

Comprehensive Key Projects

Hillsborough County, Tampa Bay Estuary Program

Best Management Action Plan Support

Elsinore Valley Municipal Water District

Elsinore Basin Water Management Plan Aquifer Yield and Groundwater Basin Recharge Numerical Modeling: Elsinore, CA

Elsinore Valley Municipal Water District, Coldwater Basin

Coldwater Basin Recharge Feasibility Study: Elsinore, CA

SWFWMD

Analysis of Hydrologic Data to Support Minimum Flows for Rivers: West-Central Florida

SJRWMD

Minimum Flows and Levels: Water Resource and Human-use Values Assessment: Brevard and Orange Counties, FL

SRWMD

Technical Peer Review for MFLs: Madison Blue Springs

Hillsborough County

Spring Flow Limitations on a Water Use Permit Issue: Hillsborough County, FL

Hillsborough County

Development of Hydrobiological Monitoring Programs for Tampa Bay and Major Rivers in the Area

Town of Belleair

Reclaimed Water Feasibility Study

Tampa Electric Co. (TECO)

Comprehensive Environmental Study, Including Integrated Surface Water/Process Water Modeling

Arizona National Guard, 162nd Fighter Wing

Groundwater Flow and Contaminant Transport Modeling Tucson, AZ

AFCEE, Wurtsmith Air Force Base

Groundwater Flow and Contaminant Transport Modeling Oscoda, MI

SJRWMD

Minimum Flows and Levels (MFLs) at Lake Poinsett

SWFWMD

Proposed Minimum Flows and Levels for the Lower Peace River Creek: City of Punta Gorda, FL

SWFWMD

Homosassa River Salinity and Thermal Model Development, FL

SWFWMD

Power & Industrial Plant Water Use & Water Conservation Assistance: Brooksville, FL

SWFWMD

Water Supply / Conservation Measures for Agricultural Water

SWFWMD

Economic Feasibility of Reclaimed Water Use by Non-Utility Applicants



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LOCATIONS

HSW Engineering, Inc.

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- Gainesville, FL

www.hsweng.com

Who is HSW?

Incorporated in the State of Florida, with offices located in Tampa, Orlando, DeLand, Sarasota, and Gainesville, Florida, HSW was founded in 1988 by three professionals with over 80 years of combined experience in environmental engineering services. Staff members have backgrounds in engineering (chemical, civil, environmental, electrical, mechanical, and mining), geology, hydrogeology, soil physics, hydrology, computer modeling, chemistry, and toxicology.

HSW has built a reputation for development of innovative and streamlined approaches to traditional methods of project performance, administration, and reporting, resulting in the cost-effective implementation of project tasks. We identify windows of opportunity for creative approaches to streamlining processes and reducing costs. Particularly in the areas of environmental permitting and reporting, HSW exhibits creativity not often found in environmental firms of any size.



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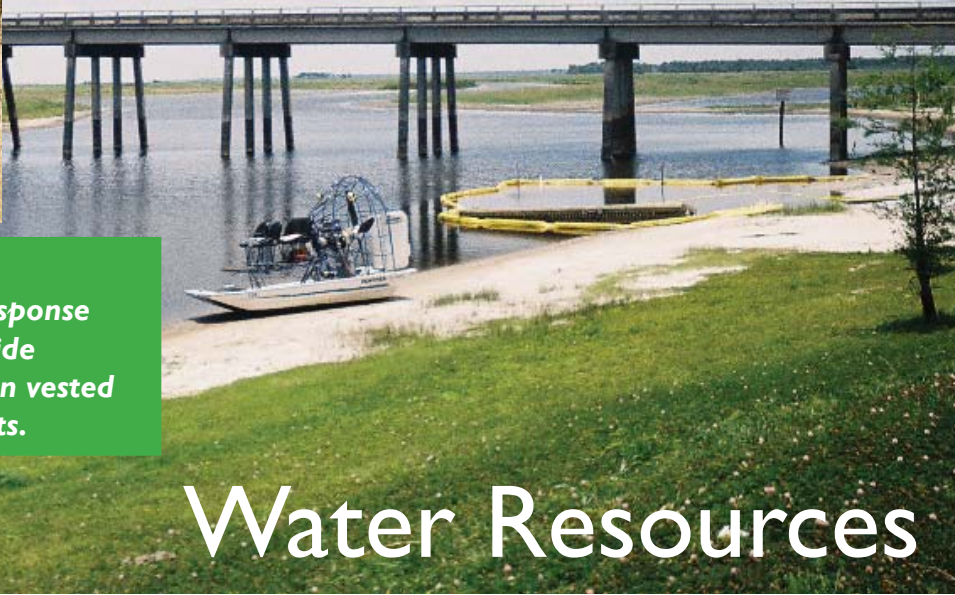


WATER RESOURCES





It is our belief that the greatest innovations come from rapid response from small businesses that provide dedication, expertise, and a keen vested interest in the success of projects.



Water Resources

Background

HSW continues to expand an already extensive experience in the planning, management, and development of water supply/needs resources, water treatment, ecological restoration, and water conservation programs. Our specialized group of experts provides high level, comprehensive, and innovative services to meet our clients' water resources needs in a timely fashion for reasonable fees.

PLANNING & MANAGEMENT

- Regional Planning of Water Supply Needs/Sources
- Consumptive/Water Use Permitting
- Environmental Resource and Wetland Mitigation Bank Permitting
- Economic Assessments and Financial Planning
- Stormwater Management
- TMDL Implementation
- Watershed Master Plan Development

DEVELOPMENT

- Groundwater Resource Exploration and Evaluation
- Surface and Ground Water Modeling
- Wellfield Design and Development
- Safe Yield Determination
- Wellhead Protection

TREATMENT, RESTORATION & CONSERVATION

- Water Reuse Planning, Development, and Implementation
- Water Conservation Programs
- Wetland Preservation and Mitigation
- Minimum Flows and Levels (MFLs)
- Groundwater and Surface Water Restoration
- Water Quality and Estuary Flushing Modeling

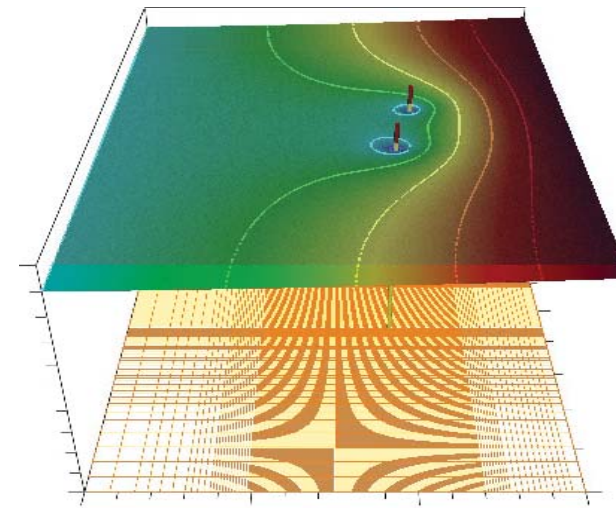
Stormwater Management & TMDL Implementation

HSW has experience with green infrastructure and innovative water resources projects, including aquifer test designs, watershed evaluation, floodplain analysis, stormwater system design, low impact development (LID) techniques, and hydrologic data processing. Specifically, team members have extensive experience in designing and implementing innovative stormwater best management practices (BMPs) in support of community water quality goals. HSW's experience includes working with communities to establish total maximum daily loads (TMDLs) for a watershed as required by Section 303(d) of the Clean Water Act. Finally, HSW can assist with Stormwater NPDES (National Pollution Discharge Elimination System) permitting and work with communities to implement conservation design practices as a "smart growth" stormwater BMPs.

Hydrology & Hydraulics Modeling

The HSW Integrated Hydrology and Hydraulics Modeling (IH²M) Group is comprised of HSW Engineers and Scientists specializing in high-level numerical modeling to obtain solutions to hydrology and hydraulics water quantity and quality problems. Modeling is closely coordinated with other project aspects to ensure that simulations are relevant and indicative of reality. Highlights of our modeling capabilities include:

- 3-D Groundwater Flow and Solute Transport (Including Density Dependent Flow)
- Watershed Modeling, Flood Area Delineation, and Non-point Source Pollution Migration
- Water Distribution System Design and Optimization
- Storm Water Conveyance and System Design
- Riverine and Open Channel Flow, including Nutrient and Sediment Transport
- Estuarine Systems
- Environmental Remediation, Evaluation, Design & Optimization
- Environmental Forensics
- Safe Aquifer Yield Determination



The HSW IH²M Group is lead by Ken Watson, Ph.D. (Hydrology), Donald Carpenter, Ph.D. (Open Channel and Stormwater), and Chad Drummond, P.E. (Groundwater). They and other group members use a variety of models in the analysis of hydrologic and chemical data to assist with resource evaluation and system design and optimization. Our modeling experts understand the physics behind groundwater and surface water phenomena and have used this understanding to program customized computer code, as necessary. Appreciation of complications arising from groundwater/surface water interactions, an important interaction in most areas of Florida, also follows from this understanding of first order principles.

The HSW IH²M Group uses the latest private and public domain numerical and analytical models. Hydrogeologic and solute transport models employed include WinFlow, WinTran, Bioscreen, MODFLOW, MT3DMS, BIOPLUME, BIOCHLOR, RT3D, and MIKE SHE. WinPEST is routinely used to assist with model calibration. Hydrologic and hydraulic codes utilized include HEC-HMS, HEC-RAS, SWMM, WASP, BASINS, ICPR, EFDC, etc.

Minimum Flows and Levels

Our water resources personnel are active in the determination, evaluation, and peer review of Minimum Flows and Levels (MFLs). We have completed MFL projects for SWFWMD, SJRWMD, and SRWMD. "Minimum Flow" is the limit in a watercourse at which further withdrawals would be significantly harmful to the water resource or ecology of the area,



and "Minimum Level" is the level of groundwater in an aquifer and/or the level of surface water (e.g., lake) at which further withdrawals would be significantly harmful to the water resources of an area. Minimum groundwater levels are established to protect surface features, such as wetlands and lakes, from excessive groundwater withdrawals and to protect aquifers from regional saltwater.

Wellfield Design & Development

The HSW Team has experience in the development and evaluation of wellfields, including consumptive use/water use permit compliance and renewal for a total of 11 major wellfield systems (approximately 100 production wells with approximately 150 mgd permitted quantities). Our staff has implemented innovative, state-of-the-art ecologic, hydrologic and water-quality monitoring and analytical programs (with budgets exceeding \$3 million/year) for each wellfield/source of supply designed to comply with permit rules and identify potential impacts from groundwater production. Our personnel have also developed mitigation methodologies, including well rotation and augmentation programs.

Environmental Monitoring

HSW scientists and engineers understand and appreciate that the accuracy and reliability of H&H modeling and other water-resource investigation is as good as the fundamental data used in the analysis. The collection of technically defensible data is not an insignificant task. Our understanding and experience with collecting a wide variety of environmental data broadens our skill set and strengthens our ability to evaluate historic data collected by others. Several examples of environmental monitoring our professionals have demonstrated experience in providing follow:

- Continuous recording stream gaging and wetland water-level monitoring in support of environmental resource and mitigation bank permitting
- Automated flow- and time-weighted composite water-quality sampling in support of pesticide re-registration and alternative stormwater management system design
- Aquifer performance testing in support of water use permitting and ground-water remediation
- Dye fluorometry measurements of pump and culvert discharge and stream travel time
- Measurement and analysis of a variety of wetland hydroperiod indicators in addition to water level
- Measurement of field conditions in estuaries, harbors, and streams including water level, velocity, and water quality parameters for the calibration of computer models
- Measurement of water quality and discharge from innovative structural stormwater BMPs to evaluate BMP performance.