

## User's Guide

Welcome to the Location File for St. Johns River, Florida! At 310 miles [499 kilometers] long, the St. Johns River is the longest river in Florida, and the longest river in the United States that flows *northward*. The St. Johns is also one of the "laziest" rivers in the world because its total drop, from its source in marshes south of Melbourne to its mouth in the Atlantic near Jacksonville, is less than 30 feet [9.1 meters]! This slow flow makes it difficult for the river current to flush pollutants.

The Lower St. Johns River (LSJR) extends from where the Ocklawaha River joins the St. Johns River to the sea, and includes slightly more than a third of the total length of the St. Johns River. This Location File does not simulate the entire LSJR, but does extend slightly beyond the dredged channels where vessels transit and beyond historical spill locations.



NOAA has created Location Files for different U.S. coastal regions to help you use the General NOAA Oil Modeling Environment, GNOME. In addition, on a case-by-case basis, NOAA develops international Location Files when working with specific partners. The St. Johns River Location File was completed as part of the NOAA Coastal Storms Initiative ([http://www.publicaffairs.noaa.gov/budget02/coastal\\_storms\\_factsheet.html](http://www.publicaffairs.noaa.gov/budget02/coastal_storms_factsheet.html)).

Each Location File contains information about local oceanographic conditions that GNOME uses to model oil spills in the area covered by that Location File.

Each Location File also contains references (both print publications and Internet sites) to help you learn more about the location you are simulating.

As you work with the Location File for the St. Johns River, GNOME will prompt you to:

1. Choose the model settings (start date and time, and run duration).
2. Input the wind conditions.

GNOME will guide you through choosing the model settings and entering the wind conditions. Each window has a button that leads you to helpful information and the general Help topic list. Click the Help button anytime you need help setting up the model. When you need to input the wind conditions in GNOME, you can click the “Finding Wind Data” button to see a list of web sites that publish wind data for this region.

More information about GNOME and Location Files is available at <http://response.restoration.noaa.gov/software/gnome/gnome.html> .

## **Technical Documentation**

### ***Background***

The St. Johns River circulation is controlled by the moderate tides. Although the St. Johns River is the longest river in Florida, it is only fifth largest in terms of discharge volume. Freshwater runoff does not significantly affect the circulation. The freshwater output makes up about 1/7<sup>th</sup> of the average tidal flow (Anderson and Goolsby 1973).

The two jetties at the entrance to the St. Johns River are built of rip-rap, which is permeable to spilled oil. We have simulated these jetties as solid structures in this Location File, for ease of implementation. If you have any trajectories that bring oil near the jetties, you should consider that oil could go through the jetties, in addition to the results of your trajectory.

Within this Location File, the extensive marsh areas are simulated as solid shoreline. Thus, GNOME will show that oil has beached on the shoreline and will not show any penetration into marsh regions. When running your scenarios, you should consider that any oil at the edge of a marsh could potentially move into the marsh.

### ***Current Patterns***

Two current patterns are used in this Location File: one for tides and one for the nearshore circulation outside of the St. Johns River entrance. Both of these currents were created using the NOAA Circulation Analysis for Trajectory Simulations (CATS) hydrodynamic model. The tidal circulation is keyed to the

main tide station at the St. Johns River entrance, which is located between the jetties.

In this region, the alongshore flow can reverse, but most commonly flows to the north. We have scaled the offshore circulation to be approximately 10 centimeters/second (cm/s).

## **References**

You can get more information about the St. Johns River area from these publications and web sites.

### **Oceanographic**

National Oceanic and Atmospheric Administration, National Ocean Service. 2001. Tidal Current Tables 2002: Atlantic Coast of North America. Camden, ME: International Marine. 219 pp.

U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), National Ocean Service (NOS). 2001. United States Coast Pilot 4, Atlantic Coast: Cape Henry to Key West, 33rd Edition. Washington, DC: NOS. 358 pp.

### **Hydrographic**

Anderson, W. and D.A. Goolsby. 1973. Flow and Chemical Characteristics of the St. Johns River at Jacksonville, Florida. Information Circular 82. Tallahassee, FL: U.S. Geological Survey.

Morris, F.W., IV. 1995. Volume 3 of the Lower St. Johns River Basin Reconnaissance: Hydrodynamics and Salinity of Surface Water. Technical Publication SJ95-9. Palatka, FL: St. Johns River Water Management District. 362 pp.

USGS Real-Time Data for Florida: Streamflow

<http://waterdata.usgs.gov/fl/nwis/current/?type=flow>

This U.S. Geological Survey (USGS) site provides discharge and gage height data for many St. Johns River stations.

St. Johns River Water Management District

<http://sjr.state.fl.us>

As one of five regional districts responsible for the protection and management of Florida's water resources, the St. Johns River Water Management District's responsibilities emphasize water quality, water supply, flood protection, and ecosystem management.

Florida Department of Environmental Protection

<http://www.dep.state.fl.us>

The Florida Department of Environmental Protection is the lead State agency for environmental management and stewardship. Its Division of Water Resource Management is responsible for protecting the quality of Florida's drinking water, as well as its rivers, lakes, wetlands, and beaches, and for reclaiming lands after they've been mined for minerals.

Metadata for St. John's River, Florida ESI

<http://www.researchplanning.com/metadata/sjmeta.htm>

Metadata for the St. Johns River Environmental Sensitivity Index (ESI) data set, prepared by Research Planning, Inc., Columbia, South Carolina.

## Wind and Weather

National Weather Service: Southern Region Headquarters

<http://www.srh.noaa.gov/data/forecasts/FLZ025.php>

Current conditions and forecast for Duval County, FL.

Interactive Weather Information Network (IWIN) (Text version)

<http://iwin.nws.noaa.gov/iwin/textversion/state/fl.html>

Click "Zone Forecast," then scroll to view the forecast for Duval county (FLZ025).

Interactive Weather Information Network (IWIN): Florida State Information

<http://iwin.nws.noaa.gov/iwin/fl/fl.html>

Click "Jacksonville" on the map to view current weather conditions at Jacksonville International Airport.

NOAA/NOS Center for Operational Oceanographic Products and Services (CO-OPS)

[http://co-ops.nos.noaa.gov/data\\_options.shtml?stn=8720218+Mayport+\(Bar+Pilots+Dock\),+FL](http://co-ops.nos.noaa.gov/data_options.shtml?stn=8720218+Mayport+(Bar+Pilots+Dock),+FL)

Retrieve environmental data recently collected at National Ocean Service data collection platforms and stored in the CO-OPS databases. Click the link "Weather/Ocean Data" to view the form you can use to retrieve data. Follow these steps to view current wind observations for 8720218 Mayport (Bar Pilots Dock), FL (30° 23.8' N, 81° 25.8' W).

- (1) Check that "8720218 Mayport (Bar Pilots Dock), FL" is shown in the Station box.
- (2) Choose "C1 - Wind Speed, Dir, Gusts" from the Sensor menu.
- (3) Enter beginning and ending dates for the data you'd like to view.
- (4) Select a date/time format from the Output Format menu, then select a Time Zone (UTC [coordinated universal time; formerly known as Greenwich Mean Time] or LST [Local Standard Time]).
- (5) Click the "View Data" button to see the data in tabular form, or click the "View Plot" button to see the data in graphical form. Wind speed is provided in meters per second (m/s) and wind direction in degrees true.

## **Oil Spill Response**

NOAA Hazardous Materials Response Division (HAZMAT)

<http://response.restoration.noaa.gov>

Tools and information for emergency responders and planners, and others concerned about the effects of oil and hazardous chemicals in our waters and along our coasts.