



# Collier Soil and Water Conservation District

Gazetteer

May 2013

## Hydrology:

We need to know

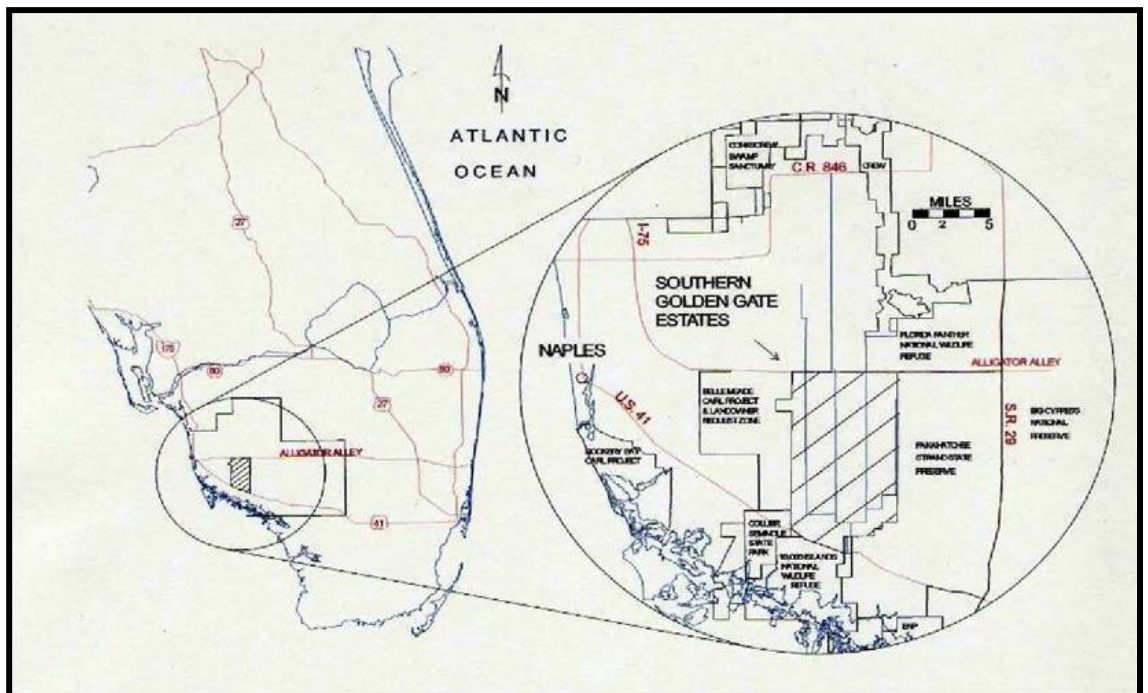
1. Duration of Uninterrupted Inundation. This performance measure is the mean duration (in terms of the number of five-day periods) of all inundation events during the 36-year period of record in the watershed.

2. Number of Dry Events. Dry events are defined as times when the water level drops either to or below the ground surface (0.00 ft). This performance measure is the number of dry events during the 36-year period of record in the watershed.

3. Hydroperiods. Hydroperiods are defined as the average number of five-day periods per year when the water level is above (>0.01 ft) the ground surface during the 36-year period of record in the watershed.

4. Duration of Water Level Deviation. The first would be a count of the number of five-day periods when the natural water table is at or below ground (<0.00 ft) and the scenario being evaluated is <0.5 ft higher or lower than the natural water level 36-year period of record in the watershed.

Big Cypress Basin is not in the Everglades! It's an isolated basin.



To prevent natural resource degradation, the Supervisors believe that it's time to consider the development of acceptable practices to manage our watershed.

The Watershed Management Plan (WMP) was developed to protect water resource quality and quantity by drainage area or watershed. The Board of County Commissioners (BCC) accepted the WMP at the December 13, 2011 meeting which identifies concerns that need to be addressed to protect water resources including:

- Excessive fresh water discharges from canals (including ground water discharges) especially to Naples Bay;
- Failure of drainage system to provide desired level of flood protection;
- Pollutant loading associated with development and degraded water quality conditions, and
- Aquifer impacts due to canal discharge, reduced recharge, and potable and agricultural withdrawal demands.

The BCC approved the WMP recommended Projects and Initiatives to mitigate for existing adverse impacts and to limit further adverse impacts by future development but they did so without modeling watershed impact! Additionally, the WMP fails to consider thresholds of watershed land use change and watershed development/urbanization which, if exceeded, will result in unacceptable hydrologic reaction or aquatic ecosystem degradation.

None of the WMP projects have been implemented to date and should not be until their benefit to the floodplain is modeled.

5. Seasonal Amplitude and Inter-annual Variability of Water Levels. This performance measure uses water depths above and below ground for five-day periods to calculate the average annual maximum and minimum water levels, the average range of annual fluctuation, and year-to-year variation in these values over the past 36-year period of record in the watershed.

6. Water Levels and Timing. This performance measure evaluates water levels relative to the ground surface and timing over the past 36-year period of record in the watershed.

It is important to be aware that the above performance measures are based on long-term averages and there is a great deal of natural year-to-year variability in these values.

In addition, the same types of plant communities vary substantially from one place to another, because of differences in their setting and site history.

Even though extreme environmental events can have major effects in shaping plant communities, they don't normally produce shifts from one community type to another because the overall ecosystem has evolved in the context of these events.

#### Contact Us:

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Watersheds are complex landscapes containing multiple potential sources of materials that can degrade water quality. Understanding linkages between land use, material export and water quality response is key to designing and implementing an effective watershed management plan.

Our need for fresh water has long caused us to overlook equally vital benefits of water that remains in stream to sustain healthy aquatic ecosystems. There is growing recognition, however, that functionally intact and biologically complex freshwater ecosystems provide many economically valuable commodities and services to residents of Big Cypress Basin.

These services include flood control, transportation, recreation, purification of human and industrial wastes, habitat for plants and animals and production of fish and other foods and marketable goods. Over the long term, intact ecosystems are more likely to retain the adaptive capacity to sustain production of these goods and services in the face of future environmental disruptions such as climate change.

These ecosystem benefits are costly and often impossible to replace when aquatic systems are degraded. For this reason, deliberations about the watershed should always include provisions for maintaining the integrity of freshwater ecosystems.

To make the WMP come to life, we recommend:

1. Framing water management policies to explicitly incorporate freshwater ecosystem needs.
2. Define the watershed, so that fresh waters are viewed within a landscape or ecosystem context instead of by political jurisdiction or in geographic isolation.
3. Increase communication and education across disciplines, especially among engineers, hydrologists, economists and ecologists, to facilitate an integrated view of freshwater resources.
4. Increase restoration efforts using well-grounded ecological principles as guidelines.
5. Maintain and protect remaining freshwater ecosystems that have high integrity.
6. And recognize human society's dependence on naturally functioning ecosystems.

Scientific evidence indicates that aquatic ecosystems can be protected or restored by recognizing the following:

- Retention ponds, wetlands, and their connecting ground waters, are literally the "sinks" into which landscapes drain. Far from being isolated bodies or conduits, freshwater ecosystems are tightly linked to the watersheds or catchments of which each is a part and they are greatly influenced by human uses or modifications of land as well as water. The stream network itself is important to the continuum of surfacewater processes.
- Dynamic patterns of flow that are maintained within the natural range of variation will promote the integrity and sustainability of freshwater aquatic systems.
- Aquatic ecosystems additionally require that sediments and shorelines, heat and light properties, chemical and nutrient inputs and plant and animal populations fluctuate within natural ranges, neither experiencing excessive swings beyond their natural ranges nor being held at constant levels.

Failure to provide for these natural requirements will result in loss of species and ecosystem services in the watershed. Scientifically defining requirements for protecting or restoring aquatic ecosystems, however, is only a first step. New policies and management approaches are required.

All watershed projects being considered must be supported by modeling or they should not be approved.