, where carbonate is shallow and the aquifer is thin. Karst features, including sinkholes, are common in the region near L1-06 and 07, near Albany, GA. Shallow carbonate with associated sinkholes present complications to drilling and risks to seismic shooting. The shallow refraction surveys at these sites were thus conducted in order to estimate the depth to carbonate and design of the depth and charge sizes for these shot holes.

The refraction surveys were recorded using a 24-channel linear array with a 10' geophone spacing (array length 230 feet) deployed once. Shots were fired into this array from a "Betsy" gun (12 gauge shotgun shell with a seismic charge) from a number of locations to give a continuous range of offsets from -485 to +485 feet (Table A-1). Picked first-arrival time from the resulting profiles (Fig. A-2) were modeled using the Zelt and Smith (1989) code. The L1-06 profile includes a reflection phase from the top of a high velocity (10,000 ft/s) unit, indicated by a refraction that breaks out at ~400 m offset, interpreted to be carbonate at a depth of ~100 m depth. The L1-07 profile indicates an upper sedimentary layer that is significantly faster than the upper unit at L1-06, but there is no indication of a high velocity unit evident in the L1-06 profile, which we take to indicate that carbonate lies at greater than 100 m depth below the shot site at L1-07.



**Fig. A-1.** Map showing thickness of Floridan aquifer in Georgia. This mostly carbonate aquifer system shallows and thins to the northwest. Karst features, including sinkholes, are common in the region near L1-06 and 07, near Albany, GA.

(from J. A. Miller, 1986, USGS Prof. Paper 1403-B)

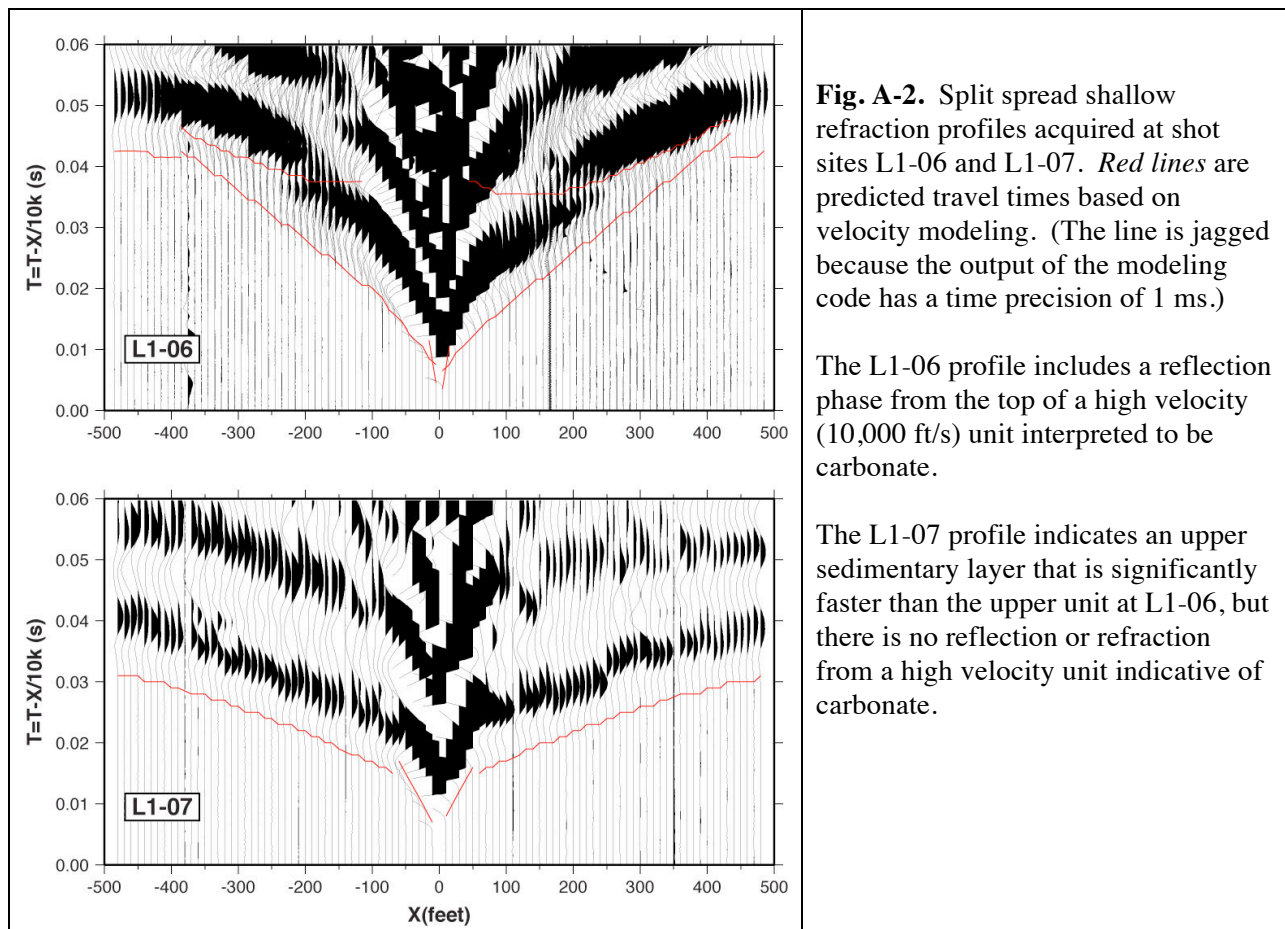
Site L1-06 shallow refraction geometry

| Shot #        | X in line | Offset      | trace     |
|---------------|-----------|-------------|-----------|
| 1000          | 0         | 255 - 485   | 1 - 24    |
| 1001          | 50        | 205 - 435   | 25 - 48   |
| 1002          | 100       | 155 - 385   | 49 - 72   |
| 1003          | 150       | 105 - 335   | 73 - 96   |
| 1004          | 200       | 55 - 285    | 97 - 120  |
| 1005          | 250       | 5 - 235     | 121 - 144 |
| <i>center</i> |           |             |           |
| 1007          | 490       | -235 - -5   | 145 - 168 |
| 1008          | 540       | -285 - -55  | 169 - 192 |
| 1009          | 590       | -335 - -105 | 193 - 216 |
| 1010          | 640       | -385 - -155 | 217 - 240 |
| 1011          | 690       | -435 - -205 | 241 - 264 |
| 1012          | 740       | -485 - -255 | 265 - 288 |

Site L1-07 shallow refraction geometry

| Shot # | X in line | Offset      | trace   |
|--------|-----------|-------------|---------|
| 1000   | 0         | 250 - 480   | 1 - 24  |
| 1001   | 240       | 10 - 240    | 25 - 48 |
| 1002   | 480       | -240 - -10  | 49 - 72 |
| 1003   | 730       | -480 - -250 | 73 - 96 |

**Table A-1.** Geometry for the shallow refraction surveys at shot sites L1-06 and L1-07. The resulting data from each site were interpreted as single split-spread profiles, with the L1-06 profile consequently having substantial redundancy (Fig. A-2).



## **Appendix 4: Data examples**

Profiles for each shot of SUGAR Line 1 are shown. The data have minimal processing, including a minimum-phase band pass filter (4-20 Hz) and trace normalization to the median absolute amplitude within the time window shown. The data are plotted in a rasterized wiggle format to reduce file size.



