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A Newsletter from the Florida Geological Survey

DEP Springs Initiative, FGS Update by Harley Means

In This Issue

DEP Springs Initiative, FGS Update	1-2
Mineral Rights FAQ	2-3
The Chief's Corner	4-5
Governor Appoints Five to the Board of Professional Geologists	5
Hydrogeology Program	6-9
Geologic Data Acquisitions Program	9
Coastal Research Program	9-10
Oil and Gas Update	10-11
News from the FAPG	12
Earth Science Week	12
Lake Jackson Update	12-13
FGS Cooperative Training	13
Florida Sheriffs Youth Ranch Teachers Visit FGS	14
Tallahassee Museum of History and Natural Science	14
Employee Graduation	15
DEP Employee of the Month	15
New Publications	16

The Florida Geological Survey (FGS) is continuing its work this year on the DEP Springs Initiative. As part of this effort, FGS will be revising **The Springs of Florida** (Bulletin 31). The FGS has two teams of two people who visit and describe springs around the state. **Ryan Means** and **Rebecca Meegan** are spring team one and **Robby Jones** and **Alan Willett** make up spring team number two. These teams thus far have located, visited and described over 410 springs in the state.

The Bulletin 31 revision is targeted for publication in April of 2004. It will contain water quality and discharge data for first magnitude springs and some selected second magnitude springs. It will also contain sections on geology, history, water chemistry and sampling protocols. Detailed location maps for the springs that were sampled for water quality will also be included. All additional springs that were visited will have a physical description and GPS location information. The remaining springs that were not visited by the FGS will be listed with location (GPS) data only. Numerous photos of springs will be included on a compact disk that will accompany the publication.

The FGS is also performing quarterly water quality sampling in first magnitude springs in both the Suwannee and St. Johns River Water Management Districts. These springs include: Wacissa, Madison Blue, Manatee, Fanning, Ichetucknee, Troy, Ginnie, Lafayette Blue, Volusia Blue, Silver Glen, Alexander, and Silver. Starting in 2004, our samplers will add Wekiwa and Rock Springs to their regimen and will add some pesticides to the analyte list.

Other Springs Initiative projects ongoing at the FGS include a nutrient and land use study of the Fanning Spring basin. Fanning Spring consistently discharges water with nitrate concentrations at or above 3 mg/liter. This is the



Ryan Means and Rebecca Meegan conducting water sampling in a first magnitude spring.



One of the FGS drill rigs used for coring in Manatee Spring State Park.

highest nitrate concentration in any first magnitude spring. FGS has also produced several spring protection posters depicting springs and threats to their water quality. The Initiative also provided funds to the FGS to conduct an aerial photo survey of selected first and second magnitude springs.

In May, the FGS completed a cooperative agreement with the Suwannee River Water Management District to drill and install monitor wells in Manatee Spring State Park. These wells are unique because they were drilled directly into the conduits that feed Manatee Spring. The conduits were located by cave divers **Mark and Annette Long, Tom Morris, and John Mosley**. The divers were equipped with a radio beacon and were tracked along the surface using a unique receiver designed by **Brian Pease**, a former Navy scientist. The wells

will allow scientists to sample water directly from the conduits that feed Manatee Spring without having to rely on costly and dangerous sampling efforts by cave divers. This is the first time this technology has been used to locate conduits for scientific purposes.

Mineral Rights Frequently Asked Questions

Tips on how to determine the mineral rights on your property.

prepared by **Steve Spencer, P.G.**

The FGS occasionally receives questions from land-owners concerning mineral right associated with their property. Land-owners want to know the best source of information concerning mineral rights. Property owners who do not also own mineral rights want to know if their land can be mined by the owners of the mineral rights. This discussion is based on mineral rights questions that are frequently directed to the Florida Geological Survey, and provides general “tips”. It is not intended as legal advise for property evaluation or assessment. A legal counsel should be consulted as appropriate for such guidance.

[Do the minerals under my property have any value?](#)

This is the underlying concern for most questions concerning mineral rights issues. Before getting to the question of value however, there are other important questions that need to be answered.

[Do you own the minerals under your property?](#)

[1. Background information on the vertical subdivision of property rights](#)

Subsurface rights, just like surface rights, are defined as interests in real property. They are not the minerals themselves or the future marketable commodity. Each of these rights, or interests in real property, are simply different pieces of property.

Sometimes the surface and subsurface rights are owned by the same person in which case, the unqualified ownership of the two properties is called fee simple. Commonly the ownership of these rights differs. In these cases, it is said that the subsurface rights have been severed from the surface rights. Once the rights are severed from each other they run their own chain of title and may or may not come back together at some future date. They may be bought, and sold just like any property.

“Your mineral rights” actually refers to the ownership of the subsurface rights, i.e., that interest in the real property that lies beneath the ground. This is particularly important if the geology of the property includes mineral resources that have value. Mineral resources are economically important when they are found to have quality, quantity, and are extractable and marketable.

How to determine whether you own the minerals under your property.

- a. Your deed
- b. Your title insurance policy
- c. The property appraiser’s office
- d. The county recording office

A Florida landowner should begin their search by looking at their property deed. When you purchased the property, a “title search” was probably conducted. Your deed should include a report of that title search. The deed may include a “schedule” with “reservations”. The most common reference in a deed is to “reservations of record”. “Reservations of record” will provide, relevant information concerning your property’s mineral reservations. Reservations are often handled in this way on deeds.

The title insurance policy should also be examined. It may list severed mineral estates by book and page number. Unless the buyer was represented by an attorney at the closing, the title insurance agent probably exempted “any” minerals that *might have been* severed and thus, it will not tell you whether any minerals were or were not severed. By exempting “any minerals”, the title insurance company is not liable if minerals were severed.

It may be necessary to search documents held at the county court house. A court-house catalogs land holdings by various means such as a property tax identification number. Using this number, it *may* be possible to learn what reservations apply to the property. Often, however, the severed mineral estates are not assigned a tax ID number. This is because the property appraiser did not consider them of sufficient value to be taxed.

If I don’t own the minerals under my property what does that mean?

- 1. Background on rights of entry
 - a. How you get them
 - b. How you keep them
 - c. How you lose them

Florida Statute 704.05, entitled “Easements and rights of entry,” speaks to the matter of entering a property or gaining an easement to property that is reserved for the purpose of mining, drilling or exploring. The right of entry comes automatically with the mineral estate, i.e., the subsurface rights, when that estate is severed. Chapter 712 F.S. entitled “Marketable Record Titles to Real Property” is important because it says that if the holder of the mineral estate has not filed a notice with the state during the proper time frame and continued to do so every 30 years thereafter, he loses his right of entry; however, ownership of the mineral estate is still retained. The mineral estate owner, even though he loses his right to entry, might be able to extract their minerals, such as in the case with oil and gas where slant-drilling techniques are common. If the mineral estate owner loses his right of entry he may be able to renegotiate with the surface owner for access.

continued on page 15



The Chief's Corner by Walt Schmidt

A Brief on the Geology of the Florida Platform (A response to the nagging question; Is there Geology in Florida, and what do Geologists do in Florida?)

The State of Florida represents the exposed portion of a broad carbonate buildup known as the *Florida Platform*. This platform extends westward under the Gulf of Mexico a couple of hundred miles, making the west coast of the Florida Peninsula the approximate center line of the feature. While our surface relief is minor compared to mountainous areas of the earth, our subsurface geology and geomorphology, shaped by marine and surficial processes, is highly complex and offers great interpretative challenges to our geoscience professionals. We typically do not have the luxury of observing miles of outcrops along railroad or highway cuts through mountains or hills to aid in our geologic mapping solutions. The majority of our data comes from subsurface cores, well cuttings, wireline geophysical logs, surface geophysics and water geochemistry. This requires significant skill among our State's geologists to interpolate between known data points, to understand hydrogeochemical processes, and to predict subsurface conditions in areas with little information.

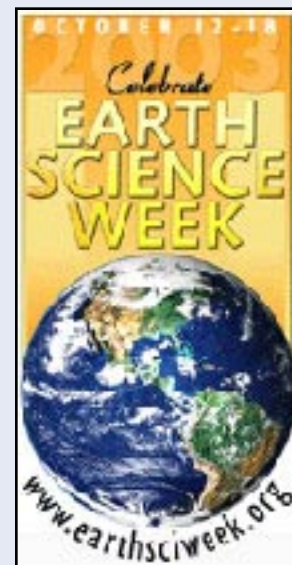
Beneath the thousands of feet of limestones, dolostones, and evaporates that comprise the bulk of the stratigraphic sequence beneath our state, Florida's basement rocks include Precambrian-Cambrian igneous rocks, Ordovician-Devonian sedimentary rocks, and Triassic-Jurassic volcanic rocks. These range in depth from just under 3,500 feet in the north central peninsula to over 18,000 feet in southern Florida. Overlying this basement sequence is the thick accumulation of shallow marine carbonates, reflecting the region's separation from what is now the African Plate when the super-continent Pangea rifted apart in the Triassic – Early Jurassic. The shallow seas flooding into the rifting basin began the long sequence of carbonate buildup we see today as the foundation of the Florida Platform. By the Late Oligocene, the siliciclastic sediments eroding from the southern end of the Appalachian Mountains began to reach the pristine shallow marine environments of the Florida Platform. Throughout the Neogene fluvial, coastal, and shallow marine systems transported siliciclastics onto the platform. Numerous sea-level fluctuations subsequently eroded, redeposited and reworked these sediment packages throughout the area. Superimposed on this complex sequence of migrating coastal environments, are the multifaceted episodes of subsurface and surface karstification that became the precursor for the world-class Floridan Aquifer System. Stratigraphic changes, lithofacies shifts, bedding sequences, joints, fractures, faults, caves, sinkholes, and springs all combine to make our prediction of subsurface fluid movement challenging to say the least. Engineering solutions for contamination clean-up based on standardized models must be based on competent professional geological interpretations as a part of the assessment.

Florida's distinctive geologic history, paleoenvironments, and post-depositional modifications of our geologic units have led to many unique and significant economic mineral deposits. Florida was recently ranked 5th in the Nation with a

combined estimated mineral production of \$1.75 billion. Our state supplies about one-quarter of the world's phosphate needs and three-quarters of US domestic needs. Florida ranked second nationally in production and fourth in consumption of crushed stone (limestone and dolostones), and we are in the top five in the production of Portland cement and peat; and first in the production of masonry cement. We rank 15th in sand and gravel used or produced, and continue to lead the nation in heavy minerals and fuller's earth production. Florida also produces significant amounts of kaolin, common clay, sand, fill material, and shell. Florida also produces Oil and Gas from the Cretaceous Sunniland trend in south Florida and from the Jurassic Smackover in NW Florida, near Jay. Dimension stone is no longer produced in Florida, however historically it was mined in the panhandle and on the east coast. Hard-rock phosphate also is no longer mined.

The paleoenvironmental and dynamic changes to our land surface in association with our overall and local climates are also the foundation of each and every unique ecosystem throughout the state. Understanding the geologic "reason" for the local ecosystem to exist as it does, and why the associated fauna / flora assemblage live where they do, enables our environmental restoration / conservation professionals their best chance to attempt land reclamation or mediation or to approach environmental / societal sustainability.

From our sandy white beaches to America's Everglades, Florida's coral reefs, springs, lakes and pristine wetlands draw millions of visitors to our state every year, which keeps our tourism based economy strong and growing. We are also strong in the agricultural arena with large parcels dedicated to citrus, vegetables, and other farm products. But generally, economic minerals or a need for competent professional geology to assist with natural resources conservation or environmental sustainability is not typically a visible component when environmental issues of importance to the public are discussed by our policy makers. Nevertheless, our state, located between the Gulf of Mexico and the Atlantic Ocean, our abundant springs, lakes, and wetlands, our vast amounts of groundwater, and our substantial amount of annual rainfall, make our peninsula a natural "hydrogeologic engine" as these processes continually modify and shape our water-dominated physiography, and support our ecosystems and unique environments. Florida has much to offer and challenge our geoscientists and interested geology students. And our professional geological community has much to offer our state and its citizens in return.



Earth Science Week October 12-18

see page 12 for
details of Earth
Science Week at
the FGS

Governor Appoints Five to the Board of Professional Geologists

On September 22, 2003, **Governor Bush** announced the reappointment of **Valerie R. Francisco** and **K. Dawn Blackledge** to the P. G. Board. New appointments announced were: **James W. Pease**, **Donald F. McNeill**, and **Stuart W. Smith**.

Hydrogeology Program



Since the last issue of the Forum, the FGS Hydrogeology Program (HP) has been very active in research, outreach and outsourcing. Research projects funded by the HP during the 2002-2003 fiscal year are complete, with many reports being prepared for FGS publication. Some of the projects include:

A CD for the Proceedings of the workshop “*Significance of Caves in Watershed Management and Protection in Florida*” was completed by Hazlett-Kincaid, Inc. These proceedings will soon be available on our web site, or you can order a CD from the FGS librarian, **Carol Armstrong**, at a cost of \$5.00. Her phone number is 850-487-9455 ext. 116.

Hazlett-Kincaid Inc. also submitted a report on dye tracing studies in the Woodville Karst Plain. This study was conducted in an effort to generate data on groundwater movement in karst for the ultimate purpose of developing a model to predict such movement. Other research on the Wakulla system is being led by **Dr. David Loper**, Florida State University (FSU) in a cooperative effort with the FGS and the DEP Springs Initiative Program. This project seeks to understand the dynamics of water flow in Wakulla Spring system and how it is influenced by interaction with surface waters. Flow meters have been purchased and will be installed in the spring’s conduits by divers for recording variations in flow and temperature. In the second phase of the study, wells will also be drilled directly into conduits using transponders purchased for the purpose. Power sources and tubing will be threaded through these wells to allow for continuous data recording and water-quality monitoring without the need for diving into these conduits. The first phase of this study is complete.

Drs. Tony Arnold and Bill Parker (FSU Department of Geological Sciences) conducted a study of the utility of foraminifera as indicators of environmental degradation or salinity changes in coastal waters. The first phase of the study focused on natural changes in salinity profiles; while the second phase focuses on foraminiferal responses to pollution.

Outsourcing for the 2003-2004 fiscal year includes projects in these focus areas:

- Assess the impact of aquifer storage and recovery on native microbial communities.
- Identify bacterial contamination sources in springs using genetic typing and culturing on bio-films.
- Quantify ground-water discharge into surface waters using radon, radium and seepage meters.
- Develop and hold a workshop to address scientific and regulatory issues associated with ASR projects in Florida.
- Continue dye-tracing studies in the Woodville Karst Plain and complete modeling of ground-water movement and contaminants transport in this karst setting.
- Explore new modeling techniques for the Florida Aquifer Vulnerability Assessment (FAVA) project using a combination of neural network and fuzzy logic modeling techniques.

- Use of Controlled Source Audio Magnetotelluric profiling (CSAMT) and Transient Electromagnetic (TEM) soundings to determine the depth of the top of underground sources of drinking water.
- Doran Consulting, Inc. was hired to assist in trend analysis of the quality of Florida's groundwater including springs water quality data.

The FGS is working with a group of hydrogeologists from around the state to make revisions to the hydrostratigraphic nomenclature in Special Publication 28 "Hydrogeological Units of Florida". Initial meeting of the Hydrostratigraphic Revisions Committee was held on August 13th.

Dr. Rick Copeland is providing technical assistance for the improvement of the groundwater portion of the Department of Environmental Protection's statewide water quality monitoring network also known as the "Status Network".

Additional reports have been completed in association with the HP research outsourcing program. **Mr. James McClean** and **Dr. Rodney DeHan** completed a report on the "*Evaluation of Remote Sensing Techniques for the Identification of Submarine Springs.*" This study was funded by a grant from NASA's Jet Propulsion Lab. The report has been delivered to and accepted by NASA in satisfaction of the grant requirements. The grant allowed the purchase of satellite scenes of areas of the Gulf of Mexico being studied for thermal signatures indicating discharge of ground water to surface waters of the Gulf as well as inland waters. A second report, titled "*Evaluation of Remote Sensing Methods for the Identification of areas of Ground Water Interaction with Surface Water*" has been completed by Dr. Rodney DeHan and Mr. James McClean. This report summarizes application of boat-towed resistivity and aerial thermography to identify groundwater inputs into surface water. Questions and additional details on the above should be directed to Dr. Rodney DeHan, FGS Hydrogeology Program. Dr. DeHan's phone number is 850-487-9455 ext. 150.

Springing Forth!

Springs research continues to be at the forefront in the HP. Land-use data collection continues as part of the Fanning Springs Nitrate Study. Not far away, conduit-monitoring wells have been installed at Manatee Springs. With valuable assistance from cave divers, radiolocation equipment was used to properly place the wells. FGS drillers installed three monitoring wells into the Main Tunnel, Blue Water Tunnel and Sewer Tunnel. Flow meters, data loggers and sampling tubes are to be installed in the near future to allow for real-time data collection as well as allow for water quality samples to be obtained without the need for cave diver support.

Other field studies confirmed several small ground-water discharges in the salt marsh and near shore along the Taylor County coast. These locations were prioritized based on analysis of satellite and thermography data collected to identify near-shore and offshore locations of fresh-water discharges. In support of the Springs Initiative, FGS staff obtained aerial photographs and video of Jackson Blue, Wakulla, Madison Blue, Manatee, Fanning, Ichetucknee, Homosassa, Rainbow, Silver, Alexander, Volusia Blue and Wekiwa Springs utilizing Florida Fish and Wildlife Conservation Commission helicopters.

Other HP Accomplishments:

Mike Miller developed a macro, for use in Microsoft Excel that calculates the median value when summarizing data by well ID. This macro was quite useful in the analysis of water level data accuracy and for the calculation of median values for the training points.

Alan Baker and **Jim Cichon** developed a SQL query aided in calculating median values for those data sets containing a large number of records (Excel has a limit of 65,000 records)

For more info on the Hydrogeology Program, please contact **Dr. Jon Arthur** at 850-487-9455 ext. 120

Hydrogeology Consortium :

Stemming from discussions at the Hydrogeology Consortium's Workshop, the FGS is working with the cave diving community to develop a glossary of terms. Hopefully, this glossary will increase communication and information exchange between divers and scientists as well as other interested individuals.

Getting the message out:

Outreach continues to be at the forefront of our activities as well. In addition to giving geology presentations at local schools, work continues on web-site development for a new map-based hydrogeology curriculum: "Explore Florida." Also, the HP was pleased to fund printing of an outreach poster developed by **Paulette Bond** (FGS) titled: "Land Use and Spring Protection." Another poster describing Florida's First Magnitude Springsheds is nearing completion and will be available as an educational and outreach tool.

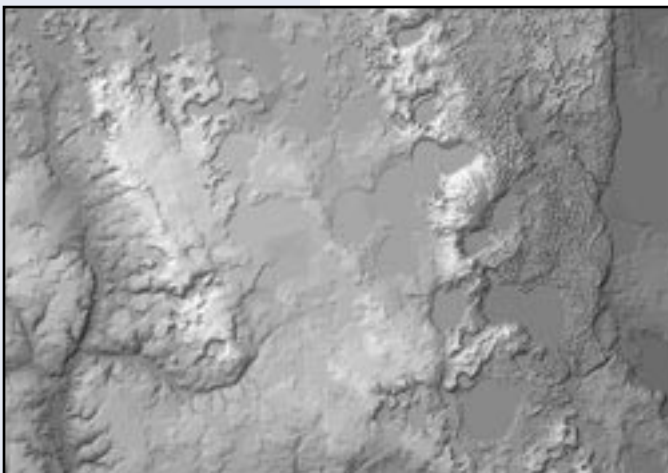
Speaking of springs, and outreach, the FGS is also pleased to announce completion of a 20 minute film "**Florida's Aquifer Adventure!**" which was funded by the Hydrogeology Program and produced by Sundance Film Festival Award Winner **Marc Singer** (Global Underwater Adventures) and Hazlett-Kincaid, Inc. The 20-minute film, soon to be available in VHS, describes Florida's aquifer systems, springs, caves, and environmental issues along with spectacular videography!

Florida Aquifer Vulnerability Assessment :

Topography

One of the key factors in modeling aquifer vulnerability is vertical distance. Therefore, accurate and detailed surface elevation data is required. Although Light Detection And Ranging (LIDAR) has become one of the most accurate methods for acquiring surface elevation data, it is expensive and currently recorded data does not exist on a state wide-level in Florida. The most accurate surface elevation data in Florida exists on USGS 1:24000 topographic maps. Contour lines for the peninsula were digitized from the paper maps in the late 1980s, but these lines were not edge matched between maps, and several erroneous elevation values like 999 and 777 existed. In order to produce a more accurate Digital Elevation Model, the FGS acquired the line datasets for all 850 USGS quadrangles in the Peninsula

(the remaining 214 quadrangles are being digitized by DEP's Division of Water Resources). These contour lines were visually checked against the paper maps for elevation accuracy, repositioned to improve horizontal accuracy, and edge matched between maps to create a continuous surface. Currently the line dataset is being checked for discrepancies such as line intersections (some too small to detect visually). Once the contour lines are cleared of all errors, they can be used to interpolate a Digital Elevation Model (DEM). A secondary output of this undertaking will be a dataset of depression features. The hachured lines from the USGS topographic maps, which identify depressions, were coded with a special value. These lines can then be converted into polygons and used to map possible karst areas.



Example of surface relief interpolated from USGS 1:24000 Topographic Map contour lines.

Development of a statewide estimate of the Surficial

Aquifer System (SAS) water table is currently underway. Using rivers, lakes and groundwater level data a terrain following model that utilizes multiple linear regression equations can be created. Groundwater level data was provided by the five Water Management Districts and the Department of Environmental Protection. To ensure the accuracy of the well data, the Florida Aquifer Vulnerability Assessment (FAVA) team checked over four million water level records. This analysis consisted of calculating the median, average, minimum value and maximum value for each well. By identifying major differences in these calculations, the FAVA team was able to delete or correct water level records. Completion of this model will coincide with the completion of the topographic contour line project.

With the completion of the data layers (DEM, IAS/ICU, karst, SAS depth to water), the modeling of Florida's aquifer systems on a statewide scale will begin. In preparation for the statewide model, FAVA members are examining additional training point data (a well that exceeds a certain level of contamination). The VISA (Very Intense Study Area) network may be added statewide while fecal coliform may be incorporated as a contaminant for the surficial aquifer system. The current FAVA pilot models use nitrate as a contaminant.



Geologic Data Acquisition Program

The Geologic Data Acquisition Program has undergone several recent changes. Personnel have moved into office space at the DEP Warehouse relieving some of the crowding at the Gunter Building. Additional, much needed core storage space has been acquired in the warehouse for the FGS Geologic Sample Library. A new sample preparation lab (well cuttings delivery, washing, drying, bagging and labeling) will be incorporated into this space as well as a core layout room for fresh core drying and/or examination of samples. A 1785 square foot drilling operations "barn" consisting of an enclosed workshop/storage area and dry storage for equipment, drilling mud and monitor well supplies, was built at the DEP Warehouse.



1785 square foot drilling operations "barn".

The move locates the programs personnel in the same facility where the drilling equipment is stored/maintained and where samples are processed and archived. Incorporating the sample preparation lab into the warehouse facility will allow samples to be delivered to the loading dock, all preparation work to be done and for the samples to be shelved without leaving the building.

Coastal Research Program

The Coastal Research Program has entered into the second year of a five year program designed to assess available potential sand resources off Florida's east coast beaches. The research has included the vibracoring of sites offshore of Duval and Nassau Counties. The FGS has been

FGS personnel deploying vibracoring assembly off the stern of the R/V GeoQuest





in close cooperation with the United States Army Corps of Engineers (USACE) during the core site selection process in order to complement the USACE's preparations for the Jacksonville Beach Renourishment Project projected to occur in 2005. To investigate the sand resources necessary to support that project we engaged the services of a consultant, Athena Technologies Inc. Athena, under the supervision of FGS personnel, has collected 45 cores in the southern two thirds of Duval County. An additional 12 to 15 cores located off northern Duval and Nassau Counties are currently being collected utilizing FGS personnel and equipment.

Athena technologies Inc. recovering a vibracore off Duval County.

Oil and Gas Update

Staff News

The Oil and Gas Section has welcomed three new employees in 2003. **Joel Webb** designs database systems for the Section's new well database. Joel has degrees in economics and management information systems. **Brett Cimbor** is completing his meteorology degree at FSU while helping to build the new oil and gas database. **John Leccese** joins our Jay Field Office as a well inspector. John has 31 years of oil industry experience.

Drilling Action: One drilling permit was approved on April 25, 2003 for a wildcat well in Okaloosa County, approximately 30 miles southeast of established production in the Jay area. The Duggan #34-2 well was drilled during May and June to a Smackover Formation target at a vertical depth of approximately 15,500 feet. Downhole geophysical logging tests indicated no oil or gas. Had the well been successful, Zinke & Trumbo intended to drill additional targets in the Crestview area. The company has three additional drilling applications on file, but having drilled a dry hole, the company may abandon its prospecting efforts in Florida.

Consent Order: Two northwest Florida fields, McLellan and Blackjack Creek, have been shut-in due to water cuts in the 97% to 99% range. Petro Operating Company is attempting to restart production at Blackjack Creek using an acid gas reinjection technique which may reduce costs enough to restore production. But before the company will be allowed to operate the field, well and plant violations must be corrected. Last year the Oil & Gas Section ordered Petro to keep all 24 wells at Blackjack Creek shut-in until all violations were formally addressed. On July 29, 2003 the company entered into a Consent Order with the Department of Environmental Protection. The consent order was a cooperative effort between the Florida Geological Survey and the Department's Air, Hazardous Waste, and Storage Tank District Offices in Pensacola. Blackjack Creek Field has produced 58 million barrels of crude oil and 61 billion cubic feet of gas since 1972.

Geophysical Action: Mayne & Mertz, Inc. applied during June for a permit to conduct a major 3-D seismic survey in the Jay area. The proposed survey will collect seismic reflection/refraction data to be used for constructing geologic structural and stratigraphic models. The energy source will be explosives detonated in shallow wells. The energy receivers will be spike-mounted geophones.

Approximately 85% of the survey will be conducted in Alabama. The portion of the survey in Florida will consist of approximately 13 square miles in Escambia

Oil and Gas Production Update

County and one square mile in Santa Rosa County. Drilling and water supply equipment will be mounted on specialized vehicles. The permittee will keep vehicles on existing roads in the wetlands areas in the vicinity of the Escambia River. Cables and geophones will be ferried by helicopters and ground vehicles, but will only be installed by hand. Some drilling operations will be conducted in wetland areas under a separate wetlands permit using alternative low impact drilling vehicles.

The general area of the proposed seismic operation has previously been subjected to impacts from drilling and seismic surveying. Approximately 350 deep oil and gas wells, and seismic surveys numbering in the hundreds have been concentrated in the northern portions of Escambia and Santa Rosa Counties since 1970. The proposed survey area also overlaps Jay Field which has been heavily impacted by crude oil and natural gas production facilities including pipelines, fluid separation plants, roads for exceptionally heavy vehicles, and 120 currently active production, injection, and disposal wells. The applicant has submitted a copy of its agreement with Exxon Mobil Corporation to conduct geophysical operations within Jay Field.

South Florida Action: There were no new wells in southwest Florida, but Peninsular Oil Company attempted two sidetracks from an existing well in Corkscrew Field. Both were dry holes. Calumet Florida, Inc. plugged and abandoned 2 wells in Bear Island Field, completing a two-year program to plug 20 shut in wells in several fields.

Gas Storage: Inquiries have been presented by a south Florida oil producer regarding conversion of shut in oil and gas fields to storage facilities for imported natural gas. Rulemaking is currently being considered to accommodate these requests. If these proposals are ultimately implemented, the availability of natural gas in south Florida will be greatly enhanced and the multibillion dollar 36-inch diameter Gulfstream Pipeline, which crosses the Gulf of Mexico from Alabama, will be able to operate at full capacity. Gas storage fields in south Florida may also improve the economic incentives for proposed additional natural gas pipelines from the Bahamas.

Remedial Plugging Program: During the spring of 2003 Oil and Gas Section staff managed a contracted project to conduct remedial plugging and abandonment of five Levy County wells which had exhibited artesian flow. These wells, which were originally plugged between 1946 and 1954, were unsuccessful oil and gas exploratory wells and were selected for remedial plugging in cooperation with the Suwannee River Water Management District. Four additional wells, selected for their potential as sources of groundwater contamination, have been targeted for replugging next year.

During the period of July 2002 to June 2003 approximately 3.4 million barrels of crude oil and 3.3 billion cubic feet of natural gas were produced in Florida. These figures represent reductions of 15% in oil production and 38% in gas production as compared to last year, and signal the state's largest production decrease since the mid-1980's. On June 30, 2003 the state's cumulative production totals reached approximately 590 million barrels of oil and 623 billion cubic feet of gas. In 1978 Florida's annual petroleum production rate peaked at 48 million barrels of oil and 52 billion cubic feet of gas, which ranked Florida 8th among oil producing states. Since 1945 the state has received 1376 drilling permit applications, of which 253 wells were never drilled, 716 were dry holes, and 347 became producers. The state currently has 209 permitted wells operating within 8 active oil and gas fields. Eleven formerly producing fields have been permanently plugged and abandoned and 2 fields are currently shut-in.

News from the Florida Association of Professional Geologists

On August 27, 2003, the Florida Association of Professional Geologists (FAPG) hosted a Professional Geologist legislative summit in Tallahassee, Fl. During the summit, the FAPG Executive Committee (EC) sought the input of members to help determine the steps the association would take toward its legislative and financial goals in the coming year. The legislative goals include The Water Resources Act (WRA), The Consultants Competitive Act (CCNA), The Florida State Professional Geology Act (PGA), and The Florida Geologist in Training (GIT) Act. If you're not already familiar with these issues, please go to the website (www.FAPG.org). Those who attended the summit agreed that these issues are critical to the professional geologists of Florida, and these issues were formally adopted as the FAPG's legislative goals for the coming year.

Earth Science Week



October 12-18 is Earth Science Week (ESW), a national event initiated and sponsored by the American Geological Institute to raise public awareness of the earth sciences and their role in our daily lives. The theme for this year's event is "Eyes on Planet Earth: Monitoring our Changing World." In celebration of ESW the FGS is hosting its annual Open-House on Wednesday, October 15 from 10:00 am to 4:00 PM at the Gunter Building on the campus of Florida State University. The local home schooling community will be invited as well as the general public. The Open-House will feature building tours and various interactive activities. FGS staff members will also give talks in local middle schools on earth science topics during ESW. Information about nationwide Earth Science Week events and contests for students can be found at: www.earthsciweek.org. The FGS will also highlight program information and interactive activities at Innovation Park's Family Fun Day on October 18.

For more information on Earth Science Week go to the FGS website at:

www.dep.state.fl.us/geology

Several events are planned around the state of Florida to mark ESW. Florida International University sponsors an internet based contest, Know Your Planet for high school students and teachers. Visit www.fiu.edu/orgs/geology for details. The United States Geological Survey (USGS) is sponsoring an open house for local fourth grade students and the general public at their Center for Coastal and Watershed Studies in St. Petersburg on October 23 and 24. For more information visit: <http://coastal.er.usgs.gov/openhouse2003.html>. Geology classes at Broward Community College are planning a field trip to the Spruce Pine area of North Carolina (October 23-26). The Tallahassee office of the USGS will mark Earth Science Week with demonstrations of their interactive groundwater model and field equipment at Family Fun Day, October 18 at Innovation Park in Tallahassee. They will also have educational materials and technical publications available for distribution.

Lake Jackson Update

"What is happening with Lake Jackson?" This is a frequently asked question fielded by FGS geologists. As most of you remember, Lake Jackson, a 4,000+



Lake Jackson early to mid 2000

acre karst basin lake located in northern Leon County, went dry in 1999 when Porter Hole Sink opened and swallowed what remained of the drought reduced lake. Now, four years later, the lake has not returned to its normal stage despite slightly higher than average rainfall. What's happening?

The short answer is geologists are not sure why the lake has not risen back to its normal level.

The sinkhole is thought to

still be taking six to ten million gallons of water per day. However, this is not enough of a water loss to explain the lake's response. Discussions among various area geologists have yielded several possibilities: 1) the sink has changed and is taking a significantly larger amount of water than was previously measured; 2) another sink or sinks have opened; 3) nature is simply taking her time in refilling the lake after a long drought; and/or 4) the removal of "muck" during the lake restoration now allows for more infiltration of water through the lake bottom. None of these ideas have been tested, checked or verified. FGS geologists and other area scientists are looking further into what is occurring at Lake Jackson.



Lake Jackson August 2003

FGS Cooperative Training

Staff from the Survey, together with the Leon Advocacy and Resource Center (LARC) and the Leon County School system (LCS) has teamed up to provide job training to area high school students with special needs. The program provides these students with the opportunity to experience different types of entry level jobs in many different fields like nursing, office/clerical, landscape maintenance and the computer field. Ultimately, the students will find a field of employment that they would like to pursue after graduation.

The program is dependent upon community based instruction to provide the training opportunities. The Florida Geological Survey has teamed up with the LCS and LARC to enable the students to learn certain computer related tasks. The students, who are assisted by LARC and LCS job coaches, worked on a voluntary basis for approximately two hours a day, two to three times per week. At the FGS the students are currently scanning paper well logs into Adobe .pdf files which will later be incorporated into electronic books. Currently, the students have scanned over 3,000 FGS documents. The Survey's County well log database, which contains thousands of logs collected over approximately seventy-five years, is currently maintained in hard copy format.



Students from left to right Kendra, Brandon, Twanna, Twanna

The instructors that accompanied the students were **JoAnne Fraiser** (LARC)

continued next page

and **Julie Orange** (LCS). **Jim Barnard** (LCS) coordinated the program with FGS staff **Steve Spencer** and **Paula Polson**.

Florida Sheriff's Youth Ranch Teachers Visit FGS

In early May four teachers from [Youth Camp-Barberville](#) and [Caruth Camp-Inggris/Yankeetown](#), part of the Florida Sheriffs Youth Ranches, toured the FGS facilities on the FSU campus. The two youth camp locations provide a positive camping experience for many of Florida's needy and deserving boys and girls. Canoeing, archery, swimming, horseback riding, and many other recreational activities allow them the opportunity to build basic teamwork and peer communication skills. The teachers plan to incorporate earth science into the camps' outdoor education programs.

During their visit, Walt Schmidt provided the group with a basic overview of the FGS mission and programs. Ron Hoenstine and Dan Phelps described the Coastal Research Program projects, and Alex Wood and Tom Greenhalgh presented summaries of on-going Hyrogeology Program studies. Tom Scott then invited the group into his "museum" office, where they were quite impressed with his vast collection of Florida rocks, fossils and other curiosities collected during some thirty years of research throughout the state. The teachers enjoyed their tour, and departed the FGS bearing educational posters and publications for use in their new program.

Tallahassee Museum of History and Natural Science



An article by FGS geologist **Frank Rupert** was printed in the August edition of the Tallahassee Museum of History and Natural Science Newsletter.

The Article was written to inform readers about a new fossil dig display at the museum which provides visitors with a hands-on exploration of one moment in Florida's geologic past. Featured in the exhibit are fossil-laden boulders of a rock called the Torreya Formation. These limestone boulders preserve a chronicle of the ancient environment of a time long ago.

In the article Frank Rupert explains Florida's early geologic history up to the Early Miocene Epoch which was the time that the Torreya Formation was created. Also explained was how the Torreya formation was formed and the type of fossils commonly found in these rocks.

With the information presented in the article that visitor to the display will better understand and appreciate the fascinating series of geologic events leading to the rock's formation.

Employee Graduation

FGS employee, **Jacqueline M. Lloyd**, graduated from the Florida State University, Florida Center for Public Managers, Certified Public Manager (CPM) program on June 13, 2003. The CPM program is a nationally-recognized, comprehensive training and development program for public sector managers at all levels of state and local government. The program aims to professionalize the practice of public management, in much the same way that other professionals (such as CPAs) have organized themselves. Today, many public agencies are moving away from traditional management and embracing transformational leadership. The CPM program incorporates state-of-the-art theory with practical applications. The vision of the CPM program is to create reflective practitioners who apply advanced managerial techniques to real-world problems, and to foster learning organizations that use new knowledge to improve the way they govern.



Left to right Howard Rasmussen, Director, Florida Center for Public Management, Florida State University; Jacqueline Lloyd, and Mike Joyner, DEP Chief of Staff.

DEP Employee of the Month

Paula Polson, FGS Environmental Specialist I, was named September DEP Employee of the Month. Paula's position title doesn't begin to capture her contribution to the FGS and DEP. Paula is one of the Department's "behind-the-scenes" dedicated, hardworking, competent professionals that does exceptional work but only considers she is "doing her job." Paula's professionalism, willingness to assist fellow employees, unselfish and unpretentious manner and her ever present pleasant attitude create a positive cohesiveness within the FGS. Paula joined the DEP in 1998, mainly working with AutoCAD software. She quickly became indispensable by virtue of her technical expertise, superior work ethic, problem solving ability, and willingness to share her knowledge.

She designs and edits the *Florida Geology Forum*, which has become a truly professional newsletter under her stewardship. Paula learned Adobe software to prepare FGS publications and also volunteered to become the FGS Webmaster. She attended Webmaster training and maintains an outstanding website.

In addition to her creative, dedicated work for DEP, Paula enjoys "playing" with 3D animation software, working out, and gardening.



Mineral Rights

continued from page 3

2. Right to profits

Split Ownership

It often happens that the mineral estate is owned by more than one person; sometimes many individuals may be involved. For instance, if the surface owner also owns a percentage of the subsurface rights, i.e., the minerals, then the surface owner and subsurface owner would share the mineral ownership. The right to a share of the profits from the sale of the minerals comes about only from the ownership of the subsurface rights regardless of the number or owners.

**New Publications at
the FGS**

Poster 9 -- Florida's
Industrial Minerals:
Making Modern Life
Possible, 2003, by
Steve Spencer and
Frank Rupert.

Poster 10 -- Land Use
and Spring Protec-
tion, 2003, by **Paulette
Bond**.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL
PROTECTION

JEB BUSH, GOVERNOR
DAVID B. STRUHS, SECRETARY

FLORIDA GEOLOGICAL SURVEY
WALTER SCHMIDT, STATE GEOLOGIST

FLORIDA GEOLOGY FORUM
DESIGNER/EDITOR, **PAULA POLSON**

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