June 2024
Volume XXXII, Issue 6

The Florida Surveyor

IN THIS ISSUE

69th ANNUAL CONFERENCE
Schedule, Seminars, Events, Exhibitors, and Sponsors

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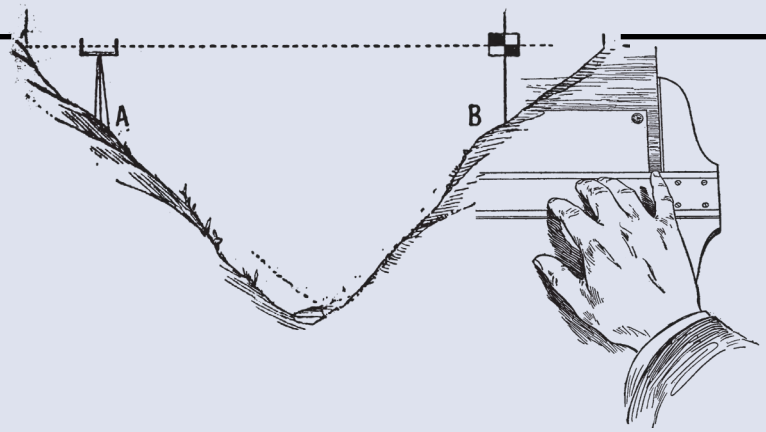

THE FLORIDA SURVEYOR is the official publication of the Florida Surveying and Mapping Society, also known as FSMS. It is published monthly for the purpose of communicating with the professional surveying community and related professions who are members of FSMS. Our award winning publication informs members eleven months out of the year about national, state, and district events and accomplishments, as well as articles relevant to the surveying profession. In addition, continuing educational courses are also available.

PRESIDENT'S Message

June 14th, 2024

Dear FSMS Members,

We are preparing for the 2024 Annual Conference in Orlando. My term will end at the completion of the Conference. I would like to thank you for allowing me the opportunity and honor to serve as president of the Florida Surveying and Mapping Society. The Society has had a great year.

We were blessed to have a good outcome of the threat to our profession. However, that fight is not over. We have to continue to be diligent to guard our professions. It is a shame that we cannot debate the merits of our profession, it has to be handled through politics.

We are blessed to have a great organization and great volunteers to fuel it. An organization is only as strong as its membership and volunteers.

"*The role of most leaders is to get the people to think more of the leader, but the role of the exceptional leader is to get the people to think more of themselves.*" — Booker T. Washington

Respectfully submitted.

Howard J. Ehmke II

President
Howard Ehmke
(561) 360-8883
Howard@GCYinc.com

Topgolf Orlando

Thursday 07/25/24 11:00 am - 2:30 pm

Green Wristband Required

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Location:

9295 Universal Blvd.
Orlando, FL

Cost: $120/person / Individual Play

Lunch provided in Signature Room 11 - 12

Transportation on your own

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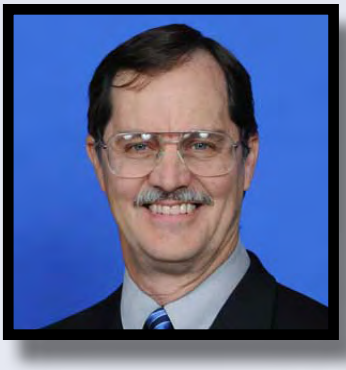
2023-24 FSMS Officers



President-Elect

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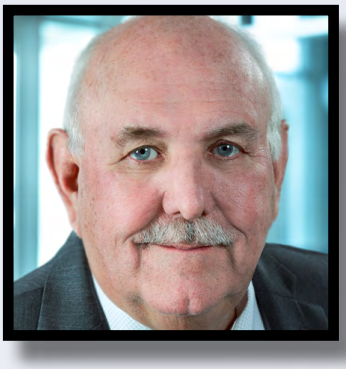

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Immediate Past President

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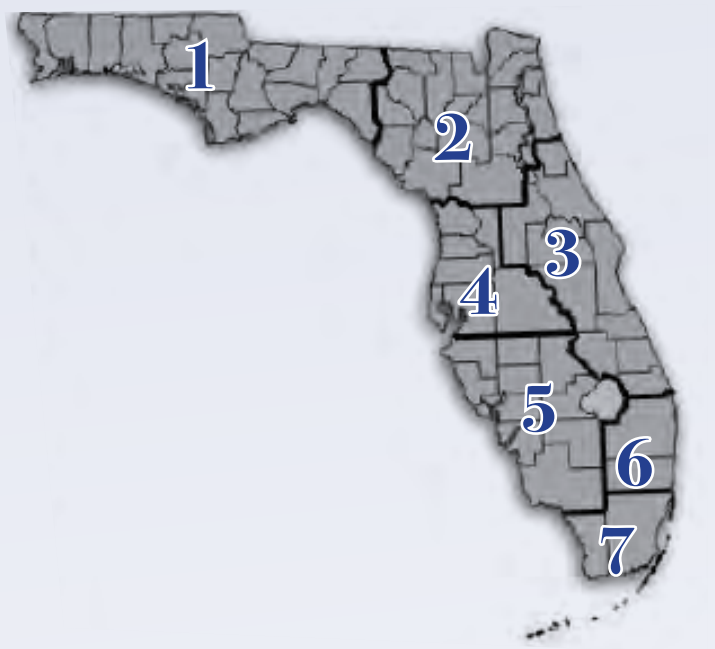
2023-24 Districts and Directors



District 1 - Northwest

Bay, Calhoun, Escambia, Franklin, Gadsden, Gulf, Holmes, Jackson, Jefferson, Leon, Liberty, Madison, Okaloosa, Santa Rosa, Taylor, Wakulla, Walton, Washington

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2023-24 Committees

Standing Committees	
Nominating Committee	Rick Pryce
Membership Committee	Nick DiGruttolo
Finance Committee	Bon Dewitt
Ethics Committee	Shane Christy
Education Committee	Greg Prather
Constitution & Resolution Advisory Committee	Angela Bailey
Annual Meeting Committee	Allen Nobles
Legal & Legislative Committee	Jack Breed
Surveying & Mapping Council	Randy Tompkins
Strategic Planning Committee	Rick Pryce
Executive Committee	Howard Ehmke

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Awards Committee	Lou Campanile, Jr.
UF Alumni Recruiting Committee	Russell Hyatt
Professional Practice Committee	Lou Campanile, Jr.
Workforce Development Committee	Allen Nobles

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CST Program	Alex Jenkins
FDACS BPSM	Don Elder
Surveyors in Government	Richard Allen
Academic Advisory UF	Justin Thomas
FES	Lou Campanile, Jr.

Practice Sections	
Geospatial Users Group	Earl Soeder
Young Surveyors Network	Melissa A. Padilla Cintron, SIT

Around the State

TopoDOT Users Conference 2024

FSMS Southeast Director Earl Soeder, PSM doing an outstanding job of representing the society and answering questions about the surveying and mapping profession.

Palm Beach Chapter Meeting & "Surveyors for SEALs" Memorial Day Fundraiser

From Todd Bates, PSM & Palm Beach Chapter President: The 1st annual Palm Beach "Surveyors for SEALs" Memorial Day Fundraiser was a SUCCESS. Special thanks to Dr. Youssef Omar Kaddoura for an incredible presentation and all the FSMS chapters who contributed to this fundraising initiative for the The National Navy UDT-SEAL Museum and Trident House Charities. Sponsorships came in from all around Florida. NW Florida Chapter, Broward Chapter and Miami-Dade Chapter.

Broward May Chapter Meeting:

From Dr. Youssef Kaddoura (Geomatics Specialist at UF Geomatics Sciences):

Many thanks to Frank J. Hahnel, III, for his enlightening presentation on 'SLAM SCANNING IN THE GEOMATICS WORLD' during our FSMS Broward Chapter May 2024 monthly meeting.

Your insights into Laser Scanning in surveying were immensely valuable. We deeply appreciate the hands-on experience with the scanner and witnessing firsthand its ease of use and user-friendliness.

SIT Prep—Geoscholar's Florida Surveying and Mapping Society Fundamentals of Surveying (FS) Exam Prep Course 7/24/24 from 8 am - 4 pm

Un-Licensed Attendees — No CECs

This (FS) Exam Prep Course will be offered at our annual conference and is taught by Dr. Stacey Lyle, PhD, RPLS, PLS. This course provides critical information needed to obtain a Surveyor in Training (SIT) Certificate based upon topics tested on the NCEES Fundamentals of Surveying (FS) exam. The course offers an in-person FS review during the annual FSMS Conference, as well as 1 year access to our online preparation course.

Conference Schedule 2024

Wednesday, July 24

7:00am - 5:00pm	Conference Registration Desk Open	*Majestic Foyer*
7:30am - 8:00am	Seminar Sign-In	*Seminar Room*
8:00am - 1:00pm	Golf Tournament	*Shingle Creek*
8:00am - 5:00pm	BPSM Meeting	*Citrus AB*
8:00am - 6:00pm	BBQ Teams Cooking	*Parking Lot*
8:00am - 3:00pm	**Seminar I** **Riparian Rights Surveying** Course #10807- 6 CEC Hours Panel - Moderator: Richard Green, Esq.	*Majestic 3*
8:00am - 3:00pm	**Seminar II** **Mock Trial - A Boundary Dispute Case** Course #10808 - 6 CEC Hours Instructor: Jeffery Lucas,JD, PLS, Esq	*Majestic 6*
8:00am - 4:00pm	**SIT Course (1-Day Course)** **Fundamentals of Surveying (FS)/SITExam Prep** Instructor: Dr. StaceyLyle, PhD, RPLS, PLS	*Diamond 4*
10:00am - 10:15am	Seminar Break (All seminars)	*Majestic Foyer*
11:30am - 1:00pm	Lunch on your own	
3:00pm - 3:15pm	Seminar Break (Stacey Lyle SIT course)	*Majestic Foyer*
3:30pm - 4:30pm	Surveying & Mapping Council	*Diamond 2*
4:30pm - 5:00pm	Executive Committee Meeting	*Sago*
6:00pm - 8:00pm	Welcome BBQ Dinner (“Wednesday” wristband)	*Royal 1 - 2*
8:00pm- 10:00pm	Cornhole Tournament (Sign up - Registration Desk)	*Royal 1 - 2*

Thursday, July 25

7:00am - 5:00pm	Conference Registration Desk Open	*Majestic Foyer*
7:30am - 8:00am	Seminar Sign-In	*Seminar Room*
8:00am - 10:45am	**Seminar I** **The Historical Cartography of Florida** Course #10809- 3 CEC Hours Instructor: Dr. Joe Knetsch, PhD	*Majestic 3*
8:00am - 10:45am	**Seminar II** **Impact of NGS 2022 DATUM & Low Distortion Projections to Mapping & Engineering Projects** Course #10810 - 3 CEC Hours Instructor: Vas Kalogirou, RPLS,PLS,PS,PSM,LS	*Majestic 6*
8:00am - 3:00pm	Exhibitor / Vendor Booth Setup	*Majestic Ballroom*
11:00am - 2:30pm	Topgolf (Green Wristband Required) / Box Lunch	*Off Site*
11:30am - 1:00pm	Lunch On Your Own	
4:00pm - 4:30pm	Exhibit Hall Grand Opening / Ribbon Cutting	*Majestic Ballroom*
4:30pm - 6:00pm	Exhibitor Reception (Attendee Name Badge REQUIRED)	*Majestic Ballroom*
6:00pm - 8:00pm	Legislative Reception (American Flag Wristband)	*Sabal Boardroom*
8:00pm - 11:59pm	Casino Night	*Majestic Foyer*

Friday, July 26

7:00am - 5:00pm	Conference Registration Desk Open	*Majestic Foyer*
8:00am - 8:45am	Exhibit Hall Breakfast (Purple Wristband Required)	*Majestic Ballroom*
8:00am - 4:00pm	Exhibit Hall Open (Open to all)	*Majestic Ballroom*
8:30am - 9:00am	General Business Session Sign-In	*Majestic 6*
9:00am - 12:00pm	General Business Session	*Majestic 6*
12:00pm - 1:30pm	Exhibitor Luncheon (“Admit One” Wristband Required)	*Majestic Ballroom*
2:00pm - 2:30pm	Geospatial Users Group	*Majestic 6*
2:30pm - 3:30pm	NSPS Meeting	*Diamond 1*
2:30pm - 4:30pm	FDOT Town Hall / Surveyors in Govt. (Open to all)	*Majestic 6*
5:00pm - 6:00pm	Young Surveyors Network Event	*Majestic 3*
6:30pm - 7:00pm	Cocktail Reception	*Majestic Foyer*
7:00pm - 10:00pm	Recognition Banquet (VIP or Smiley Face (Child) Wristband)	*Majestic 3 & 6*
10:00pm - 11:00pm	President’s Reception	*Majestic Foyer*

Conference Schedule 2024

Saturday, July 27

7:00am - 12:00pm	Conference Registration Desk Open	*Majestic Foyer*
8:00am - 8:30am	Seminar Sign-In	*Seminar Room*
8:00am - 12:00pm	CST Exam (Certified Survey Technician)	*Diamond 1*
Saturday Seminars	**Registration Required**	
8:30am - 3:30pm	**All Day Session** **Surveying the Infrastructure of GIS** Course #10815 - 6 CEC Hours Panel Discussion	*Majestic 1*
8:30am - 10:10am	**Morning Segments** **Boundary Litigation and the Surveyor** Course #10816 - 2 CEC Hours Instructor: Knud Hermansen, PLS, PE, PhD, Esq.	*Majestic 2*
	Filling Available Survey Positions with Technology Course #10867 - 2 CEC Hours Instructor: Robert Martin, PS	*Majestic 3*
	Retracement of the Initial Baseline Survey for Florida Course #10818 - 2 CEC Hours Instructor: Allen Nobles, PSM	*Majestic 4*
10:10am - 10:30am	Morning Break (All Sessions)	*Majestic Foyer*
10:10am - 10:30am	Seminar Sign-In	*Seminar Room*
10:30am - 12:10pm	**Mid-Morning Segments** **Surveying Railroad Corridors with Respect to Property** Course #10819 - 2 CEC Hours Instructor: Leslie Odom, PSM	*Majestic 2*
	AI Unleashed - Surveyor's Dream or Nightmare Course #10820 - 2 CEC Hours Instructor: Dr. Youseff Kaddoura, PhD	*Majestic 3*
	An Introduction to Leveraging Remote Sensing and Surveying Practices for Design-Grade Survey Projects Course #10821 - 2 CEC Hours Instructors: Michael Zoltek, LS, CP, CFedS, GISP, PMP Jeffrey Young, PSM, CP, PPS, SP	*Majestic 4*
12:10pm - 1:30pm	Lunch (On your own)	
1:00pm - 1:30pm	Seminar Sign-In	*Seminar Room*
1:30pm - 3:00pm	**Afternoon Segments** **Tidal Datums and Property Boundaries** Course #10822 - 2 CEC Hours Instructors: Nick DiGruttolo, PSM, PhD / Martin Britt, PSM	*Majestic 2*
	Emerging Technology for Data Collection Course #10823 - 2 CEC Hours Instructor: Adam Long, PE,PS	*Majestic 3*
	The Role of Title in the Government Land Acquisition Due Diligence Process Course #10824 - 2 CEC Hours Instructor: Wendi McAleese	*Majestic 4*
3:15pm - 5:00pm	Board Meeting	*Diamond 2*

Conference Seminars

Wednesday - July 24

8:00 am - 3:00 pm

Riparian Rights Surveying (6 CECs - Course #10807)
Panel Discussion (6 speakers) - Moderator: Richard P. Green, Esq.
Florida Bar CLE's: Course Reference Number: 2403461N

This course will provide a history of riparian rights in Florida and the role of the Florida Department of Environmental Protection. From this foundation the course will detail a "nuts and bolts" of riparian rights surveying including techniques, standards, methodology, and emerging technologies. Surveyors will be equipped with the basics for performing a riparian rights survey along any waterbody where riparian rights are applicable.

Richard P. Green, Esq. is Senior Attorney at the St. Petersburg office of Lewis, Longman & Walker, P.A. He has extensive litigation experience in a variety of areas such as real property, commercial, riparian rights, and environmental matters. He represents various public and private entities in litigation in both federal, state, and administrative forums. Green was included in Tampa Magazine's 2024 Top Lawyers List in the areas of Administrative/Regulatory Law and Environmental Litigation, the 2024 Best Lawyers in America "Ones to Watch List" for Environmental Litigation and Real Estate Law, and Rising Star by Florida Super Lawyers, a peer designation awarded to only 2.5% of Florida lawyers, since 2020.

Panelists:

Andrew J. Baumann, Esq.
James C. Weed, PLS
George "Chappy" Young, Jr, PSM
Richard Malloy, PSM
Scott Woolam, PSM

Choose one 6-hour seminar for Wednesday

A Mock Trial - A Boundary Dispute Case - Based in part on the case of Dowdell v. Cotham
(6 CECs - Course #10808) Instructor: Jeffery N. Lucas, JD, PLS, Esq.

This mock trial is loosely based on the case of Dowdell v. Cotham, a case involving neighbors who for over 20 years lived in happy-peaceful-coexistence, until one of the neighbors hired a surveyor to survey his property. After that—well—let's just say that things were never the same. This seminar will explore the world of civil litigation through a mock trial based on a real-life boundary dispute case. Through audience participation, volunteers will play the roles of attorneys, landowners, lay witnesses and expert land surveyor witnesses; the seminar leader plays the role of judge. The remainder of the audience will be divided into jury pools, each with a foreman spokesperson. The size and number of juries will be determined by the size of the remaining audience. The trial will be held, and the juries will deliberate. Following deliberation, each jury will then render their verdict, and discuss their reasoning. This seminar is designed to demystify the litigation process and explain the rules of engagement that will be used in court.

Jeffery N. Lucas, JD, PLS, Esq. is a licensed land surveyor in Alabama, Florida, Georgia, Mississippi and Tennessee. He is also a licensed attorney in the State of Alabama. Jeff is a recognized expert in land boundary law, riparian rights, and land surveying liability issues. He has practiced land surveying throughout the five southeastern states in which he is licensed. Jeff is also an author, columnist, lecturer and seminar presenter. He has authored three books on surveying, has over 100 nationally published articles and over 30 titles in his seminar library. Jeff has presented continuing education seminars at conferences from Alaska to Florida, from California to Nova Scotia, and most places in between.

SIT Prep
8:00 am - 4:00 pm

Geoscholar's Florida Surveying and Mapping Society Fundamentals of Surveying (FS) Exam Prep Course
Un-Licensed Attendees - No CEC Credit - Dr. Stacey Lyle, PhD, RPLS, PLS

Geoscholar's Florida Surveying and Mapping Society Fundamentals of Surveying (FS) Exam Prep Course is designed to provide critical information needed to obtain a Surveyor in Training (SIT) Certificate based upon topics tested on the NCEES Fundamentals of Surveying (FS) exam. The course offers an in-person FS review during the annual Florida Surveying and Mapping Society Conference, as well as an online preparation course.

You must complete the online course before attending the Seminar. Dr. Lyle will be covering select questions over the required sections to help you with examination preparation. After the Seminar you will have access for 1 year to the online course.

Dr. Stacey Lyle, PhD, RPLS, PLS is an Associate Professor of Practice at Texas A&M University's Zachry Department of Civil and Environmental Engineering and Department of Geography. He has served as an expert witness on land boundary court cases. He is active in the industry with over 35 years of surveying experience including civil engineering, land surveying, cadastral land records databases, GIS/CAD/BIM Fusion, geodesy, hydrography, photogrammetry, and cartography.

Conference Seminars

Thursday - July 25

8:00 am - 10:45 am

The Historical Cartography of Florida
Course #10809 - 3 CECs
Dr. Joe Knetsch, PhD

The course is designed to facilitate the understanding of the early and current mapping of the State of Florida. Each age has had its differing purposes and various nations have contributed to the mapping of the land of Florida. From the earliest explorers to the current GIS systems, the maps of Florida have shown the changes in the land, the formations exposed or covered and the property lines of all individuals who claim to own the land. Each type of map, coast charts, property plats, etc. have their individual purposes and all need to understand that each map will show or highlight something different depending upon the use for which it is intended. This course will demonstrate that each map has its use and interpretation and it is important to understand these before committing a proper survey of the lands to be depicted.

Dr. Joe Knetsch, PhD received his PhD in history from Florida State University (1990), an MA in history from Florida Atlantic University (1974) and a BS from Western Michigan University with a major in History and Economics. He was the historian for the Florida Department of Environmental Protection (formerly Department of Natural Resources), Division of State Lands, from 1987 to August, 2014. He is the author of fourteen books (mostly on Florida History), over two hundred journal articles, forty book reviews, and over two hundred and twenty papers and presentations on Florida history. Dr. Knetsch is a member of numerous historical societies and associations. He currently resides in Tallahassee, Florida, with his wife of forty-five years, Linda. He also currently works as a consultant for the Town of Redington Beach, the State of Alabama, and other private interests.

Choose one 3-hour seminar for Thursday

Impact of NGS 2022 DATUM & Low Distortion Projections (LDPs) to Mapping & Engineering Projects
Course #10810 - 3 CECs
Vasileios "Vas" Kalogirou, RPLS, PLS, PS, PSM, LS

The National Geodetic Survey (NGS) is updating both the HORIZONTAL and VERTICAL DATUMS. The presentation will depict the impact of Surveying/Mapping, GIS and Engineering projects based on the design and configuration of the NEW State Plane Coordinate Systems (SPCSs) and the Low Distortion Projections (LDPs). The learning objectives of this presentation will be to have a better understanding of: The principles of the new NGS 2022 Datum & LDPs, The impact of the new DATUMs to various geographic regions after 2022, managing legacy, small-scale & large-scale projects before and after 2022.

Vasileios "Vas" Kalogirou, RPLS, PLS, PS, PSM, LS started his surveying career in Greece 30+ years ago through his surveying family business and is a third generation Surveyor. While working in the surveying industry he received a 5-year bachelor's degree in Land Surveying Engineering from the Aristotle University of Thessalonica, Greece in 2001. At the end of the same year he received his license as a Professional Land Surveyor in Greece and then moved to the United Kingdom where he received his master's degree in GIS in 2003. At the end of 2003 he served in the Greek Artillery where he continued working as a surveyor for various expeditions. Vas moved to Dallas, Texas in 2005 and started working for Halff, which is where he is still employed today as the VP, Survey Practice Leader. Throughout his career, Vas managed several TxDOT & ALTA Surveys, FEMA, USACE, Oil & Gas and Geospatial projects in various parts of Texas and other States. Vas is a Licensed Surveyor in seven (7) States, including the State of Florida. Since 2007 he has been coordinating the RPLS & SIT study groups while serving as the President of the Dallas TSPS Chapter 5 in 2021. Vas is also an adjunct professor teaching the courses of GIS and Geodetic Surveying & Mapping at Dallas County College since 2015 and currently serves as a Surveying Advisory Committee member on behalf of the Texas Board of Professional Engineers and Land Surveyors, but most importantly, he is a devoted family man who really enjoys surveying.

Conference Seminars

Saturday - July 27

8:30 am - 10:10 am

Boundary Litigation and the Surveyor
Course #10816 – 2 CECs
Knud Hermansen PLS, PE, PhD, Esq.

Many surveyors will be involved in boundary litigation as an expert witness. For those surveyors without experience as an expert witness, boundary litigation can be a stressful experience. Even surveyors with experience may wish to improve their testimony and be more credible and persuasive. This workshop will explain boundary litigation and the surveyor's role in litigating boundaries.

Knud Hermansen PLS, PE, PhD, Esq. is an attorney, professional engineer, and professional land surveyor. His education includes a Ph.D. in Civil Engineering from the Pennsylvania State University and a J.D. (Doctorate in Law) from West Virginia University. Knud has served as an expert witness, litigator, appellate counsel, arbitrator, mediator, boundary commissioner, member of a board of licensure, and surveying faculty member. Knud is a professor emeritus at the University of Maine. He operates a consulting firm offering surveying, engineering, and legal services. He is an author or co-author of numerous books and articles.

8:30 am - 10:10 am

Filling Available Survey Positions with Technology
Course #10867 – 2 CEC's
Robert Martin, PS

In this course, I'll show you how advanced technology can boost profits and replace experienced field personnel who have retired or moved on. Finding and training skilled field personnel is increasingly difficult, impacting profitability. Advanced tech offers a solution, enabling efficient operations with a smaller workforce. We'll explore technologies like aerial LIDAR, photogrammetry, terrestrial scanning, and mobile mapping, which streamline workloads and enhance client satisfaction. These tools shift tasks from the field to the office, optimizing efficiency. Join me to discover how integrating advanced tech can overcome workforce challenges and ensure sustained profitability.

Robert Martin, PS Employed by Navigation Electronics since 2006, Robert is a licensed surveyor in Arkansas and Mississippi. Robert works with the surveyors in Alabama and the panhandle of Florida for NEI selling and training on Trimble geospatial products. Robert's survey career started in 1986 with Mickle & Waggner in Fort Smith, AR. You can find Robert on YouTube under Surveying with Robert with 11,000 subscribers, where he enjoys sharing his experience and knowledge of surveying.

Retracement of the Initial Baseline Survey for Florida (Before GPS)
Course #10818 – 2 CECs
Allen Nobles, PSM

8:30 am - 10:10 am

This class will cover the retracement survey of 75 miles of the initial Florida baseline ran in 1824 with a compass and survey chain. This project was done before GPS (1979) so we will cover the use of a Litton inertial guidance system for control; the search for witness trees; proving section corners; doing the solar observations for control traversing; and the data results found.

Allen Nobles, PSM is a licensed surveyor in Florida and Georgia and has previously managed his own company in North Florida for 40 years delivering multidisciplinary professional services in the surveying industry and has an extensive background in hands on surveying, project management and business practices. Mr. Nobles is a Life Member of the Florida Surveying and Mapping Society and has been a speaker at the industry's leading professional groups and has provided classes on LiDAR, photogrammetry, GPS, and boundary surveying for many professional groups (including the University of Puerto Rico, FAU, the University of Florida and Troy University). He has also provided several articles for the major surveying magazines on a wide range of subjects.

Conference Seminars

Saturday - July 27

10:30 am - 12:10 pm

Surveying Railroad Corridors with Respect to Property
Course #10819 – 2 CECs
Leslie Odom, PSM

This course discusses the historical, best practices and practical problems in determining railroad corridor locations with respect to the land and property rights beneath the tracks. Railroads have played a major role in the settlement and development of these United States of America. The importance of 'bands of steel' uniting the country was underscored by the powers granted the railroad companies to acquire land and property rights in whatever way necessary, whether by grant, fee simple absolute, fee with reversionary right, fee determinable, easement or simply by occupation. Surveyors involved with the original location and placement of the railroad faced hostile environments, extreme weather conditions, low pay, no beds, no showers and few hot meals. Today, our goal is to follow in their footsteps and define, as best we can, the original configuration of the rails and the land parcels associated with the rails.

Leslie Odom, PSM is a Registered Land Surveyor in Texas and Florida and has 28 years of land surveying experience with 12+ years dedicated to surveying the railroad at CSX (retiring 2017) and various other railroad projects since retiring. As the lead in-house surveyor for CSX, his responsibilities included managing surveys in 23 eastern states and 2 Canadian provinces and being an expert witness in several railroad land disputes. Les has surveyed and designed tracks within active rail yards, mainlines, passing sidings and industry tracks. Les is a graduate of the University of West Florida with a B.A. in Mathematics, has taught surveying mathematics at Northlake Community College in Lewisville, Texas and authored mathematic courses specific for survey technicians.

10:30 am - 12:10 pm

A.I. Unleashed - Surveyor's Dream or Nightmare
Course # 10820 – 2 CECs
Dr. Youseff Kaddoura, PhD

This presentation explores the possible advantages and hurdles associated with incorporating A.I. technologies into geospatial analysis and surveying. Attendees will be guided through the changing terrain where surveying and artificial intelligence converge, examining the intricate dynamics of A.I. as both an ally and a potential obstacle in the realm of surveying technologies.

Dr. Youssef O. Kaddoura, PhD currently holds the position of Academic Program Specialist II at the Fort Lauderdale research and Education Center within the University of Florida (UF). His Ph.D. in Geomatics Science from UF forms the basis for his specialized focus on developing a replicable technique for georeferencing oblique tower mounted (PhenoCam) images. In addition to his responsibilities as Chapter Coordinator at FSMS Broward Chapter, Dr. Kaddoura has served as a voting Board Member for ASPRS in the years 2020 and 2023, and he presently serves as ASPRS Florida Region President. Beyond his doctoral degree, he also earned a Master of Science in Computer Engineering, also from the University of Florida. Prior to his tenure at the University of Florida, Dr. Kaddoura gained valuable expertise through employment at Geospatial Consultancy Company, an ESRI affiliate.

10:30 am - 12:10 pm

An Introduction to Leveraging Remote Sensing and Surveying Practices for Design-Grade Survey Projects Course #10821 — 2 CECs
Michael Zoltek, LS,CP,CFedS, GISP,PMP/Jeffery Young, PSM, CP, PPS, SP

As remote sensing, surveying, and geospatial technology continue to improve, so do the requirements and workflows for applying these services to engineering design and survey projects. This presentation will provide a background in remote sensing technology and will give insight into how to apply remote sensing technology and methods to projects that have a tight accuracy tolerance. Topics will include the creation of customized flight and drive acquisition plans for aerial and mobile mapping projects, the design of ground control layouts, the feature extraction and compilation process, and the QA/QC of final deliverables. Attendees will leave this class with an understanding of remote sensing workflows and, how they are applied to design projects, and how to assess the accuracy of remotely sensed data.

Mike Zoltek is a land surveyor, photogrammetrist, and GIS professional with over 30 years of geospatial experience. As the National Geospatial Program Director at GPI Geospatial, Inc. (GPI), Mike is responsible for the coordination, execution, and supervision of projects for local, state, federal, DOT, and private clients. A licensed surveyor who holds active registrations in 26 states Mike brings to clients a comprehensive background in surveying and mapping, which includes data collection and processing, project management, and QA/QC coordination. Mike is a current member of Florida's State Board of Professional Surveyors & Mappers and is a long-standing member of the American Society for Photogrammetry and Remote Sensing (ASPRS). Mike has presented numerous technical seminars at universities and community colleges, as well as at industry conferences, and has served as an expert witness in boundary litigation cases in the state of Florida.

T. Jeffrey "Jeff" Young has more than 40 years of involvement in the photogrammetry field. Currently a Senior Geospatial Manager with GPI Geospatial Inc., Jeff manages photogrammetry projects for the company out of their Tampa office. Formerly with Pickett and Associates, Inc., Jeff managed the Lakeland based photogrammetry department for 25 years. Jeff was also with BKS Surveys, Ltd. in Northern Ireland and Washington, D.C. He has received extensive photogrammetric training and has vast experience utilizing analog, analytical, and softcopy photogrammetric instruments. Jeff earned his Photogrammetric Training from Coleraine Technical College in Northern Ireland. He is a Florida licensed Surveyor & Mapper, a licensed Photogrammetric Surveyor with the State of South Carolina, a licensed Surveyor Photogrammetrist with the Commonwealth of Virginia.

Conference Seminars

Saturday - July 27

1:30 pm - 3:00 pm

Tidal Datums and Property Boundaries
Course #10822 — 2 CECs
Dr. Nick DiGruttolo, PSM, PhD/Martin Scott Britt, PSM

This seminar covers the things a surveyor needs to know to establish a boundary line on a tidal water body. We will discuss the forces that influence the tides and the causes of local variations. Tidal datums and how to determine their elevation at a project site will be described. The effects of erosion, accretion, avulsion and sea level rise on tidal boundaries will be shown with case studies and the resources and methods surveyors use to perform tide studies will be compared in detail.

Nick DiGruttolo, PSM, PhD has been surveying since 1988 and spent 15 years working as a field crew chief for Sarasota County before moving to Gainesville to pursue his bachelors in Geomatics. After obtaining the bachelor's degree, Nick obtained surveying licenses in Florida, Georgia and Mississippi and completed a MSc and PhD, with a concentration in geomatics, while working for Northrop Grumman Advanced Geospatial Intelligence Operating Unit. Nick's PhD research focused on variations in mean high water in bays and tidal creeks. Nick currently works for Pickett and Associates as a Survey Manager supporting electrical utility projects.

Martin "Scott" Britt, PSM founded MSB Surveying, Inc. in 2000 and is currently the acting President and Surveyor & Mapper. Scott is a second-generation Surveyor & Mapper in the Sarasota, Manatee and Charlotte County areas and he has surveyed for over forty years. His expertise and project experience includes historical research and local knowledge, boundary, topographic, hydrographic, mean high water, tidal studies, littoral rights, route surveys, construction stake out, subdivision and condominium platting, ALTA/ACSM Land Title Surveys, FEMA Elevation Certificates, and expert witness on boundary, tidal water boundaries and littoral lines.

1:30 pm - 3:00 pm

Emerging Technology for Data Collection
Course #10823 — 2 CECs
Adam Long, PE, PS

This course will provide examples of the use of emerging technologies for surveying and mapping. This will include current programs using AI technologies for extracting survey data from photos and LiDAR, working with 3D data in visible formats, working with a Calibration Test Facility to test equipment specifications from a surveyor's point of view, and examples of other emerging technology trends.

Adam Long, PE, PS joined SAM in 2011 as Chief Technology Officer. He has over 30 years of diverse experience in engineering, surveying, and information technology, which he used to create the Applied Technology department at SAM. Adam partners with SAM leaders to provide strategic technology innovation focusing on quality and efficiency for client solutions. His curiosity in technology and physical sciences fosters original ideas and designs that deliver precise results. Adam holds a Bachelor of Science in Civil Engineering from Ohio State University and is registered as an engineer in Ohio and Texas, as well as a Registered Professional Land Surveyor in Ohio, Indiana, Texas, and West Virginia. He has served as an adjunct professor in the Geospatial Engineering Department at the Austin Community College since 2014, teaching Engineering Design Surveying, Land Surveying, and Intro to Surveying.

1:30 pm - 3:00 pm

The Role of Title in the Government Acquisition Due Diligence Process
Course #10824 — 2 CECs
Wendi McAleese

During this presentation, Wendi will discuss the various title products available, how each one supports the due diligence products required by government agencies, including surveys, and how to determine which one best meets the needs of project stakeholders. Wendi will review title issues relevant to the survey and outline changing agency concerns with these issues. She will present recent case studies for these issues and discuss solutions used to move projects forward.

Wendi McAleese is a Florida licensed Title Agent and a Florida licensed Real Estate Agent with 25-plus years of experience with public acquisition projects. Wendi is the President and a principal at American Government Services Corporation, a full-service title agency which specializes in acquisitions by government agencies at all levels – local, state and federal. She has recently been appointed to the Florida Board of Professional Surveyors and Mappers as one of two Consumer Members.

Conference Seminars

Saturday - July 27 - All Day Course

8:30 am - 3:30 pm

Surveying the Infrastructure of GIS
Course #10815 — 6 CECs
Moderator: Richard Allen, PSM, CFM (9 speakers)

CAD vs GIS, & Intro to the "Parcel Fabric" Frank Conkling PSM, GISP
Successful Project Integration of Survey & GIS Richard Pryce, RLS, PSM
Panel Discussion - Experts and Users on Survey and GIS

A presentation on the differences between CAD and GIS and an introduction to the Parcel Fabric by Frank Conkling, PSM, GISP, and then a presentation of Successful Project Integration of Survey & GIS by Rick Pryce, PSM. Following the presentations will be a panel discussion of the topics presented and what opportunities, misconceptions, and problems that exist for those in both industries with a diverse group of individuals from academia, government, and the private sector.

Richard Allen, PSM, CFM is a Florida Licensed Surveyor & Mapper and Certified Floodplain Manager. He is the City Surveyor at the City of Orlando. He has been in surveying for over 27 years and has been with the City for 18 years. He is the Surveyors in Government Liaison for FSMS, Region V Director for the Florida Floodplain Manager's Association, and a Director for the ASPRS Florida Region. He is the scholarship chair and Valencia College Liaison for the Central Florida Chapter of FSMS. He is an Adjunct Professor at Valencia College's Built Environment Program, teaching Surveying and Drafting. He is married to his lovely wife Amanda and has a son named Richie.

Frank J. Conkling, PSM, GISP owns Panda Consulting, an LB-licensed Professional Surveying and Mapping business offering GIS Professional Services since 1998. Frank is a recognized authority on GIS and Surveying and Mapping technology, including mapping various types of ownership interest in land. Frank has been involved in GIS and Parcel Mapping since 1974 and has enjoyed studying and guiding the creation, implementation, and maintenance of some of the country's most effective GIS systems and most accurate land ownership databases. Frank is a licensed Professional Surveyor and Mapper in Florida and a licensed GIS Surveyor in South Carolina. He is a Past President of the Florida Association of Cadastral Mappers, an organization focused on cadastral mapping throughout the state of Florida, and a Member Emeritus of the Florida Board of Professional Surveyors and Mappers, the regulatory Board for all Surveyors and Mappers in the State. Panda Consulting is the first organization in the nation to receive the Esri Parcel Management Specialty Designation.

Richard Pryce, RLS/PSM Vice President Survey & G.I.S. at Craven Thompson & Associates, Inc.; current President-Elect for State FSMS; former Director and President of Broward Chapter FSMS. Rick has been surveying since 1972 and was licensed in 1983. He has performed surveys in 42 counties within Florida and was an early adopter of Geographic Information Systems using ESRI software since 1990. He has successfully integrated and completed multiple Survey, Engineering, and GIS multi-million-dollar projects over the past three decades and has provided numerous presentations and general talks on them to a diverse group of Engineers, Surveyors, and GIS Professionals. His interest, knowledge, and expertise in remote sensing started in 1996 when he worked directly with a remote sensing firm while surveying, to assist in developing a precision agriculture applications. He has expanded his knowledge and expertise to include all forms of LiDAR, (terrestrial, mobile and aerial) since then, and has also included forensic work on disaster sites. He developed multiple ways to QA/QC LiDAR work and check both horizontal and vertical accuracies to improve upon the final product. Most recently he has been using his background with LiDAR and remote sensing to assess properties for Monroe County Land Authorities in determining how much of the property is below the Mean High water line.

Panelists:
Richard Allen, PSM, City of Orlando Surveyor
Frank Conkling, PSM, GISP, Owner Panda Consulting
Richard Pryce, RLS/PSM, VP Survey & GIS at Craven & Thompson
Matthew Kalus, PSM, PE, Chief Engineer, Development Review Services, Orange County
Dr. Bon Dewitt, PSM, PhD, Retired Professor Geomatics at UF
Allen Nobles, PSM, VP. SAM,LLC & Former Owner: Nobles Consulting
Greg Caffee, CCF, Mapper Sr./Cadastral, Orange County Property Appraiser
Howard Ehmke, PSM, GCY, INC
Mike Garcia, PSM, Program Manager II, Seminole County

69th Annual FSMS Conference

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Doubletree by Hilton Hotel Orlando at SeaWorld
10100 International Drive Orlando, FL 32821

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Packet 1 – Full Registration/Best Value

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Packet 2 – Partial Registration

Member	$355
Licensed Non-Member	$455
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Packet 3 – Saturday Only

Member	$230
Licensed Non-Member	$330
Non-licensed	$180

(Includes six (6) Saturday Seminar CECs)

Saturday Seminars
July 27

Course options are listed below, please mark the circle next to the course. Choose only ONE course per time segment.

6 Hour Course Option			
8:30 am – 3:30pm (All day course)	Course name: Surveying the Infrastructure of GIS CAD vs GIS, & Intro to the "Parcel Fabric" Frank Conkling PSM, GISP Successful Project Integration of Survey & GIS Richard Pryce, RLS, PSM Panel Discussion - Experts and Users on Survey and GIS - Moderator: Richard Allen, PSM, CFM (9 speakers) (6 CEC – Course #10815)		
2 Hour Course Options			
8:30 am–10:10 am (choose one from this row)	Course name: Boundary Litigation and the Surveyor (2 CEC – Course #10816) Instructor: Knud Hermansen PLS, PE, Ph.D., Esq.	Course name: Filling Available Survey Positions with Technology (2 CEC - Course #10867) Instructor: Robert Martin, PS	Course name: Retracement of the Initial Baseline Survey for Florida (Before GPS) (2 CEC - Course #10818) Instructor: Allen Nobles, PSM
10:30 am – 12:10 pm (choose one from this row)	Course name: Surveying Railroad Corridors with Respect to Property (2 CEC - Course #10819) Instructor: Leslie Odom, PSM	Course name: A.I. Unleashed – Surveyor's Dream or Nightmare (2 CEC - Course #10820) Instructor: Dr. Youseff Kaddoura, PhD	Course name: An Introduction to Leveraging Remote Sensing and Surveying Practices for Design-Grade Survey Projects (2 CEC – Course #10821) Instructors: Michael Zoltek, LS, CP, CFedS, GISP, PMP/ Jeffrey Young, PSM, CP, PPS, SP
1:30 pm – 3:10 pm (choose one from this row)	Course name: Tidal Datums and Property Boundaries (2 CEC – Course #10822) Instructors: Dr. Nick Digruttolo, PSM, PhD/Martin Scott Britt, PSM	Course name: Emerging Technology for Data Collection (2 CEC – Course #10823) Instructor: Adam Long, PE, PS	Course name: The Role of Title in the Government Land Acquisition Due Diligence Process (2 CEC - Course #10824) Instructor: Wendi McAleese

Additional Seminar Offerings

Wednesday Seminars (Separate Registration Required)
July 24
8:00 am – 3:00 pm
ONLY CHOOSE ONE

Seminar I:

Riparian Rights Surveying
(6 CEC's - Course #10807)

Panel Discussion (6 speakers)
Moderator: Richard P. Green, Esq.

Seminar II:

A Mock Trial - A Boundary Dispute Case
Based in part on the case of
Dowdell v. Cotham
(6 CEC's - Course #10808)

Instructor:
Jeffery N. Lucas, JD, PLS, Esq.

*SIT Prep Course (**Un-Licensed Attendees, No CEC Credit**)*
July 24
8:00 am – 4:00 pm

Geoscholar's Florida Surveying and Mapping Society Fundamentals of Surveying (FS) Exam/Surveyor in Training (SIT) Certificate Prep Course

You must complete the online course before attending the Seminar. Dr. Lyle will be covering select questions over the required sections to help you with examination preparation. After the Seminar you will have access for 1 year to the online course.

Instructor:
Dr. Stacey Lyle, PhD, RPLS, PLS

Thursday Seminars (Separate Registration Required)
July 25
8:00 am – 10:45 am
ONLY CHOOSE ONE

Seminar I:

The Historical Cartography of Florida
(3 CEC's - Course #10809)

Instructor:
Dr. Joe Knetsch, PhD

Seminar II:

Impact of NGS 2022 DATUM & Low Distortion Projections (LDPs) to Mapping & Engineering Projects
(3 CEC's - Course #10810)

Instructor: Vasileios "Vas" Kalogirou, RPLS, PLS, PS, PSM, LS

Complete payment information on the following page

Cancellation Policy:
30 days prior to conference: 50% refund
Less than 30 days to conference: No refund

69th Annual FSMS Conference Registration Form

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PACKET SELECTION

		$ Amount:
Packet 1 ($370 member, $470 licensed non-member, $320 non-licensed) *Licensed government employees receive a $100 discount on Packet 1*	Includes: 1 Welcome BBQ ticket (Wed.), 1 Exhibit Hall Breakfast ticket (Fri.), 1 Exhibit Hall Lunch ticket (Fri.), 1 Recognition Banquet ticket (Fri.), and 6 Saturday Seminar CECs (Continuing Education Credits)	$
Packet 2 ($355 member, $455 licensed non-member, $305 non-licensed)	Includes: 1 Exhibit Hall Lunch ticket (Fri.), 1 Recognition Banquet ticket (Fri.), and 6 Saturday Seminar CECs (Continuing Education Credits)	$
Packet 3 ($230 member, $330 licensed non-member, $180 non-licensed)	Includes: 6 Saturday Seminar CECs (Continuing Education Credits)	$

ADDITIONAL SEMINARS

Only Select One Per Day

			$ Amount:
SIT Prep Course - Wed. (8 hrs.) For Un-Licensed Attendees, 0 CECs	$300	July 24, 8:00 am – 4:00 pm Instructor: Dr. Stacey Lyle, PhD, RPLS, PLS	$
Wednesday Seminar I (6 hrs.)	$220	Riparian Rights Surveying (Panel Discussion) Course #10807 — 6 CECs July 24, 8:00 am – 3:00 pm Moderator: Richard P. Green, Esq.	$
Wednesday Seminar II (6 hrs.)	$220	A Mock Trial – A Boundary Dispute Case Course #10808 — 6 CECs July 24, 8:00 am – 3:00 pm Instructor: Jeffery N. Lucas, JD, PLS, Esq.	$
Thursday Seminar I (3 hrs.)	$120	The Historical Cartography of Florida Course #10809 — 3 CECs July 25, 8:00 am – 10:45 am Instructor: Dr. Joe Knetsch, PhD	$
Thursday Seminar II (3 hrs.)	$120	Impact of NGS 2022 DATUM & Low Distortion Projections (LDPs) to Mapping & Engineering Projects Course #10810 — 3 CECs July 25, 8:00 am – 10:45 am Instructor: Vasileios "Vas" Kalogirou, RPLS, PLS, PS, PSM, LS	$

EVENT TICKETS

Only Pay if Participating

		Number of Tickets:	*$ Amount:*
Golf Match (Wed):	$100 per person		$
	$200 per team (2 players)	Players:	$
Top Golf (Thur.):	$120 per person		$
*Casino Night (Thur.):	$50		$

FOOD TICKETS (Additional or Individual Tickets)

**** No cancellations unless replacement found***

		Number of Tickets:	*$ Amount:*
Welcome BBQ (Wed.):	$55 or $65 (at conference)		$
*Legislative Reception (Thur.):	$100		$
Exhibit Hall Breakfast (Fri.)	$20 or $30 (at conference)		$
Exhibit Hall Lunch (Fri.):	$50 or $60 (at conference)		$
Recognition Banquet (Fri.):	$100 or $110 (at conference)		$
	$25 (kid's meal 12 or under)		$
	Requested Vegetarian Meal		

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CHAPTER NINE
Lake Okeechobee II: Science in a Race with Politics and Nature

Throughout the 1980s, two other problems, inextricably tied to the Kissimmee, simmered in Florida: how to improve the water quality of Lake Okeechobee and how to regulate the lake's stage in order to protect its littoral zone. Although studies were conducted and recommendations made about the littoral zone, most of the focus in the time period was on water quality. In December 1981, for example, the SFWMD adopted a management strategy for protecting water quality in Lake Okeechobee, a natural outgrowth of the SFWMD's institutional transformation nine years earlier when the flood control district became a water management district. Historically, the district had two primary goals in managing the waters of Lake Okeechobee: to control flooding in time of heavy rainfall, and to supply water for agriculture and the urban centers in South Florida in time of drought. Now the SFWMD recognized "a third major goal of equal importance . . . namely, to maintain and improve the quality of the water resources within the District."[1] But this bland pronouncement understated the extent that the ground was shifting under the SFWMD. If flood control and drainage were public works that abetted economic growth, water quality fundamentally involved the imposition of economic restraints. In the past, when the district was primarily concerned with water supply, it was able to treat water as a raw resource to be exploited for economic gain. Now that the district was responsible for water quality, it had to treat water as commons, not property. Neither the people within the institution nor the SFWMD's many partners in government and the private sector were prepared for such a fundamental shift in thinking.[2]

Yet, still, as discussed in previous chapters, it was really state and not federal initiatives in the 1980s that drove water management in South Florida, including the work on Lake Okeechobee. The Corps continued to operate the C&SF Project for flood protection and water supply (both to urban areas and to the Everglades), but these efforts were largely overshadowed by state promotion of the preservation of the South Florida ecosystem, in large part against the effects of the C&SF Project. Just as Kissimmee River restoration was one piece of the state plan to "Save Our Everglades," the SFWMD's concern with Lake Okeechobee water quality and regulation levels served as an essential part of the program.

In order to get a firm grip on the problems with water quality in Lake Okeechobee, scientists used a systems ecology approach, especially focusing on mathematical and computer models to determine nutrient loading in the lake. At the same time, advances in chemistry and other forms of scientific measurement that had been ongoing in the post-World War II era enabled scientists to measure smaller and smaller particles, allowing for better analyses of problems in waterbodies such as Lake Okeechobee. Scientists were thus able to use the techniques of physics, chemistry, geology, geochemistry, meteorology, and hydrology "to measure ecosystem parameters at increasingly sophisticated levels and to analyze large data bases."[3]

pressure the Corps to expedite its study and to champion Kissimmee restoration, new environmental organizations appeared, including the Kissimmee Restoration Coalition and Marshall's Coalition to Repair the Everglades.[5] Meanwhile, the Friends of the Everglades, holding that "the opportunity for the State of Florida to dechannelize the lower Kissimmee will not remain long," prepared a petition requesting that the state disallow further floodplain development, that it purchase floodplain lands, and that Congress and the President of the United States order the Corps to restore the river.[6]

As the first years of the 1980s passed, the Corps increasingly fell behind schedule on its feasibility study, frustrating many state officials. Victoria Tschinkel, secretary of the Florida Department of Environmental Regulation, for example, told newspapers that "the Corps was very behind schedule and above budget on its plans to restore the Kissimmee River."[7] She and Governor Graham called on the Corps to accelerate its work, and Jacksonville District Engineer Colonel Alfred Devereaux responded by pledging to have a decision by the end of 1982 as to how restoration could occur.

Many critics claimed that the Corps was merely dragging its feet because it did not want to dechannelize the Kissimmee, an accusation that Devereaux denied. He blamed the delays on SAM, explaining that the program had never been used on such a large study as the Kissimmee River plan, and that, therefore, establishing parameters became a long, drawn-out process. It "took a lot longer to get working than expected," he said, estimating that the program "probably

A broad leaf marsh in the vicinity of the Kissimmee River. (Source: South Florida Water Management District.)

In using these methods to scrutinize Lake Okeechobee, scientists focused on two separate but related problems to the waterbody's eutrophication: how to get a better scientific understanding of what was causing the lake's eutrophication, and how to distribute the burden of economic restraints that would accompany control measures. It was evident that the SFWMD must find a way to reduce nutrient loading of the immense lake, but farmers and environmentalists disagreed strongly about where the control measures should fall and who should pay for them. Indeed, agricultural interests were divided among themselves. Opinion differed as to whether dairy farms north of the lake or sugar cane fields south of the lake were the main polluters. Opinion differed, too, on how fast eutrophication was occurring – an unknown that made it exceedingly difficult for the SFWMD to weigh management options on a cost-benefit scale.

One divisive issue was Lake Okeechobee's regulation schedule, which dictated lake "stages," or the quantity of water held in the lake from month to month. In 1978, the Corps of Engineers and the SFWMD implemented a new regulation schedule that raised the maximum lake stage level from 15.5 feet to 17.5 feet above sea level. While this increased the water supply, it had deleterious effects on water quality. High water affected marsh vegetation around the shoreline – the shallow lake's extensive "littoral zone," which accounted for more than one-fifth of the lake's surface. Continuous inundation of much of Lake Okeechobee's marsh area reduced the diversity of plant species, thereby affecting wading birds, waterfowl, reptiles, and fishes. In 1984, for example, the SFWMD published a study detailing the effects of high lake stages on wading bird utilization of Lake Okeechobee's littoral zone. The study concluded that "successful feeding conditions" for wading birds required a receding lake stage below 15.0 feet above mean sea level (msl), while successful nesting required "that the ground beneath the colony during the nesting period be flooded" from March to July.[4] Other examinations verified the damage that high lake levels caused to vegetation. Three years after the Corps had elevated the regulation schedule to 15.5-17.5 feet msl, scientists reported that "substantial changes" had occurred "in the composition and distribution of plant communities" in the littoral zone. These included the destruction of spikerush (*Eleocharis cellulose*), the proliferation of cattails, and the domination of torpedo grass (*Panicum repens*) in the mixed grass zone.[5]

The problem was that the Corps of Engineers and the SFWMD had to develop a regulation schedule for Lake Okeechobee that also took into account the water storage needs of urban and agricultural areas. Before 1974, the schedule had kept lake levels from exceeding 15.5 feet msl, while also allowing recessions down to 13.5 feet msl. This changed in the 1970s when the Corps elevated the schedule to between 14.5-16.0 feet msl in 1974 and then increased it to 15.5-17.5 feet msl in 1978 as explained above. The changes created less than optimal conditions for flora and fauna inhabiting the littoral zone, although scientists still needed more time to analyze how severe the effects really were.[6]

The same battle had been waged in the 1970s over the regulation schedules of the water conservation areas. Environmentalists deplored the Corps' drastic drawdowns of water levels in the areas, mainly because of the damage it caused to flora and fauna, and they also wanted better regulation in order to mitigate the effects of high water on deer populations. However, although the Corps reexamined its conservation area regulation schedules in the late 1970s, its final report – issued in October 1980 – concluded that no reason existed for modifying the schedules.[7]

Lake Okeechobee marsh area. (Source: South Florida Water Management District.)

Environmentalists and sportsmen hoped for more success with Lake Okeechobee regulation. Yet sugar growers remained staunch advocates of the new regulation schedule since it protected them from drought. Thus, the schedule highlighted conflicts between the needs of water quality and water quantity, and the gulf in thinking about water as commodity or commons.[8]

At the same time, changes in marsh vegetation in turn affected the lake's ability to assimilate nitrogen and phosphorus inputs, inextricably tying protection of the littoral zone to Lake Okeechobee water quality issues. One source of contention that aggravated the SFWMD's efforts to approach water quality evenhandedly and dispassionately was backpumping. Environmentalists focused on backpumping in part because of their animosity toward the sugar industry. But they had pragmatic reasons as well: it was easy to locate where the effluent was coming from (in contrast to "nonpoint source pollution"), and they could request public officials to stop it. Moreover, it was completely unnatural. By the flip of a switch, the SFWMD and the Corps of Engineers could activate the large S-2 and S-3 pumping stations on the south shore of Lake Okeechobee and reverse the flow of water through the three main canals braiding the 188,000-acre EAA, siphoning nutrient-laden water out of the sugar cane fields back into the lake. Environmentalists were appalled that the state would continue this practice in the face of mounting evidence that it was harming the lake. They were unmoved by arguments that backpumping was necessary during drought conditions to protect the water supply of South Florida. Although this activity was not the primary cause of nutrient loading of Lake Okeechobee, the S-2 and S-3 pump stations were obvious sources of agricultural pollution that the state controlled and could seemingly shut off at will. Therefore, environmentalists targeted

backpumping as an evil, pressured the SFWMD to stop it, and attacked the sugar growers by extension.[9]

The controversy over backpumping formed the immediate background to the SFWMD's formulation of a water quality management strategy. Environmentalists argued that the state should not allow the operation of the S-2 and S-3 pumps without a permit. In 1977, the Florida Department of Environmental Regulation issued a Temporary Operating Permit to the SFWMD to continue backpumping, pending the completion of the district's scientific investigation on the eutrophication of Lake Okeechobee. In 1979, the Florida Wildlife Federation and other environmental organizations brought suit against the Department of Environmental Regulation and the SFWMD, alleging that the backpumping of polluted water from the EAA into Lake Okeechobee violated state water quality standards. The Florida Sugar Cane League, Inc., and Dairy Farmers, Inc., intervened as interested parties in the lawsuit. The threat of litigation prompted the department to order the SFWMD to develop a water quality plan for Lake Okeechobee.[10] This was the political underpinning of the SFWMD's announcement in December 1981 of a new water quality management strategy. It was a necessary requirement to hold onto its Temporary Operating Permit.[11]

The SFWMD based the water quality management strategy on its newly completed scientific study of the lake. This study produced a conceptual model of Lake Okeechobee using extensive data on the lake's chemical and biological properties. The purpose of the model was to predict ecological change, test outcomes based on different inputs, and inform management guidelines – all with the goal of preventing catastrophic eutrophication of Lake Okeechobee.[12] Although overly simplistic by later standards, the model represented a sophisticated advance in water management and a first step on the path toward Everglades restoration.

S-2 pumping station on the south end of Lake Okeechobee. (Source: South Florida Water Management District.)

As helpful as the conceptual model might be in selecting the appropriate management options for the protection of Lake Okeechobee, the model did not exist in a political vacuum, nor did it insulate management decisions from politics in the coming decade. Although the state successfully averted litigation over backpumping in the early 1980s, management of Lake Okeechobee continued to provoke considerable controversy. In 1985, Governor Graham established the Lake Okeechobee Technical Advisory Committee, made up of scientists from government, academia, and the private sector, to provide technical advice to the SFWMD in defining management options for Lake Okeechobee. Two years later, in 1987, the Florida legislature enacted the Surface Water Improvement and Management (SWIM) Act, requiring the SFWMD to develop a plan for Lake Okeechobee and other water bodies in South Florida.[13] Ultimately the same water pollution problems that were involved in the protection of Lake Okeechobee would form the basis for a federal lawsuit against the state of Florida in 1988, even though that suit would focus on waters entering Loxahatchee National Wildlife Refuge and Everglades National Park. Throughout the 1980s, the SFWMD put forward its conceptual model of Lake Okeechobee in part to keep the district on an even keel as it navigated these roiling political waters.

The use of a model to represent Lake Okeechobee's chemical and biological properties derived from a growing worldwide science on eutrophication of lakes and reservoirs. If the Kissimmee-Okeechobee-Everglades ecosystem was biologically unique, the accelerated eutrophication of Lake Okeechobee was not unusual at all. The same phenomenon had overtaken Lake Apopka in North Florida and was occurring in numerous water bodies all over the world. A by-product of human population growth, agricultural expansion, and increased use of fertilizers in crop production, "cultural eutrophication" was found to result when unnaturally large quantities of plant nutrients, mainly nitrogen and phosphorus, were loaded into lakes, thereby stimulating production of algae and other macrophytes and starting a train of other biological and chemical effects that could ultimately kill the lake. In the 1960s, scientists began to develop simple models using algorithms to approximate the real-world conditions of lakes that were undergoing accelerated eutrophication. The algorithms correlated such lake characteristics as water depth and surface area, water residence time (or flushing rate), and volume of nutrient loading. The use of models as a management tool for controlling eutrophication required the accumulation of empirical and statistical data over several years, and the selection of an appropriate model for the lake. By the mid-1970s, there were a handful of tried and tested models available to water managers, and the use of models had become an integral part of recommended management practice for controlling eutrophication.[14]

The SFWMD initiated a study of the biology and chemistry of Lake Okeechobee in 1973 aimed at developing the necessary data for modeling the lake. The study included four components: collection of lake water samples to obtain water chemistry data for trend analysis; development of a "material budget" (the measurement of the amount of water, phosphorus, nitrogen, and chloride coming into and leaving the lake at various points around the lakeshore); collection of data on the physical, biological, and chemical properties of the lake in spatial relationship; and finally, a trophic state assessment (to determine if the lake was oligotrophic, mesotrophic, or eutrophic). This major study continued through March 1980, yielding seven years of data for the SFWMD's initial modeling effort. In total, over 5,500 water samples were

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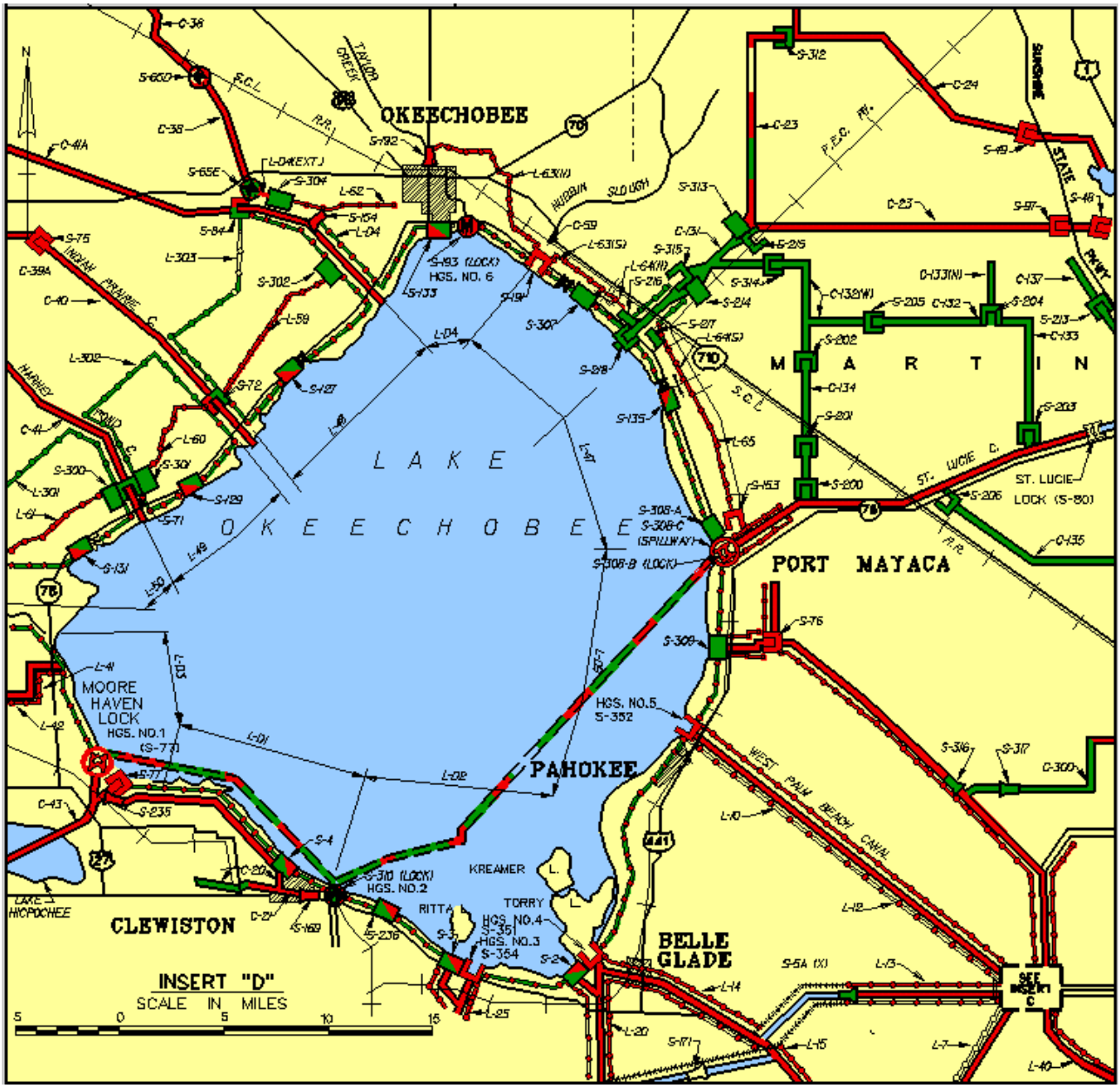
collected and analyzed for nitrogen species, phosphorus species, sodium, potassium, calcium, magnesium, chloride, alkalinity, color, turbidity, temperature, dissolved oxygen and specific conductivity, providing over 115,000 data points.[15]

Four scientists with the SFWMD – Anthony C. Federico, Kevin G. Dickson, Charles R. Kratzer, and Frederick E. Davis – analyzed the data and produced a detailed report, "Lake Okeechobee Water Quality Studies and Eutrophication Assessment," in May 1981. One of the authors' findings was that the chemical and biological properties of Lake Okeechobee varied widely across its large expanse. The highest concentration of phosphorus occurred at the outlet of Taylor Creek/Nubbin Slough at S-191 downstream from the dairy farms. The highest nitrogen levels were found at the pump stations S-2 and S-3 at the head of the North New River and Hillsboro canals and the Miami Canal, respectively, where irrigation water from the EAA was backpumped into the lake. Thus, at the northern location there was an excess of phosphorus



Lake Okeechobee and C&SF Project structures. (Source: U.S. Army Corps of Engineers, Jacksonville District.)

relative to what plants could absorb, while at the southern location there was more nitrogen than plants needed.[16] Since a major strategy in the control of eutrophication was to identify the limiting nutrient and reduce its input into the water body, this circumstance complicated the lake's management. Neither phosphorus nor nitrogen could be conclusively identified as the limiting nutrient, so both would have to be addressed.

Another result of the study was an improved understanding of the residence time of water in the lake. There were two elements to this: the average time that water took to move through the lake (excluding evaporation) and the average elapsed time for water coming into the lake to replenish water going out of the lake (excluding rainfall). For this large, shallow lake, the average water residence time was a sluggish 3.47 years, the hydraulic loading rate a somewhat brisker 1.57 years. During the period 1973 to 1979, direct rainfall and the Kissimmee River amounted to approximately 70 percent of the water coming into the lake, while evaporation accounted for almost 66 percent of the water leaving the lake. These characteristics were important to understand in order to determine the impact that water from different sources had on Lake Okeechobee's phosphorous levels. The authors found that the longer it took water to move through the lake the more phosphorus and nitrogen was retained.[17]

Federico, Dickson, Kratzer, and Davis tested eight nutrient loading models for their applicability to Lake Okeechobee, and selected a modified Vollenweider model, published in 1976. R. A. Vollenweider was a prominent limnologist of Canada. As the authors noted, Vollenweider's first model, published in 1968, was based on a mathematical relationship between water depth and various measures of water quality.[18] A limitation of the model was that the measures of water quality were largely subjective. Subsequent models in the early 1970s refined Vollenweider's equation by factoring in trophic state indices, or quantitative indices used in categorizing lakes according to their place on a continuum from oligotrophic (nutrient-poor) to eutrophic (nutrient-rich). The EPA had developed one such index, as had a number of limnologists in the early to mid 1970s. Kratzer, one of the authors of the SFWMD report, had developed a trophic state indice specific to nitrogen levels in Florida lakes. Federico, Dickson, Kratzer, and Davis found that the indices were useful as far as they went, but the early indice-based models did not take into account water residence time and hydraulic loading rate – critical factors recognized by Vollenweider in his model of 1976.[19] The latter Vollenweider model discriminated among trophic states based on annual phosphorus loading and mean depth divided by hydraulic residence time.[20] It took form as the following mathematical expression:

$$TP = (L_p/q_s)\ (1 + \sqrt{\ } t_w)$$

where: TP = average annual in-lake total phosphorus concentration
L_p = annual areal phosphorus loading
q_s = annual areal water loading
t_w = hydraulic residence time, and
$\sqrt{\ }$ = mean depth[21]

However, one problem remained with this Vollenweider model: it was oriented to lakes in northern temperate zones. Florida lakes, it appeared, could withstand higher total phosphorus concentrations before reaching the same level of production. Based on Kratzer's trophic state

indice for Florida lakes, the authors modified the Vollenweider model to allow higher loading rates. The final result was a plot curve showing "permissible" and "excessive" phosphorus inputs into Lake Okeechobee. As water residence time increased, so too did the permissible phosphorus load. The report included a similar plot curve for the permissible nitrogen load.[22]

Using the modified Vollenweider model, Federico, Dickson, Kratzer, and Davis concluded that Lake Okeechobee had a 78 percent probability of being eutrophic if phosphorus was the limiting nutrient, and a 79 percent probability if nitrogen was the limiting nutrient. The model further indicated that the phosphorus and nitrogen loads were 40 and 34 percent, respectively, above the excessive loading rate. Since the authors could not conclusively state that phosphorus or nitrogen was the limiting nutrient, they recommended that both phosphorus and nitrogen inputs be reduced to the permissible levels predicted by the modified Vollenweider model.[23]

The report by Federico, Dickson, Kratzer, and Davis provided the technical foundation for the water quality management strategy that the SFWMD adopted seven months later. In the latter document, which was approved by the district's governing board on 11 December 1981, SFWMD leadership accepted the finding that both nitrogen and phosphorus loading must be reduced, and it evaluated alternatives according to cost-effectiveness. Describing the control of eutrophication of Lake Okeechobee as "a very ambitious endeavor," it proposed a phased approach over a number of years. Phase I, of unspecified duration, would comprise five major activities. First, the SFWMD would continue the Interim Action Plan, with its provision for limited backpumping into the lake for five years. Second, the district would initiate development of a water retention facility within the EAA on the state-owned Holey Land tract. Third, it would accelerate use of Best Management Practices (BMPs) for dairy farms in the Taylor Creek/Nubbin Slough basin. Fourth, it would implement an expanded regulatory program with more stringent controls on any new construction of drainage systems within the lake's watershed. Finally, the district would coordinate with the Corps of Engineers in ensuring completion of the Kissimmee River Survey Review.[24]

The most controversial part of the strategy involved the Interim Action Plan. The SFWMD developed the plan as its initial response to the threat of litigation over its Temporary Operating Permit, issued to the district by the Department of Environmental Regulation so that the district could continue limited backpumping into the lake through pump stations S-2 and S-3. The plan promised to reduce the nutrient load on Lake Okeechobee by directing water from the sugar cane fields southward to the water conservation areas rather than northward back into the lake.[25] However, it also allowed for a resumption of backpumping in periods of drought in order to take advantage of Lake Okeechobee's water storage capacity. Just such drought conditions prevailed during the summer of 1981, and as the S-2 and S-3 pumps went into action, quantities of nitrogen far in excess of the permissible level were dumped into the lake. In a 12-month period during 1981-1982, water gauges recorded 14,250 tons of nitrogen pouring into the lake – nearly five times the recommended maximum.[26] To avoid a repetition of this event, district staff revised the Interim Action Plan to allow for backpumping in low volumes whenever the lake level fell below historical average.[27]

Reactions to the SFWMD's Lake Okeechobee water quality management strategy were mixed. The Department of Environmental Regulation commented favorably on the overall conceptual plan. However, it added a number of stipulations to the Temporary Operating Permit;

for example, it required the SFWMD to report in detail on the implementation of BMPs in the Taylor Creek/Nubbin Slough basin.[28] The Florida Game and Fresh Water Fish Commission responded chiefly to the proposal to develop a water storage facility on the state-owned Holey Land tract. It had opposed this option in the past, partly because of the impact it would have on the local deer herd, but primarily because the facility would adversely affect Everglades wildlife habitat in Conservation Area No. 3 downstream from the site. It responded more favorably to this proposal because the plan incorporated the adjoining Rotenberger tract into the project, essentially designating one area for water storage and the other area for wildlife.[29]

Environmental groups attacked the SFWMD's plan as both overdue and inadequate. Johnny Jones, executive director of the Florida Wildlife Federation, expressed outrage over the proposed use of the Holey Land area for water storage. "As we read the Management Strategy, it is nothing more than a smoke screen for the South Florida Water Management District's real agenda," he wrote. "That is a further state and federal subsidy for the agricultural interests of the EAA." The sugar growers, Jones insisted, should be forced to retain water on their own lands.[30] Paul C. Parks, commenting on behalf of the Florida Chapter of the Sierra Club, also objected to the use of state land "to take the pollution from farms," and declared, "this plan for the EAA is not going to be acceptable to the public." He was even more skeptical about the district's plan to implement BMPs among the dairy farmers in the Taylor Creek/Nubbin Slough basin. The district was naïve to expect significant results through volunteerism. "These dairies are not 'farms' in the usual sense," Parks wrote. "They are milk factories and their pollution ought to be regulated by the Department [of Environmental Regulation] like that of any other industry."[31]

The Rotenberger Tract. (Source: South Florida Water Management District.)

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Parks also voiced skepticism about the district's use of the modified Vollenweider model. He maintained that the model provided reasonable guidance for getting started on nutrient load reductions, but the Department of Environmental Regulation should require a continuing research program to assess whether the target amounts predicted by the model were adequate. The development of this model, he argued, was symptomatic of an unfortunate tendency to separate technical issues from policy issues. "The technical question is, can this be done; the policy question is, will this be done?"[32]

A month later, Parks wrote to the Department of Environmental Regulation again about the SFWMD's water quality management plan, arguing that it failed to justify an extension of the Temporary Operating Permit "because it is unlikely to result in nutrient loading rate reductions which are sufficient to meet the criteria established by the modified Vollenweider equation," that is, a 40 percent reduction of phosphorus loading and a 34 percent reduction of nitrogen loading. It was all very well for the SFWMD to establish targets for nutrient load reductions, Parks argued, but it also needed to demonstrate convincingly how it would achieve those levels.[33]

Initially, dairy farmers and sugar growers had little to say about the SFWMD's water quality management strategy. They gave it their tacit approval, a reasonable position considering some of the management options advocated by environmentalists that would have been more costly to them. Later, as drought conditions brought about a resumption of backpumping and public debate about Lake Okeechobee in the mid-1980s, the sugar growers would raise some objections. They criticized the SFWMD's strategy insofar as it did not pinpoint phosphorus as the chemical agent requiring the most stringent controls despite mounting evidence that phosphorus, not nitrogen, was the limiting nutrient in the eutrophication of Lake Okeechobee. Sugar growers also voiced skepticism about developing the Holey Land for water storage, as they eyed this area for future annexation to the EAA. Certainly they found this proposal preferable to taking land out of sugar cane production for water storage, however, so they muted their criticism.[34] As for the dairy farmers, their action in implementing BMPs spoke most directly to their attitudes about the SFWMD's strategy.

There were 24 separate dairy operations in the Taylor Creek/Nubbin Slough basin in the mid-1980s, as well as an additional 12 dairy operations in the Lower Kissimmee Valley plus some beef cattle operations. In keeping with industry trends nationwide, these were large livestock operations that involved concentrated animal feeding stations as well as pasturing of cows. The average dairy farm in the region had about 1,000 cows. The cows were fed a phosphorus supplement to enhance milk production, which the cows were unable to absorb fully, excreting the unabsorbed portion in their manure. Treating and disposing of this animal waste was a challenge. Although some dairy farms employed state-of-the-art livestock waste management techniques, more stringent and systematic controls were needed.[35]

The SFWMD recommended a number of BMPs to the dairy farmers. These included better rotation of cows between pastures, feedlots, and barns to distribute manure more widely; fencing and other measures to keep cows away from watercourses; and various types of "biological nutrient removal," or use of aquatic plants to take up phosphorus that was already in the water. Such aquatic plants were called "scrubbers" or "polishers" since they had the effect of cleansing the water. In particular, there was a need to collect barn wash and direct this phosphorus-laden water through "oxidation/polishing lagoons" for treatment before it was released as effluent to

Lake Okeechobee. The SFWMD even proposed converting animal waste to methane gas for local energy use.[36]

Beginning in 1981, many dairy farmers in the Taylor Creek/Nubbin Slough basin began upgrading their barns to improve treatment of barn wash (water used to rinse out dairy barns). They were aided by a federal grant under the federal Rural Clean Waters Project. For each barn, the federal government supplied 75 percent of the cost in a cost-share arrangement with the dairy farmer, up to a limit of $50,000 per barn. The SFWMD estimated the average cost at $100,000 per barn. Despite this funding shortfall, the dairy farmers were highly motivated to get their barns renovated. By 1987, all but three barns in the Taylor Creek/Nubbin Slough basin had undergone modification under the Rural Clean Waters program, with work in progress on the remaining three. In the Lower Kissimmee Valley, meanwhile, where the state contributed funds to a similar cost-share program initiated in 1986, all 19 livestock operators had signed up for renovation of their barns at a cost per barn of $170,000 by 1987.[37]

Taylor Creek/Nubbin Slough area. (Source: U.S. Army Corps of Engineers, Jacksonville District.)

Despite early skepticism, the state got surprisingly good cooperation from the dairy farmers in implementing the BMPs. State officials favored this approach as a low-cost management option that treated the problem at the source, and the farmers recognized the program's necessity. Although agriculturists benefited from federal and state funding supports, the program rested fundamentally on the farmers' voluntary efforts, which they made largely at their own expense.[38]

BMPs were only a starting point, however. The SFWMD's water quality management strategy called for additional control measures to reduce nutrient loading. District staff maintained that the results of BMPs had to be evaluated before pressing ahead with other, more expensive, engineering solutions such as the Holey Land reservoir. Such a systematic, fiscally conservative approach was standard practice in watershed management, but it carried the risk of doing too little too late. Indeed, the amount of nutrients pouring into Lake Okeechobee continued to exceed target levels in the mid-1980s and water quality monitoring showed that phosphorus concentrations were approaching the highest levels ever recorded. No one knew, of course, how long the excessive nutrient loading could persist before the ecological consequences became severe. Environmentalists argued that water managers, in the face of such uncertainty,

must err on the side of caution, particularly since Lake Okeechobee was so large and central to South Florida's ecosystem.[39]

There were other signs that time was running out. Fishing guides and commercial fishermen reported extensive growths of filamentous blue-green algae on the lake surface. South shore residents complained that their drinking water had acquired a bad odor and taste.[40] Biologists studying the nesting success of wading birds in Lake Okeechobee's marshes found the birds' numbers declining because of damage to the littoral zone. When drought threatened in June 1985, causing the SFWMD to resume backpumping, the Florida Wildlife Federation again threatened to sue.[41] Amid heightening public concern, Governor Graham called for a comprehensive review. He asked the head of the Department of Environmental Regulation, Victoria Tschinkel, to put together a committee. Eager to bridge conflicts surrounding the lake's management, the governor wanted the review to "include consideration of the interests of federal, state and appropriate local government, agricultural and other users, environmentalists and sportsmen and other interests as may be appropriate."[42]

An algae bloom on Lake Okeechobee. (Source: South Florida Water Management District.)

The Lake Okeechobee Technical Advisory Committee (LOTAC), as it became known, made a hurried study and issued preliminary findings in August 1986. LOTAC generally endorsed the SFWMD's approach, including the district's emphasis on BMPs, although it shortened the list of BMPs to just three in order to gain maximum compliance. These included a reiteration of the SFWMD's goal of fencing all animals away from watercourses, noting that about 75 percent of the appropriate land area in the Taylor Creek/Nubbin Slough basin had been so fenced by 1987, much of it under the Rural Clean Waters Project; a prohibition of all direct discharge of barn

wash into surface waters – a goal that was already practically attained in the Taylor Creek/Nubbin Slough basin and within reach for the dairy operators in the Lower Kissimmee Valley; and the implementation of measures to control storm water runoff from high intensity use areas. Ultimately, LOTAC declared, it might prove necessary for all dairy farms in the region to become "confinement dairies," where all runoff from the milking barns would be collected in a reservoir for treatment.[43]

In addition to its discussion of BMPs, LOTAC accepted the modified Vollenweider model as the best available mathematical model for predicting permissible nutrient loading rates. It also affirmed the district's goal of reducing phosphorus loading by 40 percent. LOTAC went further than the SFWMD's water quality management plan, however, in identifying phosphorus as the limiting nutrient. Based on data accumulated since 1980, this conclusion was inescapable. While the amount of nitrogen had leveled off, the amount of phosphorus in the lake had doubled over the period 1973-1984. LOTAC theorized that the lake was losing its capacity to assimilate phosphorus because bottom sediments could no longer bind the mineral. Adjoining watersheds such as the Taylor Creek/Nubbin Slough basin were similarly unable to hold any more phosphorus. One scientist likened the situation to water dripping on a sponge: the sponge absorbed each drip until it became saturated, at which point the water passed right through.[44] It appeared that with background levels in the environment already high, phosphorus increases could soon accelerate. LOTAC recommended an intensified plan of research focusing on phosphorus loading, BMPs, effects of lake levels on biological communities, and downstream impacts of proposed diversions.[45]

Governor Graham turned LOTAC's recommendations into an executive order, promulgated on 23 August 1986. The order outlined more than a dozen action items – mostly research and monitoring – for the Department of Environmental Regulation, SFWMD, and four other state agencies, and it requested the Corps of Engineers and U.S. Department of Agriculture to participate in cost sharing and research efforts. The Department of Environmental Regulation was responsible for overall program coordination, and the agencies were to execute a memorandum of understanding and prepare a comprehensive plan by 1 November 1986. The governor's executive order contained one specific engineering requirement: it directed the SFWMD to coordinate with the Corps of Engineers on completion of a preliminary design for a diversion of waters from the Taylor Creek/Nubbin Slough basin.[46]

The Taylor Creek/Nubbin Slough diversion was not a new proposal; the Corps had recommended it to Congress in 1968, and the governing board of the SFWMD had requested that the Corps develop plans for it in 1979. The general plan was to divert waters from the basin to the St. Lucie Canal, which flowed east to the St. Lucie Estuary. Although the plan held some attraction to citrus growers in St. Lucie County because it would provide an alternative source of irrigation water during drought, it also raised concerns that the polluted water from the dairy farms would degrade the St. Lucie Estuary. After public review of seven alternatives, the Taylor Creek/Nubbin Slough diversion plan had been shelved in 1980. Now that the need to protect Lake Okeechobee appeared urgent, the SFWMD asked the Corps to give the plan further consideration. The project would be costly, primarily because it would involve the acquisition of a lot of private land, but it appeared to offer one of the fastest and most effective means of reducing phosphorus loading.[47]

At the same time, the SFWMD prepared cost estimates and fact sheets for the whole panoply of Lake Okeechobee protection options. The total cost, if all options were implemented, could run as high as $200 million, it suggested. But the SFWMD's current budget for Lake Okeechobee was a mere $4.4 million, and LOTAC-recommended projects for the current year would require an additional $5.2 million. Given the significance of Lake Okeechobee as a state resource, the district sought additional monies from the state's general fund. State legislators were sympathetic. In January 1987, the Senate Natural Resources Committee proposed a "Save Our Lakes" bill that would provide funding for protection and restoration through a documentary stamp tax. The House Natural Resources Committee considered a similar proposal. The SFWMD's Patricia A. Bidol, executive program director, presented the district's plans and cost estimates to the House committee at the end of January.[48]

Meanwhile, at the beginning of January 1987, there was a change of governors. Bob Graham went to the U.S. Senate and Robert "Bob" Martinez replaced him in the Florida statehouse. Governor Martinez, a Republican and former mayor of Tampa, promised to continue his Democratic predecessor's popular environmental programs, including Save Our Everglades and the Lake Okeechobee protection plan. He indicated his support of the proposed legislation to protect and restore surface waters. However, soon after taking office the governor halted progress by the Department of Environmental Regulation and SFWMD in appointing a Lake Okeechobee Science Review Panel as recommended by LOTAC. Apparently, Martinez was responding to concerns by the sugar growers that the people making up the panel were all from out of state. Following the governor's lead, Dale Twachtmann, the newly appointed secretary of the Department of Environmental Regulation, placed a three-month hold on all LOTAC-directed activities by his department. On 11 April, Martinez and Twachtmann, accompanied by Estus Whitfield (who remained in his position as the governor's environmental advisor despite the change in governors) and three other staff, met with the sugar growers in Belle Glade.[49]

Governor Bob Martinez. (Source: The Florida Memory Project, State Library and Archives of Florida.)

Participating on behalf of sugar in this two-and-a-half hour meeting was the industry's Environmental Quality Committee, composed of the six most prominent men in the business – Alex Fanjul, Nelson Fairbanks, Jose Alvarez, John Hundley, George H. Wedgworth, and Joe Marlin Hilliard. Accompanying them were four staff and four consultants. The sugar growers told the governor that they had a history of involvement in environmental issues. Their Environmental Quality Committee, formed in 1963, had addressed the problem of air pollution in the 1960s and 1970s as the industry came under attack for its open-field burning of cane fields. The committee helped to develop regulations to limit open-field burning, and it oversaw technological improvements in the sugar mills so that they met Clean Air Act standards. In 1974, it initiated research on the eutrophication of Lake Okeechobee, and by 1987, it had

completed more than a score of studies through contracts with environmental science and engineering firms. Many of the recommendations contained in these contracted studies, the agriculturists claimed, had appeared in the recommendations by LOTAC.[50]

The Environmental Quality Committee gave the LOTAC recommendations a strong endorsement. It agreed with LOTAC's selection of phosphorus as the limiting nutrient in the eutrophication of Lake Okeechobee. It supported the use of the modified Vollenweider model as a management tool. Finally, the committee approved of three project recommendations by LOTAC: the diversion of water from the S-4 basin on the west side of Lake Okeechobee to the Caloosahatchee River (similar to the Taylor Creek/Nubbin Slough diversion but much smaller), the Holey Land Reservoir project, and a pilot project to investigate the feasibility of Aquifer Storage Recovery. The agriculturalists favored these projects because they saw the necessity of increasing water supply for the EAA in place of backpumping and water storage in Lake Okeechobee.[51]

The sugar growers tried to demonstrate their willingness to compromise, but they also shared some concerns about the SFWMD with the governor. "We are concerned that the District has utilized a fast track approach recently on the Lake Okeechobee matter," their written presentation stated. It seemed that the district's leadership had decided that throwing enough money at these problems would solve them. Perhaps this could be attributed to a desire to put programs into effect before the new governor changed the makeup of the governing board. Most disturbing to the agriculturists, John R. "Woody" Wodraska, who had become chairman of the governing board, continued to make divisive public statements concerning the need to control nitrogen, despite LOTAC's finding that phosphorus was the limiting nutrient.[52]

Although "Big Sugar" was greatly vilified in the public's eye, Governor Martinez decided to go to Belle Glade, a town largely populated by sugar growers and Haitian cane cutters, to consult on environmental policy for Lake Okeechobee. Perhaps because of this trip, Martinez was soon beset by charges that he would not support the pending legislation to protect Lake Okeechobee. On 4 May, the governor felt compelled to issue a statement aimed at correcting the "misunderstanding." Reiterating his support for the initiative to save Florida's imperiled lakes (now titled the Surface Water Improvement and Management bill, or SWIM), he explained that he merely opposed two features of the bill: the establishment of advisory councils to guide each lake's protection program – "new, unnecessary layers of bureaucracy" – and the use of state tax revenues to pay for the program.[53] Both of these features remained in the bill, however, when the state legislature passed the measure and Martinez signed it into law.

The Surface Water Improvement and Management Act marked a turning point after nearly two decades of plodding efforts to prevent the catastrophic eutrophication of Lake Okeechobee. The SWIM Act declared that "the declining quality of the state's surface waters has been detrimental to the public's right to enjoy these surface waters and it is the duty of the state, through the state's public agencies and subdivisions, to enhance the environmental and scenic value of surface waters."[54] The act mandated the establishment of a priority list of water bodies of regional and statewide significance, a list that began with Lake Okeechobee, Lake Apopka, Tampa Bay, Biscayne Bay, Indian River Lagoon, and Lower St. Johns River, and would grow to include 23 other water bodies by 1997.[55] For each listed water body, the law required the appropriate water management district to design and implement a surface water and

Impact of NGS 2022 DATUM & Low Distortion Projections (LDPs) to Mapping & Engineering Projects

Course #10810 - 3 CECs

8:00 am - 10:45 am on 7/25/24

The National Geodetic Survey (NGS) is updating both the HORIZONTAL and VERTICAL DATUMS.
This presentation will depict the impact of Surveying/Mapping, GIS, and Engineering projects based on the design and configuration of the NEW State Plane Coordinate Systems (SPCSs) and the Low Distortion Projections (LDPs). The learning objectives of this presentation will be to have a better understanding of: The principles of the new NGS 2022 Datum & LDPs, The impact of the new DATUMs to various geographic regions after 2022, managing legacy, small-scale & large-scale projects before and after 2022.

Vasileios "Vas" Kalogirou
RPLS, PLS, PS, PSM, LS

improvement (SWIM) plan. It also created an advisory council (in the case of Lake Okeechobee, this was the second incarnation of LOTAC, known as LOTAC II), and it established a SWIM trust fund to provide financial support for planning and implementation efforts mandated under the law.

Scientific understanding of the eutrophication of Lake Okeechobee had progressed from the first study by the U.S. Geological Survey in 1969 to a myriad of studies by federal and state agencies, universities, and consultants in the 1970s and 1980s. The SFWMD had drawn water samples on a regular basis since 1973, and it had expanded its lake monitoring program in 1986 to encompass more than 50 sites in an effort to improve understanding of areal differences in water quality and the influence of the littoral zone and localized inflows. It had also begun to assess the effects of such lake reclamation activities as aquatic weed control and bottom sediment removal. Meanwhile, continuous gauging of phosphorus and nitrogen loading at all major surface water inflow structures around Lake Okeechobee enabled managers to determine the relative effects of different protection options such as the Taylor Creek/Nubbin Slough diversion. By 1987, managers had the requisite science to evaluate an array of potential engineering projects in various combinations, each project bearing an estimated cost, time of completion, and amount of phosphorus that would be subtracted from the total load going into Lake Okeechobee. The SWIM plan that emerged in 1989 included some phosphorus reductions from biological and chemical treatments, as well as implementation of further BMPs, but by and large it involved engineering solutions.[56]

Even before the development of the SWIM plan, scientific investigation had pointed the way to two critical decisions by water managers. The first was their acceptance of the modified Vollenweider model to establish maximum loadings of nitrogen and phosphorus that could be safely discharged into the lake. Modeling results called for reductions of nutrient loadings by 34 percent for nitrogen and 40 percent for phosphorus. When district managers were unable to achieve these reductions, it lent urgency to their request for state and federal support of the effort. Indeed, while nitrogen levels fell, concentrations of phosphorus more than doubled from the mid 1970s to the late 1980s.[57] The second important science-based decision by water managers was to adopt phosphorus control as the primary lake management strategy. Without that direction, water managers might have been faced with a standoff between the nitrogen-producing sugar growers on the south shore of the lake and the phosphorus-producing dairy farmers on the north shore.

But the SWIM plan did not only address water quality; it also recognized the need for action to protect Lake Okeechobee's littoral zone. According to the plan, "the most practical means" to ensure the propagation of littoral zone vegetation and wildlife was the "development of an appropriate regulation schedule." Yet the plan admitted that "the needs of natural systems in the Lake, especially the littoral zone plan communities have not yet been defined." It therefore called for the creation of a "special technical committee" to "define water level requirements of the littoral zone communities." Accordingly, in 1988, the Lake Okeechobee Littoral Zone Technical Group, composed of representatives from the SFWMD, the FWS, the Florida Game and Freshwater Fish Commission, Everglades National Park, the Florida Department of Natural Resources, the Florida Department of Environmental Regulation, and different universities, worked to develop a sense of how much water was needed to protect the littoral zone.[58]

Throughout the 1980s, then, the SFWMD wrestled with important water quality and littoral zone issues pertaining to Lake Okeechobee, using science as a major guide. Especially important in the time period was the realization that phosphorous was the limiting nutrient in Lake Okeechobee, and that concentration levels of the mineral were reaching dangerous proportions. In many ways, this reliance on science and the solutions that were ultimately proposed foreshadowed efforts in the 1990s to restore the South Florida ecosystem. At the same time, some actions taken to prevent the eutrophication of Lake Okeechobee had effects that proponents did not fully consider – another example of the law of unintended consequences. The curtailment of backpumping under the Interim Action Plan, for example, probably saved Lake Okeechobee from hypereutrophication, but it merely moved the problem to the water conservation areas. The gradual spread of cattails and an exotic plant called melaleuca soon began to tell a story of creeping eutrophication of the Everglades, just as algae blooms had alerted people to eutrophication of Lake Okeechobee a decade earlier. As water quality problems worsened in the Everglades, Florida officials proposed a new solution: the purchase of environmentally threatened lands.

Chapter Nine Endnotes

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Chapter Nine Endnotes (continued)

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954-585-0997

Suarez Surveying & Mapping, Inc.
305-596-1799

Survey Data Solutions, LLC
352-816-4084

SurvTech Solutions, Inc.
813-621-4929

T

T2 UES Inc.
407-587-0603

Tectonic Engineering and Surveying Consultants
845-534-5959

Thurman Roddenberry & Associates
850-962-2538

TopoDOT
407-248-0160

TranSystems Corporation Consultants
727-822-4151

Firms Directory

U

UF/IFAS School of Forest, Fisheries, and Geomatics Sciences
352-846-0850

Upham, Inc.
386-672-9515

W

Wade Surveying, Inc.
352-753-6511

Wantman Group, Inc.(WGI)
561-687-2220

WBQ Design & Engineering, Inc.
407-839-4300

Whidden Surveying & Mapping, Inc.
561-790-5515

Winnigham & Fradley
954-771-7440

Woolpert, Inc.
800-414-1045

Z

ZNS Engineering, LLC.
941-748-8080

SOCIAL MEDIA LINKS

LinkedIn = 1,330 Followers

Facebook = 1000 Followers

X = 390 Followers

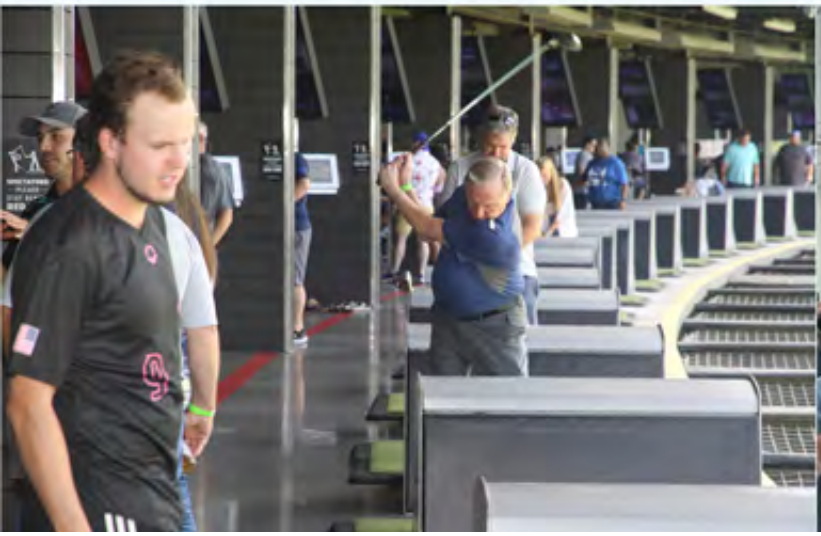
Instagram = 321 Followers

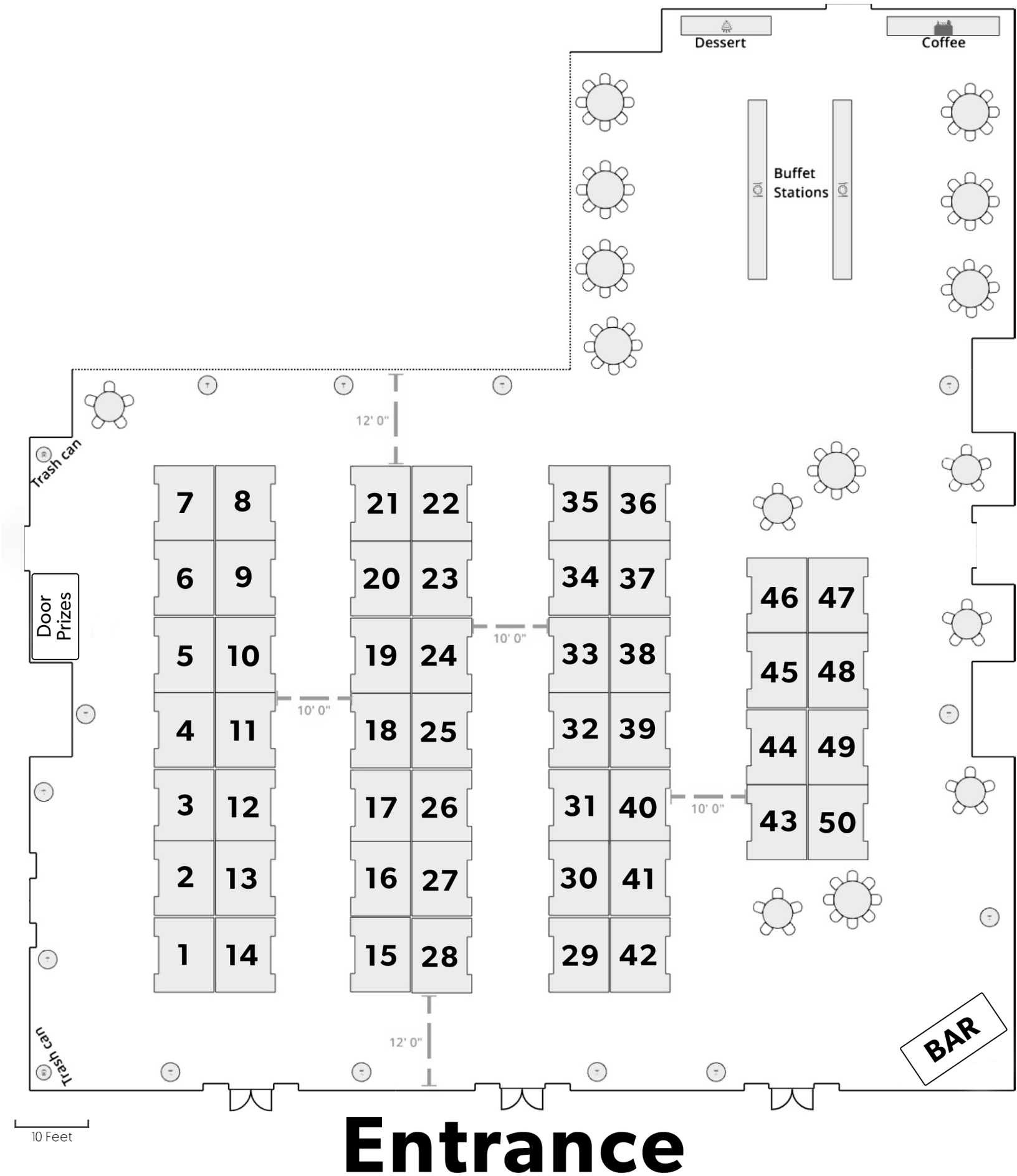
YouTube

EXHIBITOR & SPONSORSHIP OPPORTUNITIES

for the 69th Annual Conference at DoubleTree by Hilton Hotel Orlando at SeaWorld

July 24th – July 27th




Dessert
Coffee
Buffet Stations
12' 0"
Trash can
Door Prizes
7 8
6 9
5 10
4 11
3 12
2 13
1 14
21 22
20 23
19 24
18 25
17 26
16 27
15 28
35 36
34 37
33 38
32 39
31 40
29 42
46 47
45 48
44 49
43 50
10' 0"
10' 0"
10' 0"
12' 0"
Trash can
BAR
10 Feet
Entrance

Exhibitor Opportunities

Only 1 Platinum Exhibitor Allowed. All Other Levels can have Multiple Exhibitors.

PLATINUM EXHIBITOR*

$4,700

SOLD

- Company Name and Logo on a Banner at the Registrat
- Company Bio and Logo in the Conferen ogram Boo
- 1 month free full-page a Florid eyor (Susta Firms eceive an additional month fre orida yor)
- Re he C ence on o Florida Surv
- H age er A FSMS or 2 ns
- Lo th hy ink t bsite yed MS.org
- Co ntary full pa in C ence am Book
- 2 nig mentary l stay
- A Packet tion (des 1 icke hibit Brec , 1 Exhibitor *Luncheon tick ecog n Ba ticke y Seminar CECs*)
- 2 Boo with a p el rop (o let only)
- First p wh oosing (s)
- Opport ak at Welcome BBQ

GOLD EXHIBITOR

$3,500

- Company Bio and Logo in the Conference Program Book
- 1 month free half-page ad in The Florida Surveyor W: 8.5 in. x H: 5.5 in. (Sustaining Firms will receive an additional month free ad in The Florida Surveyor)
- Recognition in the Conference Edition of The Florida Surveyor
- Logo with hyperlink to website displayed on FSMS.org
- 1 night complimentary hotel stay
- A Packet 1 Registration (*includes 1 BBQ Ticket, 1 Exhibitor Breakfast ticket, 1 Exhibitor Luncheon Ticket, 1 Recognition Banquet Ticket, & 6 Saturday Seminar CECs*)
- 5 amp electric power drop (outlet only)
- Second priority when choosing booth(s)
- Opportunity to speak at Welcome BBQ

Exhibitor Opportunities

SILVER EXHIBITOR
$2,000

- Company Bio and Logo in the Conference Program Book
- 1 month free half-page ad in The Florida Surveyor W: 8.5 in. x H: 5.5 in.
  (Sustaining Firms will receive an additional month free ad in The Florida Surveyor)
- Recognition in the Conference Edition of The Florida Surveyor
- Logo with hyperlink to website displayed on FSMS.org
- Third priority when choosing booth(s)
- 2 Welcome BBQ tickets

CONFERENCE EXHIBITOR
$1,500

- Company Bio and Logo in the Conference Program Book
- 1 month free half-page ad in The Florida Surveyor W: 8.5 in. x H: 5.5 in.
  (Sustaining Firms will receive an additional month free ad in The Florida Surveyor)
- Recognition in the Conference Edition of The Florida Surveyor
- Last priority when choosing booth(s)
- Logo with hyperlink to website displayed on FSMS.org

ALL EXHIBITORS WILL RECEIVE:

8’ x 10’ draped booth with 10’ backdrop and 36” side rails
7” x 44” sign provided by Request Only!
6’ draped table, 2 chairs and waste basket
4 name tags for booth personnel per booth
2 Exhibitor breakfast tickets per booth
2 Exhibitor lunch tickets per booth
Attendee List

— Additional Booths can be purchased for $850 per Booth —

Sponsorship Opportunities

ALL SPONSORSHIPS INCLUDE:

- Recognition in Conference Program Book
- Recognition in the Conference Edition of The Florida Surveyor
- Company Logo with Hyperlink to website displayed on FSMS.org

*Only 1 Sponsorship Available — Call for Availability (850) 942-1900

***Conference App Sponsor** **$3,500** - Sponsorship of phone app available for all registrants to download - Company Name & Logo on App	**Recognition Banquet** **$2,700** 2 Sponsors - Sponsorship of Conference Banquet - Full-Page Ad in The Florida Surveyor - Company Name & Logo on Signage	***Room Keys** **$2,500** SOLD - Sponsorship of Room Key Cards given to each Attendee staying at hotel - Company Name & Logo on Room Key Cards
Swag Sponsor **$2,300** 1 Sponsor - Sponsorship of multiple Key Events throughout Conference - Conference/Sponsor Swag for All Attendees - Name and Logo on Swag	***Conference Tote Bags** **$2,300** SOLD - Sponsorship of Tote Bags given to Attendees - Company Name & Logo on Tote Bags	**Exclusive Geo Sponsor** **$2,000** - Company Name and Logo on Signage at the General Business Session & Friday Night Banquet - Full-Page Ad in The Florida Surveyor - Assists in Conference Expenses
***Lanyards** **$2,000** SOLD - Company Name & Logo on Lanyards given to All Conference Attendees	***Name Badges** **$2,000** SOLD - Company Name & Logo on Name Badges given to All Conference Attendees	**Top Golf** **$2,000** - Sponsorship Assists with Top Golf Expenses - Full-Page Ad in The Florida Surveyor - Signage at the Registration Desk - Assists with Food & Beverage Costs
Welcome BBQ **$2,000** 4 Sponsors SOLD - Sponsorship of our Conference Welcome BBQ *(possible networking event)* - 4 Complimentary Tickets - Company Name & Logo on Signage	**Refreshment Breaks** **$1,700** - Sponsorship of Refreshments available during Seminar Breaks - Full-Page Ad in The Florida Surveyor - Company Name & Logo on Signage	***Program Book** (Front Cover) **$1,700** SOLD - Company Name & Logo displayed on front cover
***Program Book** (Back Cover) **$1,500** - Company Name & Logo on back cover	**Banquet Door Prizes** **$1,500** - Sponsorship of Prizes given at Recognition Banquet -Company Name & Logo on Signage	**Casino Night** **$1,500** 3 Sponsors - Company Name & Logo on Signage - Recognition in Conf. Program Book

*Only 1 Sponsorship Available — Call for Availability (850) 942-1900

Sponsorship Opportunities

*Only 1 Sponsorship Available — Call for Availability (850) 942-1900

Legislative Reception **$1,500** 1 Sponsor - Sponsorship for Reception and Guest Speaker - Company Name & Logo on Signage	**Registration Desk & Signs** **$1,500** 3 Sponsors - Sponsorship of Signs at Conference - Company Name & Logo on Conference Welcome Banner at Registration Desk	**Exhibit Hall Breakfast** **$1,200** - Company Name & Logo on Signage - Sponsorship Assists with Breakfast Expenses
Exhibit Hall Door Prizes **$1,200** - Name & Logo on Signage - Company Recognized during Raffle as Sponsor of Door Prizes	**Exhibit Hall Luncheon** **$1,200** - Company Name & Logo on Signage - Sponsorship Assists with Lunch Expenses	**SIT Test Prep** **$1,200** 2 Sponsor - Company Name & Logo on Signage outside of classroom
Cornhole Tournament **$1,000** 2 Sponsors - Company Name & Logo on Signage during Welcome BBQ & Cornhole Tournament	**Golf Tournament** **$1,000** 1 Sponsor - Company Name & Logo on Signage - Assists with Food, Beverage & Prize Costs	**Marquee Speakers** **$1,000** - Sponsorship of Headlining Education Speakers - Company Name & Logo on Signage
***Program Book** (Inside Front Cover) **$1,000** - Full-Page Ad on inside Front Cover of the Conference Program Book	**Exhibitor Welcome Bags** **$950** 2 Sponsors - Company Name & Logo on Exhibitor Welcome Bags	**Cash Bar During Exhibit Hall Luncheon** **$800** - Beer & Soda at 1 Bar in the Exhibit Hall on Friday (Includes 4 Drink Tickets) - Company Name & Logo on Signage
***Program B[illegible]** (In[illegible] Ba[illegible]k Cov[illegible]r) **$8[illegible]** SOLD - Ful[illegible] Pa[illegible] A[illegible] inside Back Cover of th[illegible] Conference Program Book	**CST Exams** **$750** 1 Sponsor - Company Name & Logo on Signage before & during Exam	**General Business Session** **$700** - Company Name & Logo on Signage at & during GBS
Exhibitors Coffee Break **$500** 1 Sponsor - Company Name & Logo on Signage at Afternoon Coffee/Water Break in the Exhibit Hall	**Registration Packets** **$500** 1 Sponsor - Company Name & Logo on Registration Packets given to All Attendees	**Sat. Refreshments Break** **$500** - Company Name & Logo on Signage at All Saturday Seminar Refreshment Breaks
Sat. Seminar Sponsor **$500** - Company Name & Logo on Signage at Seminar of Your Choice	**Young Surveyors Event** **$500** 2 Sponsors - Sponsorship of Special Activity	**General Sponsor** **$300** - Half-Page Ad in The Florida Surveyor

*Only 1 Sponsorship Available — Call for Availability (850) 942-1900

69th Annual Conference Program Book Advertising

◯ 1 full page 5.5” (width) x 8.5” (height)	$200.00
7.5% sales tax	$15.00
TOTAL	$215.00

OR

◯ 1/2 page 5.5” (width) x 4.25” (height)	$125.00
7.5% sales tax	$9.38
TOTAL	$134.38

Program Book Sponsor:
Bowman

_____
Sponsor/Advertiser

_____
Contact Name

_____
Address

_____
City State Zip

_____
Phone Email

Ads must be in .pdf, .jpg, or .png format

We agree to the terms & conditions in the rate schedule.

_____
Print Name Signature

MAIL CHECK AND FORM TO:
Florida Surveying & Mapping Society
P.O. Box 850001-243, Orlando, FL 32885-0243
Email: director@fsms.org

Payment Information:

Check Enclosed_____ AE/Discover/Mastercard/Visa_____

Card Number_____ Card Expiration Date_____

CCV/Card Identification #_____ Billing Zip Code_____

Signature_____

69th Annual Conference Flyer Insert Advertising

Create a Unique Advertising Touchpoint with Your Brand's Flyer!

An additional way to showcase your company at our Annual Conference is through our Attendee Registration Packets. Prepare your company's flyer and ship (200 inserts) to the Administrative Office for arrival by June 15th.

◯ Cost - **$100** (choose one)

Or, FSMS can print your flyers on letter size copy paper (8.5" x 11") with B & W print

◯ Cost - **$200** (choose one)

MAIL CHECK AND FORM TO:

Florida Surveying & Mapping Society
P.O. Box 850001-243, Orlando, FL 32885-0243

Email: director@fsms.org

We agree to the terms & conditions in the rate schedule.

_____
Company Contact Name

_____
Signature

_____
Address

_____
City State Zip

Method of Payment: Check _____ Credit Card(AE/Discover/MasterCard/Visa) _____

Card # _____ Exp. Date _____

CCV/Card Identification # _____ Billing Zip Code _____

Email _____

THANK YOU

To All of Our Exhibitors and Sponsors

EXHIBITORS

PLATINUM

Duncan-Parnell

Duncan-Parnell is an authorized Trimble dealer for land survey, mapping/GIS, and construction instruments and accessories, and has been the leading provider of survey & mapping solutions in Florida for over 25 years. Our product offerings include GNSS receivers, drones/UAVs solutions, robotic and manual total stations, software for workflow integration, digital and automatic levels, 3D laser scanners, mobile mapping and monitoring solutions, utility locating equipment (GPR), construction lasers, as well as a full range of field supplies and accessories. Duncan-Parnell is your full field-to-finish provider. Our Geospatial team has decades of industry experience, certified maintenance centers, and experienced trainers on staff. We're ready to be a trusted partner and assist with your sales, rental, or maintenance needs. Contact us today!

Duncan Parnell
Successful Projects Start Here

EXHIBITORS

GOLD

Big Sky Aerial Solutions

Big Sky Aerial Solutions is a leading LIDAR and specialized aerial data collection organization with advanced sUAS capabilities. Our focus is on meeting the specific requirements of professional licensed surveyors and engineers through tailored solutions. Collaboration lies at the heart of our approach, where we seamlessly integrate your expertise into our deliverables. Founded on safety, accuracy, and efficiency, Big Sky utilizes cutting-edge technology and specific Federal Aviation Administration operational waivers, including Beyond Visual Line of Sight (BVLOS), as we maintain the utmost due diligence. We can assist surveyors from a simple orthomosaic photo overlay to complex surface development on large, expansive, and heavily vegetated projects.

Caulfield & Wheeler, Inc. (CWI)

Caulfield & Wheeler, Inc. (CWI) was incorporated in October of 1982 in Palm Beach County, Florida. Its principals and employees provide professional Civil Engineering, Planning, Land Surveying, Landscape Architecture, 3D Laser Scanning, and Unmanned Aerial Systems services. CWI has been contracted by many prestigious municipalities, developments, and governmental agencies throughout Florida. CWI's principals have over 200 years of combined experience serving as active project managers, ensuring every project meets our technical quality standards while remaining within the client's budget and schedule.

EXHIBITORS

SILVER

American Government Services Corporation

American Government Services (AGS) is a full-service title company that specializes in providing real estate services to government agencies. AGS has been providing title and closing services in the State of Florida since 1979. American Government Services is a 100% women-owned business, certified as a DBE/MBE firm with the State of Florida and registered as a real estate broker corporation with the Florida Department of Business and Professional Regulation. AGS hopes to meet and exceed all of your Title service needs.

Atwell, LLC

Atwell, LLC is a national consulting, engineering, and construction services firm with offices throughout the country that deliver a broad range of strategic and creative solutions to clients in three core markets: real estate and land development, power and energy, and oil and gas. Atwell provides comprehensive turnkey services including land and right of way support, engineering, land surveying, environmental compliance and permitting, and project and program management. We are pleased to announce that effective January 2024 the Fort Myers and Port Charlotte offices of Banks Engineering have merged with Atwell, LLC.

EXHIBITORS

SILVER

Frontier Precision Unmanned

Frontier Precision Unmanned has the latest innovations in drone aircraft and sensors to fit your job or application. We offer industry-leading products and software from Ascent AeroSystems, Autel Robotics, Censys Technologies, DJI, Freefly Systems, Inspired Flight, Parrot, Quantum-Systems, Watts Innovations, YellowScan, Emesent, Deep Trekker, Phase One, FLIR, Pix4D, and many others to make sure you get the right product for the right UAS application. UAS applications include geospatial surveying & mapping, agriculture, construction, energy, forestry, infrastructure, mining, mosquito & vector control, oil & gas, and public safety.

Leica Geosystems

Leica Geosystems – when it has to be right
With more than 200 years of history, Leica Geosystems, part of Hexagon, is the trusted supplier of premium sensors, software and services. Delivering value every day to professionals in surveying, construction, infrastructure, mining, mapping and other geospatial content-dependent industries, Leica Geosystems leads the industry with innovative solutions to empower our autonomous future.

EXHIBITORS

SILVER

Navigation Electronics, Inc. (NEI)

Navigation Electronics, Inc (NEI) is a woman-owned small business, with Barbara Poche serving as President & CEO. NEI is a Trimble Geospatial solution provider in the Southeast and has been in business for 35 years. NEI represents Trimble as its' premier product line distributor and has been a Trimble distributor since 1990. We are committed to excellent customer service and have a long history of customer satisfaction.

NEI has assembled a team of professionals, each having unsurpassed expertise in various areas of Surveying. NEI currently has three licensed land surveyors on staff, two GIS professionals and three Part 107 pilots on staff. These individuals will ensure that all components of this bid will be addressed to complete satisfaction. NEI's corporate headquarters, a state-of-the-art facility in Lafayette, LA and has over 100 years of service experience. This facility is complimented by a training center and sales office in Duluth, Georgia. NEI also maintains satellite offices in Florida, Mississippi, Alabama, and Arkansas.

R-E-A-L.iT

R-E-A-L.iT is a leading provider of customized reality capture workflow solutions for clients across diverse industries. Established by Derek deBlois in 2021, our company has rapidly evolved to become a trusted partner for businesses seeking innovative solutions in industries like engineering, architecture, public safety, visual effects (VFX), and more. At R-E-A-L.iT, we are dedicated to delivering comprehensive reality capture solutions, expert consulting, and tailored software development to address the unique needs of our valued clients.

EXHIBITORS

SILVER

TopoDOT

TopoDOT is a point cloud processing software application offering a comprehensive feature extraction tool suite with the right balance between automation and quality assurance. TopoDOT offers a well-documented process to extract Digital Twin deliverables such as topographies, assets, 3D models, measurements, analyses, and reports meeting the highest quality-controlled standards. Our TopoShare product provides a comprehensive process to organize, store and share your data across operations at the lowest possible cost. TopoDOT LLC is headquartered in Winter Garden, Florida.

EXHIBITORS

STANDARD

The Arc of Bradford County

At The Arc of Bradford County, we are committed to helping people with intellectual and developmental disabilities live full and rewarding lives.
Founded in 1975 on inclusion and acceptance, we work tirelessly to ensure the individuals we serve receive the care and attention they deserve. Everyone has something valuable to contribute to society, and we are committed to helping our participants realize their full potential.

Bowman Consulting

Bowman is a trusted, multi-disciplinary consulting firm offering a broad range of real estate, energy, infrastructure, and environmental management solutions to both public and private clients across the country. From large commercial developments, to master planned communities, to local transportation projects, Bowman delivers outstanding project results, builds long-lasting relationships and leverages the growth of our organization to serve the constantly changing needs of our clients.

As a result of systematic corporate planning and diligent implementation, our dynamic leadership has focused on strategic expansion that has resulted in a national project portfolio and opportunities to increase our geographic presence for both new and existing clients. Bowman offers on-demand technical genius and industry-leading talent that, when combined, produce innovative and effective results.

EXHIBITORS

STANDARD

CARLSON

Carlson Preferred Solutions is the exclusive Carlson Software Authorized Dealer for the state of Florida. Specializing in Carlson centric GNSS RTK base and rover solutions, total stations, RTK drones, data collection hardware & software, and CAD software to the Land Surveyor, Civil Engineer, and Construction professional.

CARNAHAN PROCTOR & CROSS

CPC is proud to celebrate its 46th year as a full-service geomatics firm. As surveying technologies advance, CPC is a leader in utilizing cutting-edge technology, equipment, and software. CPC is involved in a wide variety of information-gathering activities and applications to design, develop, and operate systems for collecting and analyzing spatial information. Our Geomatics group utilizes technologically advanced tools like robotic total stations, global positioning system (GPS) equipment, digital aerial imagery, 3D Terrestrial Laser Scanning, Building Information Modeling (BIM), computer-based drafting and design (CADD), and geographic information systems (GIS) to provide clients with the most cost-efficient and innovative solutions.

CHC Navigation USA

CHC Navigation is a global leader in navigation, positioning, and mapping solutions for various professional applications. Our offerings include surveying, GNSS technology, 3D data collection, precision agriculture, unmanned navigation, real-time GNSS infrastructure, and more. With a commitment to technology advancement and affordability, we serve geospatial professionals in over 120 countries.

EXHIBITORS

STANDARD

CTS Engineering

CTS Engineering, Inc is a well-known and respected leader in providing Professional Engineering services throughout the State of Florida for over 12 years. We offer a wide array of services to our clients including transportation planning, traffic engineering, public transit support, roadway design, policy planning, data collection, statistical analysis, PD&E studies, multimodal improvements and surveying and mapping services. Our team of Professional Surveyors & SUE experts have provided high quality deliverables for Surveying & Mapping assignments to our clients including utility coordination to many FDOT Districts, Counties and Cities. CTS is a certified DBE firm with offices throughout the state to support all your Surveying, SUE & Utility Coordination needs. CTS will provide a turnkey package of all these services.

Dorado Graphix

Dorado Graphix LLC is your go-to source for all large format printing, laminating, scanning equipment, and their associated software and supplies. We have media for every application from CAD Bond, to photo grades, to outdoor banner material and much more. We service everything we sell and some that we don't. Dorado Graphix is a veteran owned company and we pride ourselves on providing quality products, service, and training for our customers. Please call us at (904) 751-4500 or visit our website www.doradographix.com.

EXHIBITORS

STANDARD

DUKE ENERGY

Duke Energy is a Fortune 150 company headquartered in Charlotte, N.C., is one of America's largest energy holding companies. The company's electric utilities serve 8.4 million customers in North Carolina, South Carolina, Florida, Indiana, Ohio and Kentucky, and collectively own approximately 54,800 megawatts of energy capacity. Its natural gas utilities serve 1.7 million customers in North Carolina, South Carolina, Tennessee, Ohio and Kentucky.

Duke Energy is executing an ambitious clean energy transition to achieve its goals of net-zero methane emissions from its natural gas business by 2030 and net-zero carbon emissions from electricity generation by 2050. The company is investing in major electric grid upgrades and cleaner generation, including expanded energy storage, renewables, natural gas and nuclear.

eGPS Solutions

At eGPS Solutions, we are a full-service survey equipment and supplies distributor. At the best prices, we sell top-quality equipment from GeoMax, CHC, DJI, and LiDARUSA to create unique solutions to fit your surveying needs. We also provide comprehensive services to fully support our customers, including supplies, M2M data plans, certified repairs, technical support, and UAV-LiDAR training, all just a phone call away. So look no further than us for all your surveying needs because, at eGPS Solutions, we will not let you fail.

EXHIBITORS

STANDARD

FAU Florida Atlantic University

The NCEES award winner, Florida Atlantic University Bachelor of Science degree in Geomatics Engineering is one of the state-of-the-art ABET accredited engineering programs in the nation. The award-winning faculty has outstanding teaching and research experience and diverse professional backgrounds. Students can collaborate with other engineering and science disciplines such as geosciences, computer science, urban planning, and other fields. While this program prepares students for the Professional Land Surveyor (PLS) license, some students successfully pass the NCEES Fundamentals of Surveying (FS) and Fundamentals of Engineering (FE) examinations before graduating from the program.

Florida Aerial Survey Technologies (FAST)

Florida Aerial Survey Technologies (FAST) excels in swiftly delivering high-quality aerial survey and mapping data through advanced methods including LiDAR and photogrammetry. Our team's extensive experience in drone-related software development has led to the creation of proprietary survey software and systems. These innovations significantly reduce project timelines while maintaining data integrity, establishing FAST as the aerial surveying market leader in Florida.

FLT Geosystems

FLT Geosystems (Florida Level & Transit) is a full-line dealer for Leica Geosystems (optical, GPS, HDS scanning, & lasers), Topcon Positioning (optical & lasers), Spectra Precision (optical, data collectors, & lasers), Carlson Software, Septentrio, and many more. Our home office is in Ft. Lauderdale, with a full-service office in Tampa.

EXHIBITORS

STANDARD

FOUNDATION RISK PARTNERS

FRP Professional Risk offers a unique combination of industry leaders and data-driven professionals, leveraging their expertise to provide tailored insurance and risk management solutions for our customers. Our team of more than 30 professionals collaborates to unburden our clients from risk through education, insurance, and counsel. No matter the size of your firm, our service is designed to meet your needs.

Florida Resources & Environmental Analysis

The Florida Resources and Environmental Analysis Center (FREAC), established in 1969, is the original center within the Institute of Science and Public Affairs (ISPA) at Florida State University (FSU). FREAC professionals conduct research in the general areas of resource management and environmental analysis, as well as provide advice and technical assistance to state and local agencies. Public lands research and analysis, geographic information system development, and graphic representation of digital databases are current and long-range FREAC research interests. FREAC also trains university students in these areas through direct involvement in projects, providing real-world experiences.

EXHIBITORS

STANDARD

GeoNetworking

Geo Networking is a Topcon/Sokkia distributor located in central Florida. The company focuses on end-to-end sales through a consultive sales strategy. In this process, Geo Networking is able to match the right product to meet your team's goals for your deliverables. Geo Networking is proud to offer the Quantum Systems line of drones that include the Trinity Pro and a powerful line of sensors with LiDAR options. We are also excited to welcome FARO to our lineup of terrestrial scanners. The all new Orbis is a handheld SLAM scanner that is really making waves in the mass data capture arena. These products matched with the very well known products from Topcon/Sokkia make any job a slam dunk.

GPI Geospatial, Inc.

For fifty years, GPI Geospatial, Inc., a subsidiary of Greenman-Pedersen, Inc., has delivered advanced geospatial services in both public and private sectors throughout the eastern United States. Our comprehensive offering of professional surveying and mapping services caters to engineers, architects, land developers, planners, and a wide range of both public and private markets, such as energy, transportation, and private development. GPI Geospatial provides the most accurate remote sensing and survey data by utilizing specialized aircraft, vehicles, and personnel outfitted with cutting-edge equipment and software. Our unwavering commitment to precision, innovation, and client satisfaction has earned GPI Geospatial an unparalleled reputation, making them the preferred firm of choice for those seeking unrivaled geospatial solutions tailored to their needs. Our team is comprised of dedicated subject matter experts and support staff, many of whom are licensed Land Surveyors, ASPRS Certified Photogrammetrists and Mapping Scientists, GIS Professionals, FAA Licensed Pilots, and Project Management Professionals.

EXHIBITORS

STANDARD

Geospatial Users Group

The Geospatial Users Group is a practice section of FSMS that facilitates Communication and Outreach between practitioners, experts, suppliers, and users of GNSS and their applicable systems. Its purpose is to act as a central voice to protect the accessibility and provide education of such systems. The Group promotes education, outreach, and information to act as a liaison between users and the various industries interacting with GNSS and advanced geomatic positioning based systems.

Kompass BMS

Kompass BMS is a fully integrated software system designed to streamline business operations for surveying & engineering companies. Developed by surveyors for surveyors, it includes an intuitive dashboard, a robust CRM, project mapping, crew scheduling, timesheets, expense reporting, and real-time visibility. The platform provides powerful features to improve collaboration, project financials, and the sales process, enabling companies to efficiently manage and grow their business.

EXHIBITORS

STANDARD

Kucera International, Inc.

Kucera International, Inc. is a leading provider of aerial remote sensing, lidar processing/classification, photogrammetric mapping, orthoimaging, CAD and GIS conversion and support, and related services for surveying/engineering, government, industrial/commercial, and educational/research applications. Kucera's in-house staff of over 60 experienced geomatic professionals working at offices in Florida, Ohio, and Pennsylvania includes licensed/certified photogrammetrists, surveyors, engineers, GIS/CAD specialists, project managers, pilots, and aircraft mechanics. For aerial data acquisition, Kucera maintains a fleet of high-performance, multi-port manned aircraft outfitted with latest generation aerial lidar, digital aerial imaging, and multispectral sensing systems integrated with advanced airborne GPS/IMU georeferencing technologies. For data processing, mapping, conversion, and support, Kucera uses a variety of robust, proven remote sensing, photogrammetric, imaging, and GIS and CAD technologies/software. Kucera regularly works throughout Florida, the Caribbean region, and other areas of the U.S. Kucera is a long-standing Florida professional surveying and mapping firm and a sustaining member of ASPRS.

L & S Diversified

L&S Diversified is a fully integrated firm positioned to design, survey, map, model, and designate utilities for governments, businesses, and organizations in the state of Florida. We provide surveying and mapping, construction surveying, LiDAR, GIS and subsurface utility engineering to the transportation, private development, environmental, energy, and government markets.

EXHIBITORS

STANDARD

LENGEMANN

Established in 1962, Lengemann Corporation is celebrating 60 years of meeting customer needs. Lengemann Corporation is one of the leading Topcon and Sokkia full line surveying instrument dealers in the United States. We sell/rent/finance GPS, Robotics, Total Stations, Drones, Machine Control, and supplies. Lengemann Corporation is the only authorized Topcon and Sokkia master repair facility in the state of Florida. We also operate one of the largest, privately owned GPS networks in the U.S. called L-Net. Our new onsite training facility is equipped for all your survey and machine control needs.

McKIM & CREED

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EXHIBITORS

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The UF Geomatics program was established in 1973 and is the preeminent Geomatics program in Florida. Consisting of six full-time faculty members, 80 Bachelor's degree students, 19 graduate students, and boasting two remote educational facilities in Ft. Lauderdale and Plant City, it has become the premier and leading resource for students seeking a degree in Geomatics from one of the country's most prestigious institutions. The UF Geomatic Student Association (GSA) is an active student chapter of the Florida Surveying & Mapping Society (FSMS) and has been a regular Exhibitor at their Annual Conference for many years, providing GSA members the opportunity to interact with FSMS members, gain inspiration and professional Awareness, as well as increase visibility of the GSA and UF Geomatics program to prospective students.

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This project was done before GPS (1979) so we will cover the use of a Litton inertial guidance system for control; the search for witness trees; proving section corners; doing the solar observations for control traversing; and the data results found.

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FACES ON THE FRONTIER

FLORIDA SURVEYORS AND DEVELOPERS IN THE 19TH CENTURY

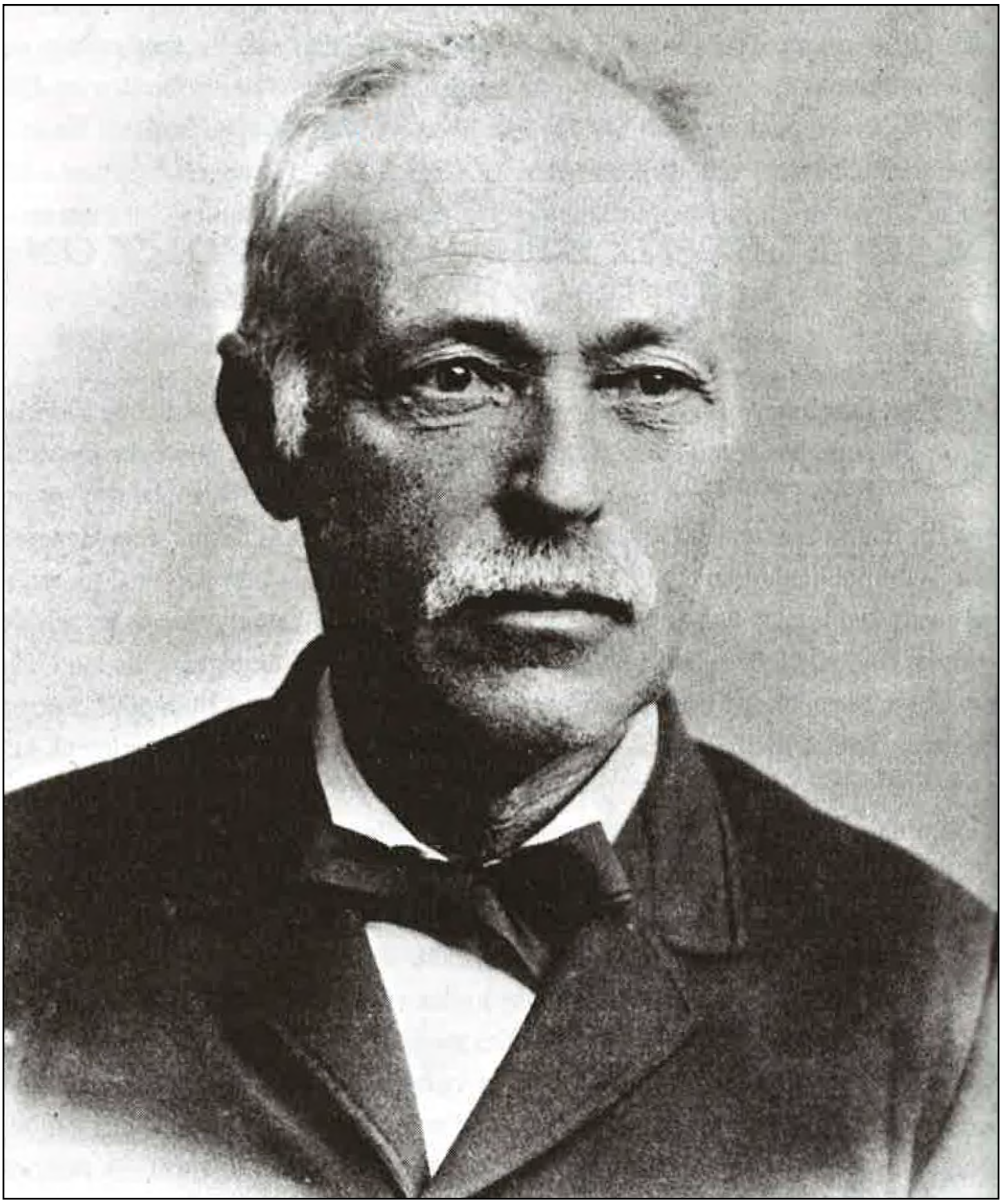
by Dr. Joe Knetsch

CHAPTER 9

MARCELLUS L. STEARNS' REPORT ON SOUTH FLORIDA: 1872

Of the many offices held by Marcellus L. Stearns in Reconstruction Florida, none has received so little attention as his tenure as Surveyor General. From 1869, when the office was recreated, until 1873 when he was sworn in as the State's Lieutenant Governor, Stearns served Florida as its Surveyor General. This was a political plum with tremendous responsibilities and the potential for making costly errors. He had to chose a whole new group of Deputy Surveyors whose work he could trust to be accurate and honest. Stearns had to recreate the land history of the State, clear titles, administer a complicated office and attempt to oversee the surveys of southern Florida. The job may have been a political appointment, but it was not a simple sinecure.

Stearns' origins were in the state of Maine, where he was born on April 29, 1839, in the hamlet of Center Lovell. His family had very distinguished Revolutionary War patriots in its line and some of his relatives stated that Marcellus closely resembled one, Major Benjamin Russell. Stearns received his higher education at Waterville College (now Colby) after attending its preparatory school, Waterville Academy. There he enjoyed the social life of the campus joining Delta Upsilon fraternity and being generally popular with his classmates, one who described the future Florida Governor as, "one of those frank, cordial, genial, open-hearted, whole-souled fellows whom



Marcellus Stearns

(Florida State Photographic Archives)

everybody likes to meet—a man of integrity always ready for honest work." However, because of the times, the beginning of 1861, he did not complete his course of studies and entered Company E, Twelfth Maine Volunteer Infantry. He enlisted as a simple private.

The regiment was soon organized and Stearns was promoted to the rank of sergeant. This was quickly followed by an advance to the rank of lieutenant in June of 1862. After some preliminary training in the rudiments of military life, his unit was sent southward to the Department of the Gulf. Ironically, he was given, for a very short time, the command of the Federal schooner *Hortense* which patrolled the waters of Louisiana's Lake Ponchartrain. After some heated military service in the campaign against Port Hudson on the Mississippi River, he was transferred to the Army of Northern Virginia. At the Battle of Winchester, now serving as a First Lieutenant and in the forefront of the fighting, he saw many of his superior officers wounded. Taking the initiative, he led the troops in a series of charges, in which he was severely wounded. For his valiant efforts he lost his right arm and was placed on reserve status.

Two activities dominated the life of Marcellus Stearns during this period. First, he began to study the law with Judge Josiah H. Drummund in Portland, Maine. The judge was an excellent teacher and encouraged Stearns in his studies, which he continued after he had begun his second activity, namely taking a position in the newly formed Bureau of Refugees, Freedmen, and Abandoned Claims. This new activity took him to Wheeling, West Virginia and then to Quincy, Florida, where he headed the local office. After six months in Quincy, he was admitted to the Florida Bar and became active in local Republican politics.

The logical step from the Freedmen's Bureau into the maelstrom of Republican politics was quick and important for Marcellus Stearns. He quickly rose into prominence and became a delegate to the first state-wide Republican convention in July of 1867. Early the next year, he served as a delegate to the Constitutional Convention. His political fortunes continued to rise until, in 1869 he won election to the newly constituted Florida Legislature as the representative of Gadsden County. In the following year, he was elected to speaker and became the only speaker in Florida history to preside over seven sessions of the Legislature, including extra sessions. He

held this post until 1872. It is interesting to point out that he received his appointment as Surveyor General of Florida in 1869. It was not uncommon for politicians of that day to hold more than one appointment.

Stearns' life after his tour as Surveyor General is probably more important than his life prior to it. After a run at the governorship at the Republican convention in 1872, where he actually received the majority of votes on the first day, he settled for the post of lieutenant governor under the leadership of Ossian B. Hart of Jacksonville. Both men were considered political moderates and opposed to the Radical faction. Indeed, Stearns, as Speaker of the House, led the move to impeach Governor Harrison Reed and opposed the machinations of Dade County resident William Gleason. Unfortunately, Governor Hart died shortly after the legislative session of 1874 and Stearns became acting-governor. As acting-governor, Stearns was involved with the unusually delicate and complex politics of Reconstruction Florida. He was opposed by many of the former Radical faction and many of the leading Afro-American politicians, especially John Wallace, the author of the book, *Carpetbag Rule in Florida* in which Stearns is the leading villain. He also had to conduct the negotiations with the representatives of the Francis Vose estate, whose suit against the Board of Trustees of the Internal Improvement Fund, of which the governor sits as chairman, had tied up state-owned lands from being used for the benefit of promoting canals and railroads since 1872. The short-lived acting-governorship of Marcellus Stearns was anything but smooth and successful.

In 1876, Stearns ran for the governorship, but failed against the Democratic candidate George F. Drew. As happened throughout the nation in this election, the results were questioned everywhere and the campaign itself was very "tumultuous." Having been bitterly disappointed in his race for the governorship, President Hayes appointed him as United States Commissioner at Hot Springs, Arkansas. The next year, in a more pleasant set of circumstances, he married Ellen Austin Walker of Bridgewater, Massachusetts. Although he held different posts in different areas for many years, he did not relinquish his home in Quincy, Florida. He was, for example, president of the Atlantic National Bank in Atlantic Iowa, from 1887 until ill-health forced his retirement in 1890. He also remained active in his law practice until the very end of his days. His final move was to Palatine

Bridge, New York, where his wife's father was the minister of a local church. While preparing to head south for the winter of 1891, Marcellus L. Stearns expired on December 8. On his tombstone is listed what he considered his greatest accomplishments—the next to the last line begins, "US Surv-Gen."

With the above introduction to Marcellus Stearns completed and for a better understanding of the report that follows, it would be worth a short look at the Deputy Surveyors appointed by the Surveyor General to carry out the difficult task of measuring, platting and describing southern Florida. J. Angus MacDonald was a New York born surveyor, engineer, real estate promoter and part-time farmer in many areas of Florida, including Dade County in his later life. The special contract noted for MacDonald was for a survey of the Wekiva River in today's Seminole County. Samuel Hamblin was a neighbor of Stearns' from Quincy who had some previous experience in surveying in the north. William Lee Apthorp, a graduate of Amherst, was a surveyor, a clerk in the office of the Surveyor General of Florida and a mapper. Apthorp also had some experiences in the Civil war, rising from Corporal to Lieutenant Colonel just prior to his discharge. He is best known for his 1877 map of Florida. His descendants have been active in the Historical Association of Southern Florida for many years. Charles F. Smith had some years as an engineer and practical surveyor in the north before heading to Florida. His surveys were some of the toughest to perform, especially his attempt to survey the area of today's Citrus County, where he quite frankly got lost and turned in what proved to be a contorted survey that is still in effect as the last official work in that difficult vicinity. The final surveyor noted by the following report is Marcellus Williams. Williams was born in North Carolina and migrated to Florida sometime in the 1840s. He began his career in surveying as a member of the crew of Arthur M. Randolph in 1847 and received his first contract for surveying in 1851. He is best known in Florida history as the leading name in the famous real estate firm of Williams, Swann and Corley, which handled much of the State's land business in the confused and frustrating 1870s. Of the group appointed by Stearns, Williams had the most experience surveying in Florida.

As the Surveyor General, Marcellus Stearns was required to report on the progress of the surveys carried out under his yearly appropriation. This meant a synopsis of the work done in the field by the Deputy Surveyors and

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the expenditures of the official staff. Each surveyor working under Stearns received his pay in dollars per mile of lines run and the contracts specified just how many miles each was estimated to be able to run in the area assigned for survey. The surveyors were required, in turn, to run the lines in the field, make out their field notes, draft a plat of the survey (although this is not the final plat filed in the land office) and submit an accounting of all expenses required to make the survey, including the wages paid to each member of the crew. Before any surveyor could be reimbursed for his expenses and paid for the work completed, he had to submit all of the above for the approval of the Surveyor General, who, if he approved these items, would send it on to the Commissioner of the General Land Office, whose staff would either approve or reject the accounts submitted. All of this work, both by the surveyor and his superiors, required time, often as much as a year to two years. Trouble in the field, e.g. snake bite, illness, etc., would require a request for an extension of time to complete the contract. Incorrect field notes or poor accounting would mandate a rejection of the work until the mistakes were corrected, again causing the surveyor much delay in getting reimbursed for his efforts and expenditures. For the surveyor to get his pay on schedule required the proper directions and support of the Surveyor General. In this aspect of the job, Marcellus Stearns appears to have been a fairly efficient administrator.

Because the majority of the remaining surveys to be run in Florida were those in the most southern region, the reports of the Surveyor Generals indicate the tasks facing the surveyors and the nature of the land which was to be measured. With the exception of MacDonald's work, all three of the deputies hired in the 1871-72 surveying season performed their duties in the southern portion of the State. The work was known beforehand to be very difficult, dangerous and, in some cases, impracticable. The land was basically that found in the Everglades, coral rock and peat bogs covered with grass and other vegetable matter. When they were not working in this type of environment, they faced true swamps and scattered cypress hammocks, called "islands" in the Everglades. The crews faced mosquitoes, snakes, flies, alligators and any other creature imaginable found in South Florida, including the now nearly extinct Florida panther. The task of surveying in this challenging environment was formidable.

What follows is the report written by Marcellus Stearns covering his office

duties and accomplishments for the year ending in mid-1872. Aside from the administrative detail found herein, the descriptions of the territory of southern Florida, the life-style of the Seminoles, from the white man's perspective, and the physical difficulties of life on the Florida frontier make for some rather interesting and informative reading. The document from which this is transcribed can be found in the Quarterly Reports of the Surveyor Generals Office, Land Record and Title Section, Division of State Lands, Florida Department of Environmental Protections, located in Tallahassee, Florida.

Surveyor General's Office
Tallahassee Florida
September 25th 1872
Hon. Willis Drummond
Commissioner General Land Office
Washington D C

Sir

In compliance with your instructions of April 5th, I have the honor to submit for your consideration the following report of surveying operations in this district during the fiscal year ending June 30th 1872, together with tabular statements [not found] of office and field work.

Surveys

All the field work undertaken during the present year has been completed and the work reported to this office, excepting the special contract of Deputy Macdonald.

Contract No. 8 made with Deputy Samuel Hamblin was the first contract for the year, the Deputy took the field about the middle of December and returned his work to this office the 16th day of May following, as his work North of the Caloosahatchee River exceeded the estimate for the whole, no work was done by him South of the River, the office work was completed and the duplicate plats and transcribed field notes, with accounts of deputy forwarded to the General Land Office on the 22nd day of July.

I contracted with Deputy Wm. Lee Apthorp on the 23rd day of December for the survey of a Standard Meridian Line, from the Caloosahatchee River

South as far as practicable for the survey of a Correction Parallel between Townships 46 & 47 South running East from the Meridian Line to Lake Okechobee or to the marshes of said Lake, and that from said line to the Gulf of Mexico. Also for the survey of Township Lines embraced within the above mentioned lines until he should have run five hundred and sixty three miles of Township Lines, owing to some unavoidable delays, the deputy did not get into the field until some time in March, the season being so far advanced he failed to make his full amount of miles before the rainy season set in; which drove him from the field. His work was reported July 1st and the diagrams and transcribed field notes together with his accounts were forwarded to the General Land Office July 31st.

Contract No. 10 dated July 3d 1872 with Deputy M.A. Williams for the survey of Key Largo and adjoining Keys was reported July 6th, the Office work is now being pushed forward as rapidly as possible and will soon be completed and forwarded.

Contract No. 11 with Deputy Macdonald for a special survey has not been returned, nothing has been heard from the deputy so no reasons can be assigned for the delay.

The contract made with Deputy M. A. Williams for the survey of Township 45 South Ranges 41, 42 & 43 East and Township 46 South Range 41 East, contract dated 24th of April 1871, afterwards extended to March 1st 1872 and again to June 1st. was reported to this office June 1st. The office work was delayed for some time on account of some irregularities in the notes and as the Deputy's whereabouts at this time was uncertain no communication could be got to him. The office work is now completed and the duplicate plats and notes will be sent forward as soon as examined and approved.

Contract No. 7 with Deputy Chas. F. Smith which was to have been executed by Aug. 1st 1871 and which was extended to April 1st 1872 has not been executed under date of April 1st. I received a letter from the Deputy asking that the contract be cancelled as Mr. Westcott [a former Surveyor General of Florida], the party interested, had failed up to that time, to furnish the required data to enable him to locate the grant, though repeatedly solicited for such data. I would therefore recommend that the contract be cancelled, thereby

relieving the deputy from any further responsibility in the matter.

Character of Country Surveyed

The country North of the Caloosahatchee River surveyed by Deputy Hamblin is generally pine, some small Hammocks on the River in Range 26 which he reported as very rich and susceptible of cultivation.

West of Range 25 and between the mouth of Pease Creek [River] and the Caloosahatchee River the pine lands are of good quality high and somewhat rolling, well timbered, little or no saw-palmetto, and being below the frost line are of very great value for raising tropical fruits, the soil is good and of considerable depth. Sea Island cotton was found growing wild in many places, the plant looked well and was heavily fruited.

South of the river, the coral rock comes very near the surface though there is a very large quantity of good merchantable pine growing in this region which is growing more valuable every year, the soil is suitable for pine apples and small fruits. The settlers at Fort Myers raise some Oranges, but to protect the trees from being blown over by heavy winds on account of the thinness of the soil, they place heavy timbers around them at a distance of four or five feet from the body of the tree. The Orange grown here is large and juicy and is excelled by none.

There is a considerable settlement at Fort Myers mostly interested in stock raising. The number of cattle south of the river is estimated at seventy five thousand (75,000) head. The prairie and saw grass bordering Lake Okechobee furnishes excellent pasture and is good at all seasons of the year. Cattle are shipped from here to Cuba and bring a good price. The fisheries here are entirely neglected though there is probably no point on the coast where such facilities could be obtained as here, for several months the river and bay is literally alive with schools of mullet which could be taken by the hundred barrel and when properly cured find a ready market.

On the Eastern part of his contract Deputy Apthorp found several Indian families living in small palmetto shanties, they had small patches of cultivation in corn, beans, pumpkins &c. though they seemed to subsist mostly on game

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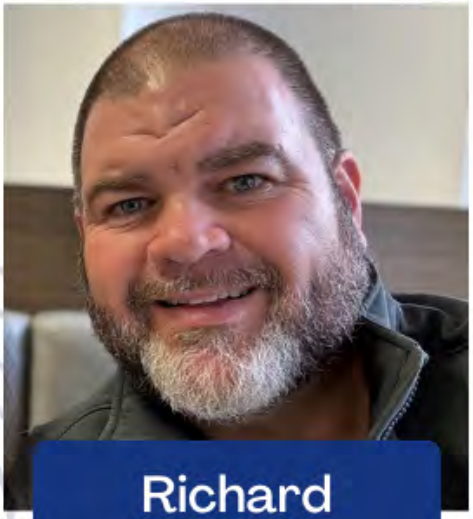

Richard Allen
PSM, CFM

Frank J. Conkling
PSM, GISP

Richard Pryce
RLS, PSM

Panelists:
Matthew Kalus, PSM, PE, Chief Engineer, Development Review Services, Orange County.
Dr. Bon Dewitt, PSM, PhD, Retired Professor Geomatics at UF.
Allen Nobles, PSM, VP. SAM, LLC & Former Owner: Nobles Consulting.
Greg Caffee, CCF, Mapper Sr./Cadastral, Orange County Property Appraiser.
Howard Ehmke, PSM, GCY, INC.
Mike Garcia, PSM, Program Manager II, Seminole County.

and fish. Deer and other game was found in abundance and the ponds and creeks were full of fish. The Indians dress their deer skins and sell them at Forts Thompson or Myers for whiskey, tobacco and such articles of clothing as they need. There were but few of them, not more than fifteen or twenty men, women and children. They were peaceably disposed and a party of four or five of them spent several days with the deputy in his camp. They still speak their native tongue though they can understand some English. They carried an interpreter with them whom they called the Doctor and who seemed to be principal man among them. There are several small parties west of the Everglades, some near the mouth of the Kissimmee River and still others who live in and East of the Everglades. They do not seem to have any recognized chief over them though in each community one of their number is looked up to as the head of the party. There are probably not more than two or three hundred of them living in the State, and they occupy lands that would be untenable for white men, so it is fair to be supposed they will not be disturbed for years to come. Their wants are few and easily supplied. They have no difficulty in getting plenty to eat, they can erect a shelter that is all they would have it in two hours, and as for clothing in this warm climate, the less the better. They were filthy and looked healthy and must certainly be happy.

The lands surveyed by Deputy Williams at the South end of Lake Worth are of little value unless drained. On the Lake are several bodies of good hammock, not large enough however to attract settlers to that point.

The Keys surveyed by Deputy Williams have on them considerable rocky hammock very productive and seemingly very desirably located for raising fruits. The growing of pine apples on Key Largo is now an established success. Mr. Baker who cultivates them largely on this Key makes it a success financially, and the fruit is as fine as can be raised in the West Indies and more easily got to market. The timber growing on these keys is entirely different from any found in any other part of the State being principally Crab Wood, Poison Wood, Mastic, Maderia wood, Wahoo, Plum and Gumbo Limbo.

The reefs outside protect the keys from the heavy storms, and the hammock is generally high enough to be cultivated without fear of Overflow.

Under the appropriation for continuing the surveys for the present fiscal

year, the remainder of the Keys from Key Largo to Key West will be surveyed and the subdivision of the country South of the Caloosahatchee River will be pushed forward to the full extent of the appropriation.

Accompanying this report are the following documents
"A" Map of the State showing the progress of surveys.
"B" Report of surveying operations in this district during the fiscal year.
"C" Statement of the present condition of contracts not closed at date of last annual report.
"D" Report of plats furnished the District Land Office.
"E" Report of deposits for special surveys.
"F" Estimate of Appropriations required for the Office of the Surveyor General and for continuing the Public Surveys within the district for the fiscal year ending June 30th 1874.

All of which is respectfully submitted
Very Respectfully
Your obt. Servt.
M. L. Stearns
Surveyor General

Next Month …

CHAPTER 10

BENJAMIN CLEMENTS

Joe Knetsch has published over 170 articles and given over 130 papers on the history of Florida. He is the author of *Florida's Seminole Wars: 1817-1858* and he has edited two additional books. *Faces on the Frontier: Florida Surveyors and Developers in 19th Century Florida* is a history of the evolution of surveying public lands in Florida and traces the problems associated with any new frontier through the personalities of the majort historical figures of the period. As the historian for the Division of State Lands, Florida Department of Environmental Protection, he is often called to give expert witness testimony involving land titles and navigable waterways issues.

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Moderator: Richard P. Green, Esq.
Florida Bar CLEs: Course Reference # 2403461N

RICHARD P. GREEN, ESQ.

PANELISTS:

Andrew J. Baumann, Esq.

James C. Weed, PLS

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Richard Malloy, PSM

Scott Woolam, PSM

A Boundary Dispute Case Mock Trial - Based in part on the case of Dowdell v. Cotham

6 CECs – Course #10808
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1565 – SPANIARDS

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its historic past;
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...buried treasure ...national parks
...national forests ...state parks

Hammerhead Shark

FIVE FLAGS OV

Spanish Treasure Frigate Attacked By Pirates

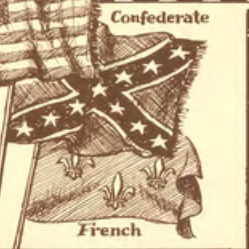
TILL 1821 PIRATES HAUNT COAST

1821 FLORIDA CEDED TO UNITED STATES

DRIVE OUT FRENCH

1565-1763 — SPAIN HOLDS FLORIDA (ST. AUGUSTINE)

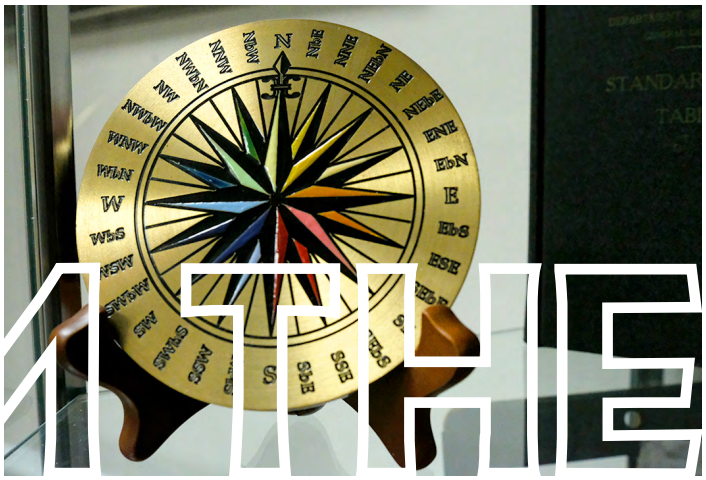
1783-SPAIN REGAINS FLORIDA FROM BRITIAN



1835-1842 SEMINOLES WAR ON UNITED STATES

1861-1865 FLORIDA FIGHTS FOR CONFEDERACY

Dave Mink, 1952



FROM THE ARCHIVES

SCENES

IN A

SURVEYOR'S LIFE;

OR A

RECORD OF HARDSHIPS AND DANGERS ENCOUNTERED.
AND AMUSING SCENES WHICH OCCURRED,

IN THE

Operations of a Party of Surveyors

IN

SOUTH FLORIDA.

By W. L. PERRY.

JACKSONVILLE:
C. DREW'S BOOK AND JOB PRINTING OFFICE 1859.

CHAPTER X

FROM about the time of the transpiration of events recorded in my last number, we began to experience tough times in the swamp, and our troubles were not materially abated, as our faithful history will show, until the last line was run, the chain rolled up, and our faces turned homeward. In fact, we were not without misfortune until we were safely landed at our respective homes.

At the time above referred to, which was about the middle of April, there commenced a dry spell of weather, which, judging from its effects, was without a precedent—at least for a number of years. Ponds, creeks, branches, swamps, and every other place usually containing water, dried up, and the face of the whole country was left without that element so necessary for the sustenance of animal and vegeable life.

I speak not exaggeratingly, when I say we must have seen, during that dry spell of weather, at least five thousand barrels of dead fish scattered over the beds of the dry ponds. These consisted of all sorts and sizes—from the largest trout, cat, and mudfish, down to the frisky little minnow.

During the whole month we were scarcely ever, at any time, out of reach of the almost intolerable smell emitted by the piles of these dead animals; and if the reader has any knowledge of the scent of putrid fish, he knows it is neither *salts nor cologne*. How I longed for Billy O'Neil's "nose that wouldn't smell!"

I have said we were left in the midst of a vast plain or swamp and prairie without water, which is true; but, as the reader may be inclined to

doubt this part of the story—that we lived for months without water—I proceed to explain.

We had a substitute, of course, of the efficacy of which I shall leave the reader to judge for himself.

When the water dried up, a soft, thick mud was left in the lowest spots; and our manner of procuring water was to repair to these moist places, with a pointed pole some three or four inches in diameter, scrape away the dead and putrid fish, jog down the pole, and after waiting a sufficient time for the water to ooze into the hole, sucked it up through reeds carried for the purpose. Invariably the color of the liquid was precisely that of "Harrison's best black ink;" and Rogers even suggested the idea of putting up a few barrels of it to speculate upon when we should return home; but owing to the difficulty of transportation to a market, the enterprise was abandoned.

It is useless to undertake a description of the appearance of the victuals cooked with this water—such as rice, bread, &c. It is enough to say, that they looked very much like they had been taken to a coal-pit and worked for an hour in coal dust, before being subjected to the process of cooking.

Up to this time we had been operating in the upper, or northern portion of our survey, and knew nothing of the topography of the country in the southern part. The Captain, therefore, during this dry season, determined to run his township lines in that direction, and thereby ascertain something of the nature of the country to which our future operations were to be confined. He accordingly ordered the cook to prepare six days rations, which was done. On Monday morning, bright and early, each man rolled in his own blanket his six days supply, and, as it was uncertain what sort of difficulties we might have to encounter, an additional provision of two days supply, uncooked, for the whole company, was put up and placed on Joe's back, who was required to do nothing but act in the capacity of pack-horse. He also carried the rifle.

For several miles we progressed finely, as we had only high and dry prairie to pass over, but at the end of this distance we entered a swamp— without much regret, however, as we knew there was no water to wade, and supposed it to be only a short distance through. In the

latter we were slightly mistaken.

The axemen were brought into requisition, and we went forward as fast as they were able to clear a path through the bamboo and tie-tie undergrowth.

Scarcely had we entered the swamp, when the everlasting stench of the dead fish burst upon us with almost stifling effect. Sometimes we passed small spots, lower than the surrounding ground, on which the water had stood longer than on other places, where lay putrid masses of fish to the depth of six inches or more. In passing these places each man held tightly his nose, and only released it at long intervals, and then but just a sufficient time to breathe enough of the infected air to enable him to keep his legs and march slowly on.

Dinner hour came, and instead of signs of an approach to better country, the swamp became more and more dense and difficult to pass, and discouragement began to be visible on every countenance. No one feeling disposed to eat, with the almost insuffereable stench arising from every quarter, and constantly present to the organs of smell, we "propelled" without stopping to dine.

Night came and found us still in the swamp, and, to all appearances, as far from the opposite side as ever.

Tired and weak from the effects of the excessive labor of the day, and the debilitating influence of the infected air breathed, we forced on our stomachs a respectable amount of supper, and retired, each man to his tussuck, or projecting cypress root, upon which to spend the night. We were forced to the tussucks and roots for rest, because the ground proper consisted of soft black mud, from ankle to knee deep, and was rather moist and "sloshy" to spread blankets and sleep upon. With the appearance of the first ray of light from the east on the following morning, we started again, in good spirits, with the hope that we should soon have the pleasure of seeing open country, far from mud and stench, but another day and night, and another, passed, and we were still in the swamp, the same as the first, except that we had become somewhat more accustomed to the odor emitted from the dead fish, and could devour our provisions with about as good relish as ever.

About an hour after dark, on the fifth night of our sojourn in the

swamp, after having eaten supper and taken our usual places on the tussucks and roots to pass the night, our astonished ears were greeted with a noise which appeared to me, at the time, could be compared to nothing short of the shaking to pieces of a hundred cities, by an earthquake, or the crash of steel, booming of cannon, shouts of victory, and screams of the wounded and helpless in battle.

"What's that?" exclaimed Sile, as the almost deafening racket burst upon us, at the same time springing from his roost on an elevated cypress root, and taking up knee deep in the mud below.

"What's that?" shouted Joe, as he followed suit, except that he landed stomach and face first in the mud. "What's that?" he continued, as he endeavoured to draw himself out of the mud. "Has the devil open'd his gates, and turned loose his prisoners to destroy the world?"

Every man mounted up on the highest place he could conveniently climb, to catch, if possible, some distinct sound that would lead to a knowledge of the cause of this bedlamic fuss in the swamps.

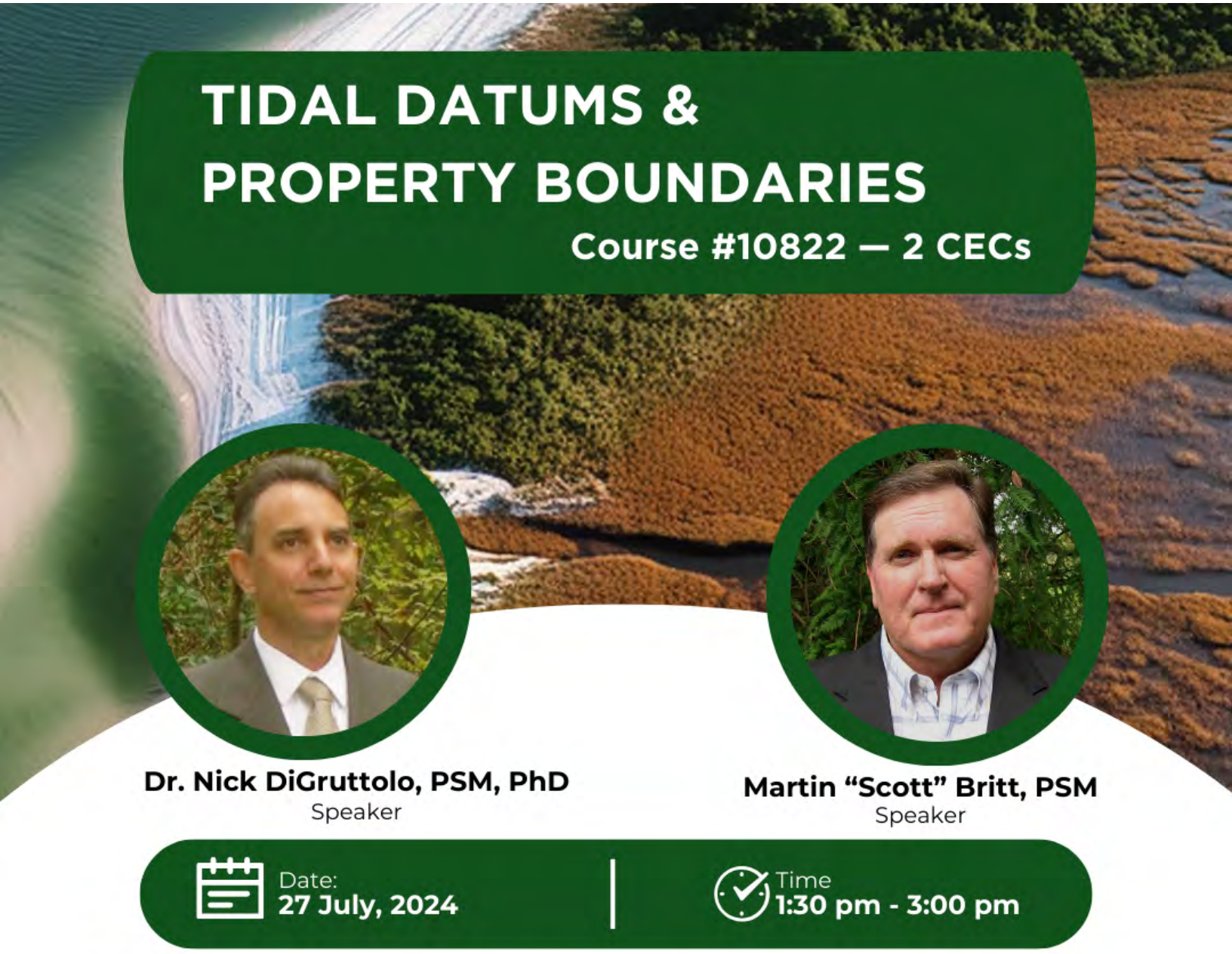
For a long time we listened in astonishment without being able to do so. At last, however, the noise grew somewhat less, and we were able to distinguish the sounds.

The Captain was the first to come to a clear comprehension of the matter. He said that there was a hole of water about the spot from whence the noise proceeded, and all the birds, beasts, and reptiles, of the whole country around, had collected there to quench their thirst; which was the fact. Through the whole night the noise was kept up to such an extent that we slept but little.

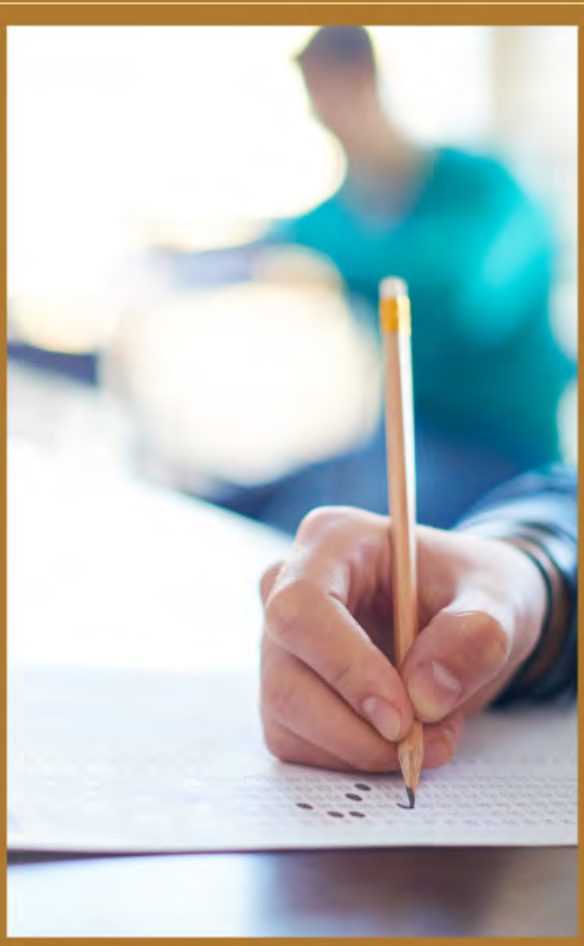
Owls hooted, ducks quacked, cranes whooped, water-turkeys squalled, foxes barked, wolves howled, panthers screamed, bears growled, and alligators bellowed, all of which noises, commingling together, made "one grand fuss" frightful to listen to. On repairing to the spot next morning, we found the Captain's surmise to be true. There was a deep dark hole of water, embracing I suppose about an acre, and around it was collected every conceivable variety of birds and smaller animals, (the larger had retired to their dens,) inhabiting the wild woods of South Florida. Of the birds there was no such thing as estimating their number. Of the alligators, it is sufficient to say that we

counted three hundred and seventy in this small body of water, and they were all large, as the small ones had all been eaten up by the larger.

I shall have somewhat more to say of this place, and our tramp of six days, in my next.•



CST Exam at Annual Conference



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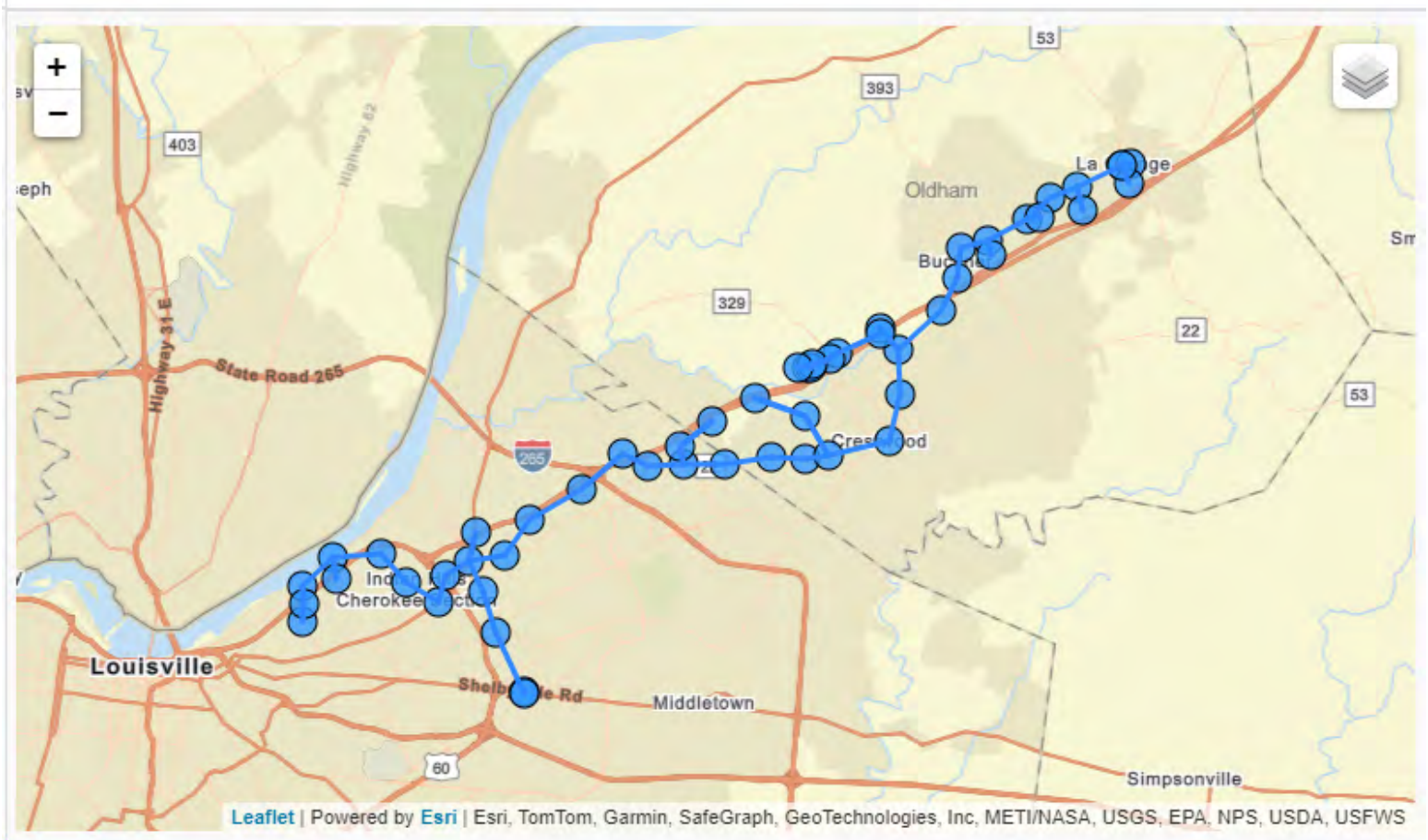
NGS News

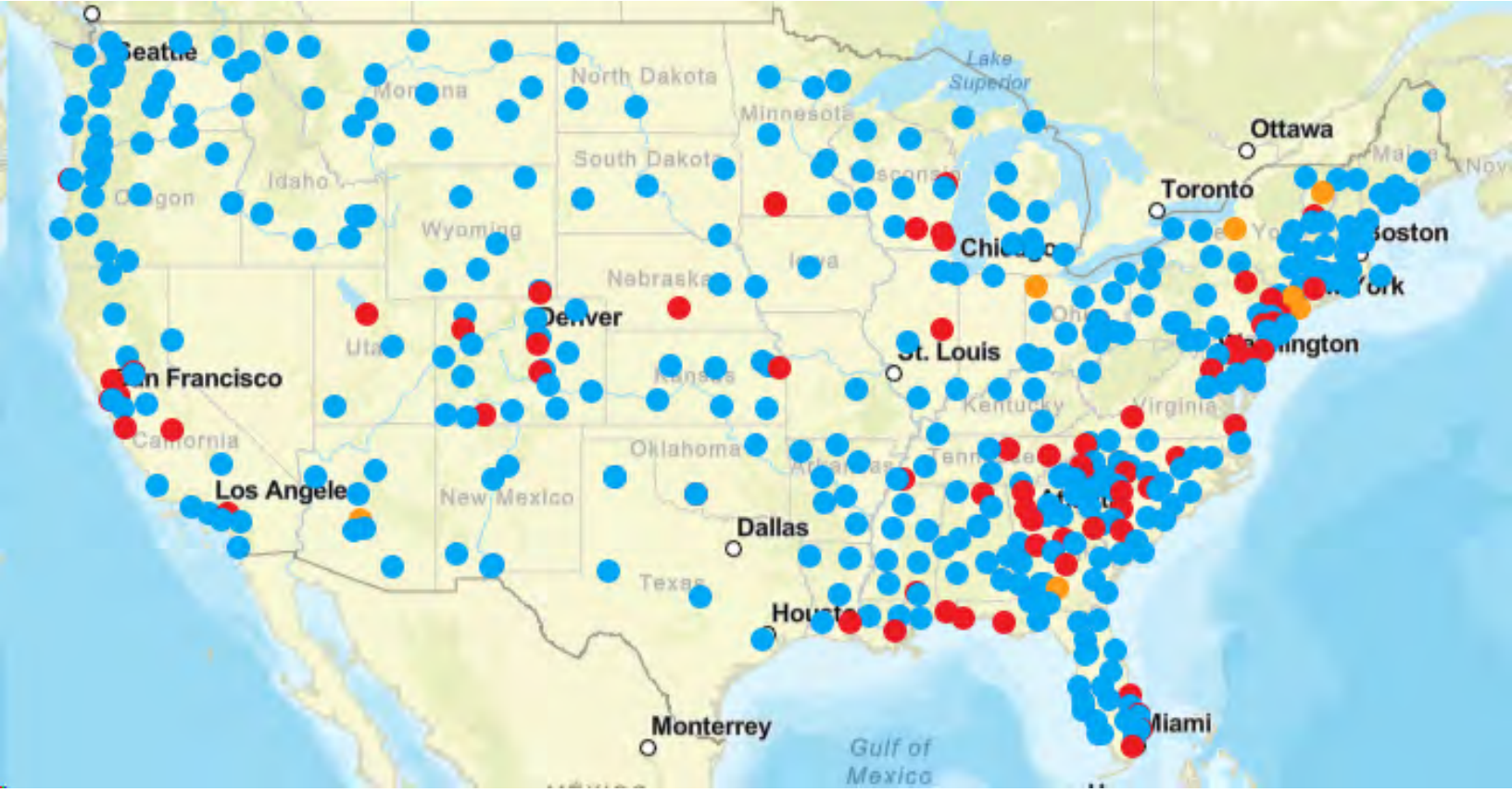
Four new online tools are now available for the public, providing easier access to NGS data

After extensive testing though our Beta site, NGS is making the following four online tools available to the public as official products offered on the geodesy.noaa.gov website:

- DSWorld Web - enables users to submit updated information on survey marks available on NGS datasheets.
- Leveling Project Page - simplifies searches for mark and observation information for an entire leveling project.
- Calibration Baselines (CBL) Web Map - provides quick and easy access to the latest CBL information.
- Passive Marks Page - for user-friendly datasheet access, including graphics, maps, and project information.



Example of Leveling Project Page, showing project L18355, a Louisville to LaGrange KY survey from 1960.



Calibration Baselines (CBL) Web Map showing available GOOD (Blue) SUSPECT (Yellow) or DISTURBED (Red) calibration stations.

FLORIDA SURVEYING AND MAPPING LAWS

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Past Presidents

1956 - 1957
H.O. Peters

1957 - 1958
Harry C. Schwebke

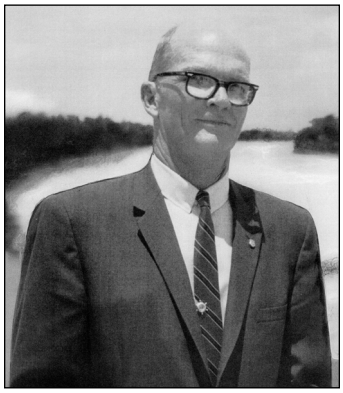
1958 - 1959
John P. Goggin

1959 - 1960
R.H. Jones

1960 - 1961
Hugh A. Binyon

1961 - 1962
Russell H. DeGrove

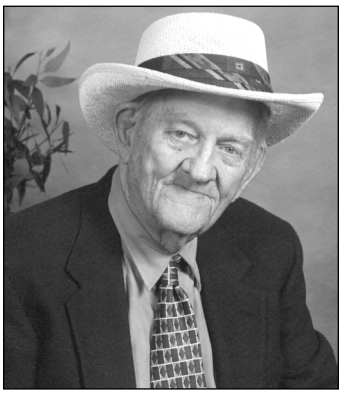
1962 - 1963
Perry C. McGriff



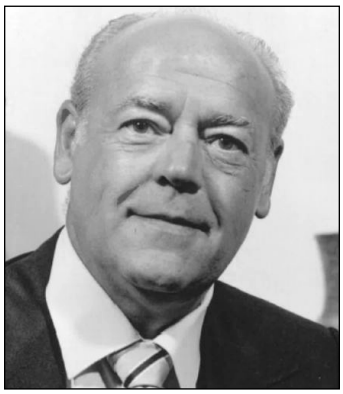
1963 - 1964
Carl E. Johnson

1964 - 1965
James A. Thigpenn, III

1965 - 1966
Harold A. Schuler, Jr.



1966 - 1967
Shields E. Clark



1967 - 1968
Maurice E. Berry

Past Presidents

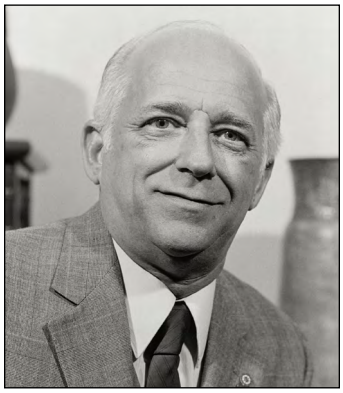
1968 - 1969
William C. Hart

1969 - 1970
Frank R. Shilling, Jr.

1970 - 1971
William V. Keith

1971 - 1972
James M. King

1972 - 1973
Broward P. Davis

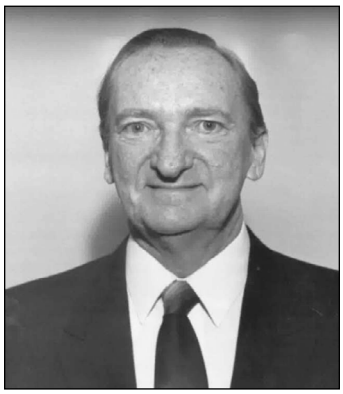


1973 - 1974
E.R. (Ed) Brownell

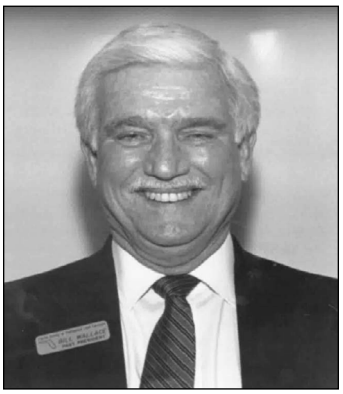
1974 - 1975
E.W. (Gene) Stoner

1975 -1976
Lewis H. Kent

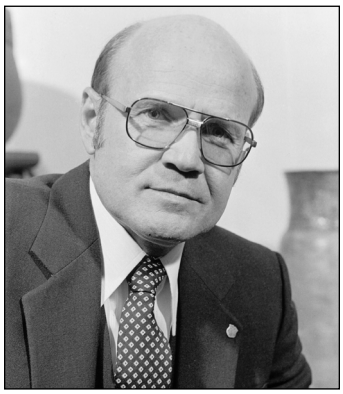
1976 - 1977
Robert S. Harris



1977 - 1978
Paul T. O'Hargan

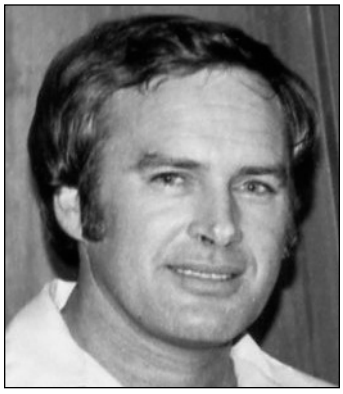


1978 - 1979
William G. Wallace, Jr.



1979 -1980
Robert W. Wigglesworth

Past Presidents



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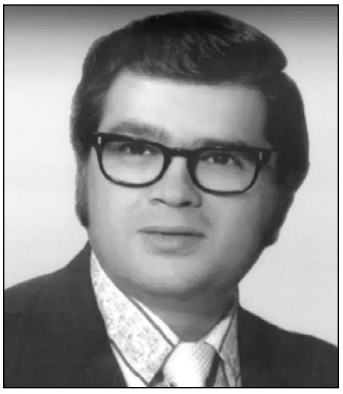
Ben P. Blackburn

1981 - 1982
William B. Thompson, III



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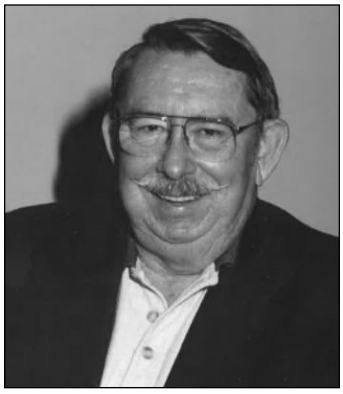
John R. Gargis



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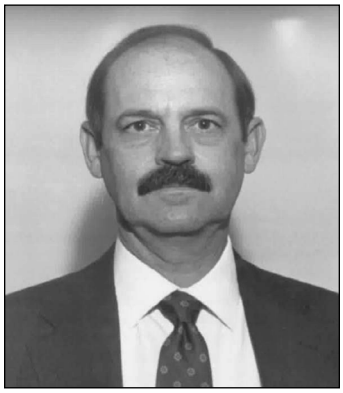
Robert A. Bannerman



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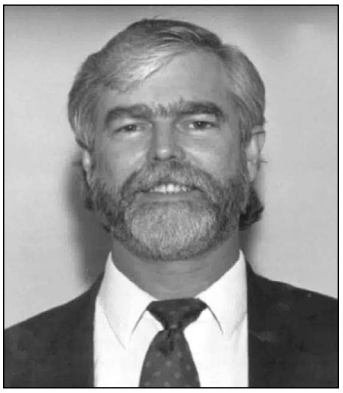
Buell H. Harper

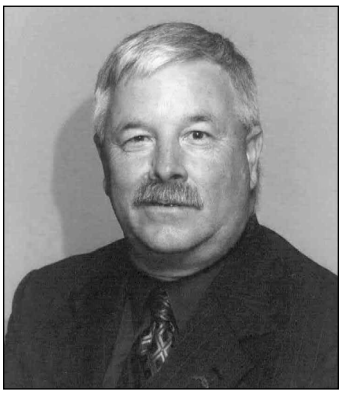
1985 - 1986
H. Bruce Durden



1986 - 1987
Jan L. Skipper

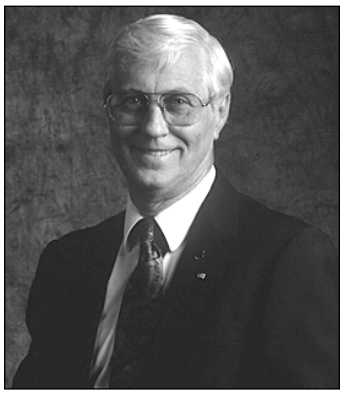
1987 - 1988
Stephen M. Woods

1988 - 1989
Stephen G. Vrabel



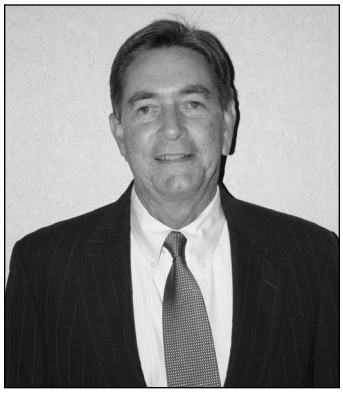
1989 - 1990
W. Lamar Evers

1990 - 1991
Joseph S. Boggs



1991 - 1992
Robert L. Graham

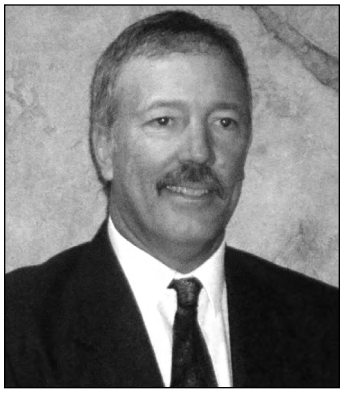
Past Presidents



1992 - 1993
Nicholas D. Miller

1993 - 1994
Loren E. Mercer

1994 - 1995
Kent Green



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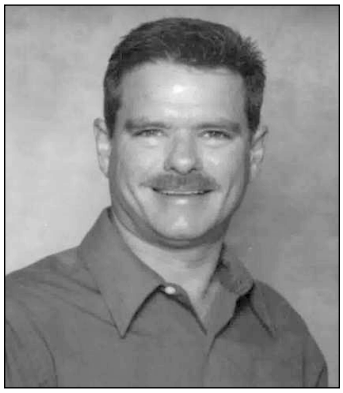
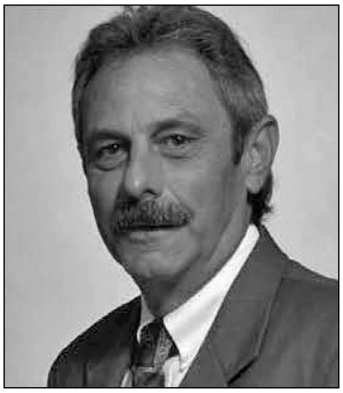
Robert D. Cross



1995 - 1996
Thomas L. Connor

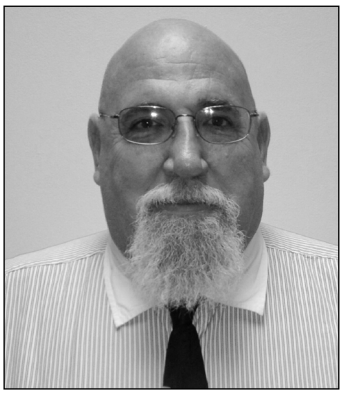
1996 - 1997
Gordon R. Niles, Jr.

1997 - 1998
Dennis E. Blankenship



1998 - 1999
W. Lanier Mathews, II

1999 - 2000
Jack Breed



2000 - 2001
Arthur A. Mastronicola

2001 - 2002
Michael H. Maxwell

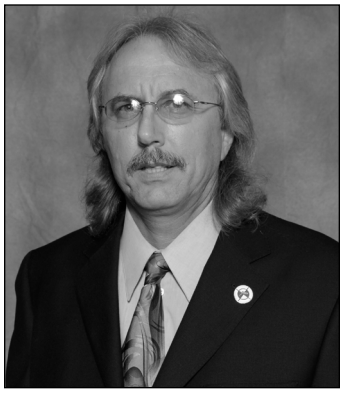
2002 - 2003
John M. Clyatt

Past Presidents

2003 - 2004
David W. Schryver

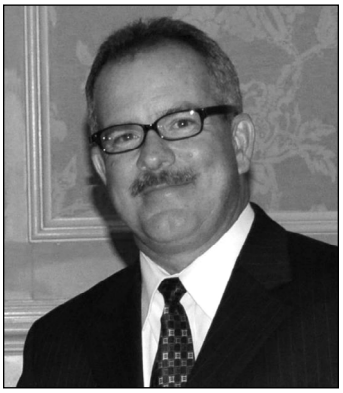
2004 - 2005
Stephen M. Gordon

2005 - 2006
Richard G. Powell

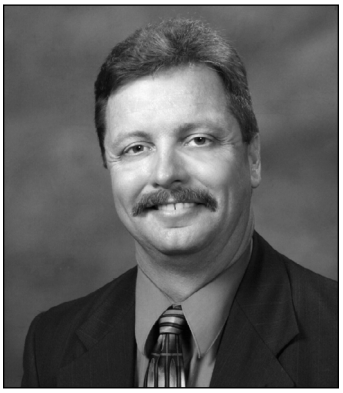


2006 - 2007
Michael J. Whitling

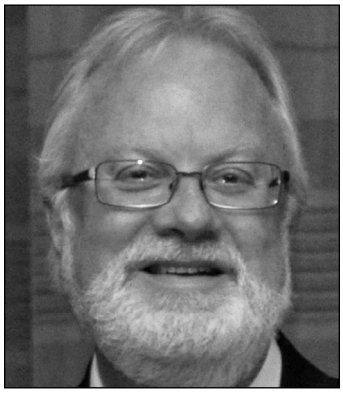
2007 - 2008
Robert W. Jackson, Jr.



2008 - 2009
Pablo Ferrari



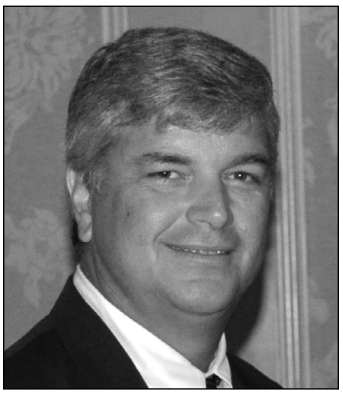
2009 - 2010
Steve Stinson



2010 - 2011
Dan Ferrans

2011 - 2012
Jeremiah Slaymaker

2012 - 2013
Ken Glass

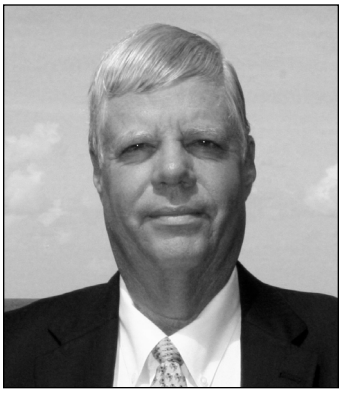


2013 - 2014
Russell Hyatt

2014 - 2015
William Rowe

Past Presidents

2015 - 2016
Dale Bradshaw



2016 - 2017
Lou Campanile, Jr.

2017 - 2018
Robert Strayer, Jr.

2018 - 2019
Dianne Collins

2019 - 2020
Don Elder

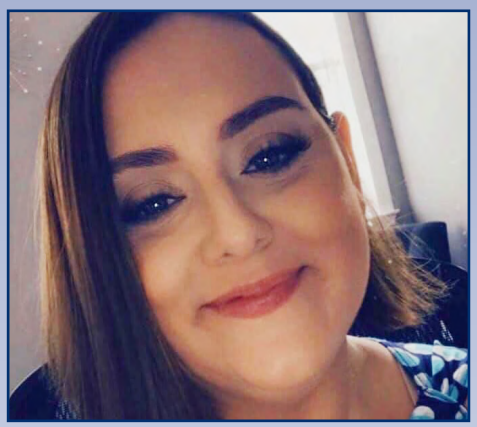
2020 - 2021
Hal Peters

2021 - 2022
Lou Campanile, Jr.

ADMINISTRATIVE Staff

Executive Director

Rebecca Porter
director@fsms.org



Education Director

Samantha Hobbs
education@fsms.org

Communications Director

Justin Ortiz
communications@fsms.org

Regional Coordinator

Cathy Campanile
seminolecc84@gmail.com

GOLF TOURNAMENT

8 AM WEDNESDAY 7/24/2024

Players arrive 45 minutes prior to play.
Carts will head out onto the course 10 minutes prior to scheduled start time.

REGISTRATION

$100/PERSON
~
$200/TEAM

- Cash Prize for 1st, 2nd, & 3rd Place Teams
- Cash Prizes for Closest to Pin on all Par 3's
- $20 Lunch Voucher & Range Balls included
- Limited to 24 players (12 teams of 2)

Sponsored By:

CENTRAL FLORIDA CHAPTER

FLORIDA SURVEYING AND MAPPING SOCIETY
FOUNDED 1985

CONTACT JAMES MAZURAK FOR QUESTIONS REGARDING THIS EVENT
JMAZURAK@SSMC.US
(321)403.4123

Shingle Creek GOLF CLUB
9939 UNIVERSAL BLVD.
407-996-9933
WWW.SHINGLECREEKGOLF.COM

The Historical Cartography of Florida Course #10809 - 3 CECs Dr. Joe Knetsch, PhD

This course is designed to facilitate the understanding of the early and current mapping of the State of Florida. Each age has had its differing purposes and various nations have contributed to the mapping of the land of Florida. From the earliest explorers to the current GIS systems, the maps of Florida have shown the changes in the land, the formations exposed or covered and the property lines of all individuals who claim to own the land. Each type of map, coast charts, property plats, etc. have their individual purposes and all need to understand that each map will show or highlight something different depending upon the use for which it is intended. This course will demonstrate that each map has its use and interpretation and it is important to understand these before committing a proper survey of the lands to be depicted.