Methodology

The methodology described in Chapter 62-340, F.A.C., is to be applied consistently throughout the state regardless of environmental variation. The criteria of this rule are binding on all political subdivisions of Florida when used in the identification and delineation of wetlands as directed in Section 373.421(1), F.S.:

> "Upon ratification of such methodology, the Legislature preempts the authority of any water management district, state or regional agency, or local government to define wetlands or develop a delineation methodology to implement the definition and determines that the exclusive definition and delineation methodology for wetlands shall be that established pursuant to s. 373.019(17) and this section. Upon such legislative ratification, any existing wetlands definition or wetlands delineation methodology shall be superseded by the wetland definition and delineation methodology established pursuant to this chapter."

Shallow hardwood swamp
(Wakulla County)

The methodology is a best fit combination of the methodologies and practices employed by the water management districts and the DEP prior to the ratification of Chapter 62-340, F.A.C. The wetland boundary may or may not change in your area. It may or may not be in the same exact location as delineated under previous rules and policies. For most areas, the wetland boundary will be very close to where it had been previously delineated by the Water Management Districts.

In the following discussion, Chapter 62-340, F.A.C., will be covered section by section. Supplemental information is provided which should be read in conjunction with the text of Chapter 62-340, F.A.C.

Intent (section 62-340.100, F.A.C.)

The intent of Chapter 62-340, F.A.C. is to provide a wetland delineation methodology which can be consistently applied throughout the state of Florida. The phrase *combined landward extent* means the total extent of area under the wetland regulatory jurisdictions of the WMDs and the DEP. This rule was developed by a working group of representatives from the DEP and the five WMDs with the aid of representatives of the regulated public and environmental organizations. Careful attempts were made to provide a methodology which reflects the wetland and surface water jurisdictional authority of the DEP and the WMDs as it existed immediately prior to the effective date of Chapter 62-340, F.A.C., July 1, 1994.

The focus of the methodology is on the use of vegetation, hydric soil characteristics and hydrologic indicators to delineate those areas which meet the definition of wetlands provided in subsection 62-340.200(19), F.A.C.

The department is vested with the responsibility of maintaining the consistent statewide application of Chapter 62-340, F.A.C., and intends to be actively engaged in this responsibility.

Emergent wetland vegetation associated with a lake (Marion County)

Definitions (section 62-340.200, F.A.C.)

When interpreting or implementing Chapter 62-340, F.A.C., the definitions provided in this section of the rule shall apply. Additional information and guidance is provided below for some of the definitions. **The definitions are listed by the same numbers used in the rule. Not all the definitions are included below.**

(1) ***Aquatic plants*** are free floating or underwater plants. Some of the free floating plants are *Lemna* and *Spirodella* (duckweeds), *Eichhornia crassipes* (water hyacinth), *Pistia stratiodes* (water lettuce), and *Salvinia*. Examples of underwater plants include but are not limited to *Hydrilla* and *Vallisneria americana* (eel-grass). *Nymphaea* spp. (water lilies), *Nelumbo* spp. (lotus), *Nuphar luteum* (spatterdock) and other emergent plants, which send a leafy stem above the surface of the water, are not considered aquatic plants for the purposes of Chapter 62-340, F.A.C. Aquatic plants are not considered when determining the dominance of plant species or in the determination of strata. The presence of aquatic plants may be considered as a hydrological indicator in accordance with subsection 62-340.500(3), F.A.C.

(2) ***Canopy*** is often referred to as the top layer of the forest. The definition in the rule further qualifies the characteristics as woody plants or palms with a main trunk at least 4 inches in diameter (four inches wide) at a point 4.5 feet above the base of the tree (Diameter at Breast Height - DBH). If the tree is on a slope, the diameter is measured from the midpoint of the base of the tree on the slope. Vines are not considered for this or any other vegetative evaluation.

(4) ***Facultative plants (FAC)*** are plants which are so problematic in their distribution as to render them inappropriate for indicating inundation or soil saturation. Specifically included are exotic plants with a weedy distribution. Facultative plants are not used when evaluating the dominance of plants species or when determining the appropriate strata.

(5) ***Facultative wet plants (FACW)*** are plants which under natural conditions typically exhibit their maximum cover in areas subject to surface water inundation and/or soil saturation, but can also be found in an upland.

(6) ***Ground Cover*** includes all plants which are less than 4.5' tall or have a DBH of less than 1". Vines are not considered. Groundcover is the lower most of the three layers of vegetation which are evaluated for the vegetation analysis.

(7) ***Ground truthing*** or on-site evaluations of the wetlands and their parameters are necessary to accurately delineate a *wetland*. The conditions of the *wetlands* and the boundaries observed should be documented during the ground truthing of the site.

(8) ***Hydric soils***. A soil is inundated when the water table is at or above the soil surface. A soil is flooded if the water is moving across the soil surface as in a slough or on a floodplain. A soil is ponded if the water is sitting on top of the soil

with no movement to an outlet as is the case with some depressions. A soil is saturated if the water table is within 6 inches of the soil surface for sandy textured soils or within 12 inches for loamy or clayey textured soils. These water table depths for each textural category will support a capillary rise of water to the soil surface. If the duration of saturation or inundation is long enough, (greater than several weeks during the growing season), the oxygen content of the water in the topsoil will be exhausted. The subsequent anaerobic conditions in the soil result in an accumulation of organic matter and the reduction and movement of iron which produce a soil morphology that is identifiable in the field (*hydric soil indicators*). Hydric soil information is available through the county Natural Resource Conservation Service (formerly the Soil Conservation Service) office.

(9) ***Hydric Soil Indicators*** are those listed in *Florida's Ecological Communities* (1992). It is highly recommended that all who evaluate hydric soil seek professional training provided by qualified soil scientists. Hydric soil indicators must be verified on site, throughout the site.

(10) ***Inundation*** pertains to all surface water at or above the soil surface.

(11) ***Obligate plants*** are those plant species which under natural conditions are only found or achieve their greatest abundance in an area which is subject to surface water inundation and/or soil saturation. Some obligate plant species can be observed in an upland, especially under a controlled environment. Included in this category are the littoral plants and emergent aquatics, such as *Nymphaea* spp. (water lilies), *Nelumbo* spp. (lotus), and *Nuphar luteum* (spatterdock).

(13) ***Riverwash*** includes areas generally considered to be alluvial.

(14) ***Saturation.*** The extent to which shallow water tables can create anaerobic conditions throughout the soil profile is to a great extent a function of the soil texture. Soil texture determines the size and nature of open pores which exist within the soil. Capillary action, the adhesion and cohesion of water molecules in these pores, results in the lifting of water from the water table towards the soil surface. The smaller the pores, the greater the distance which capillary action will lift water. In order for water to reach the soil surface via capillary action, a water table must be closer to the surface in sandy soils than in finer textured soils because the soil pores are larger in the sandy soil.

(15) ***Seasonal High Water*** means the elevation to which the ground and surface water can be expected to rise in a normal wet season. Indicators of seasonal high water may be observed whether the mark is above or below ground. The characteristics may not always be obvious or even present. The presence of hydrologic indicators must be used with reasonable scientific judgement. Seasonal high water is particularly applicable to the delineation of isolated wetland systems.

(16) ***Subcanopy*** is generally thought of as the smaller trees and tall shrubs in the forest. It is typically the middle of the three vegetative layers considered in the

vegetation analysis. A plant must have a main stem more than 4.5 feet tall and greater than 1" in diameter to be in the subcanopy. Most species of palms will not be in the subcanopy category if their diameter is greater than 4.5" when the trunk is at least 4.5 feet tall.

(18) ***USDA - SCS*** is the former United States Department of Agriculture - Soil Conservation Service, now know as the **USDA - Natural Resource Conservation Service (USDA - NRCS)**.

(19) ***Wetlands.*** This definition lists the types of areas that are intended to be considered *wetlands* and areas which are generally not intended to be considered *wetlands. Wetland types* are quite variable within the climatological extent of Florida. *Other similar areas* includes less common *wetland types* and *wetland ecotonal* areas that may have a mixture of characteristics of adjoining communities. Please refer to the *characteristics of wetlands* as provided in the methodology to determine if these areas are wetlands or uplands in accordance with this definition. Please note the word *generally*. *Generally* means *in most cases*. All applications of the methodologies should reflect this definition of *wetlands*.

Wetland vegetation along lake margin, *Taxodium ascendens* (pond cypress), *Nymphaea odorata* (white water lily), and *Typha domingensis* (southern cattail).

Delineation Procedures - Tools (subsection 62-340.300(2), F.A.C.)

The tools used in the delineation of wetlands are very specific:

Vegetative Index - This is a list of most plant species which can be found in Florida wetlands. When the term *spp.* is used, it represents all species in that genus within the geographical range of the boundaries of Florida (some exceptions are stated on the list). Each species or group of species is assigned an indicator status of either obligate (OBL), facultative wet (FACW), or facultative (FAC), that can be used in the technical procedures described below. All plant species which are not specifically assigned an indicator status, except for vines, aquatic plants and plants introduced into the geographic area of Florida subsequent to July 1, 1994, shall be considered to be assigned an indicator status of upland (UPL).

Hydric Soil Indicators - Hydric soil characteristics are those identified in Soil and Water Relationships of Florida's Ecological Communities (Florida Soil Conservation ed. Staff 1992). Additionally, included in subsection 62-340.300(2)(c), F.A.C., are specific types of *very wet* soils.

Hydrologic Indicators - Hydrologic Indicators, and conditions thereof, shall be used in accordance with section 62-340.500, F.A.C., using ***reasonable scientific judgement***.

Reasonable Scientific Judgement - Reasonable scientific judgement takes into account all available information and factors pertinent to the surficial hydrology of the area (see introduction). Some of the important factors to consider when applying reasonable scientific judgement include the following: antecedent moisture conditions, vegetation present, hydrologic alterations, landscape position, local knowledge, and climactic conditions.

Vegetative Index (section 62-340.450, F.A.C.)

The *vegetative index* (section 62-340.450, F.A.C.), is used in the identification and delineation of *wetlands* within Florida. At times, the *landward extent of surface waters* will be determined by factors other than wetlands. In these situations, the vegetative index may not be useful (see section 62340.600, F.A.C.).

The use of plant species in the rule shall be consistent at all times with the indicator status of the species on the *vegetative index*. Plants on the *vegetative index* are specifically listed as *obligate* (OBL), *facultative wet* (FACW), and *facultative* (FAC). Any plant not specifically listed is considered an upland plant except *vines, aquatic plants, and any plant species not introduced into the State of Florida as of the effective date of Chapter 62-340, F.A.C.* (subsection 62-340.200(17), F.A.C.).

Vine refers to any plant species which has a twinning or clasping extended growth form originating at the base of the plant and which is dependent on its own accumulated growth or the growth of other plants for support. Some common vines are: *Vitis* spp. (grape vines), *Smilax* spp. (greenbriers), and *Parthenocissus quinquefolia* (Virginia-creeper). *Lygodium japonicum* (Japanese climbing fern) and *L. macrophyllum* are ferns which grow as a vine. *Rubus* spp. (blackberries) are considered canes, not vines.

Aquatic plants will generally not be observed along the boundary of a wetland unless they have floated up with rising water. Because of the general need for support from surface water, the presence of aquatic plants may be used as an indicator of hydrology, in accordance with subsection 62-340.500(3), F.A.C. This is one of the indicators which may reflect extraordinary events. Always use *reasonable scientific judgement* when using this hydrologic indicator.

Facultative species are not used in the evaluation of the dominant vegetative cover (subsection 62340.300(2)(a) and (b), F.A.C.) or in determining the appropriate strata (subsection 62-340.400, F.A.C.). Facultative species can be observed as dominant vegetation in uplands as often as in wetlands. The ***presence*** of facultative species does not provide information on the exact placement of the boundary of a wetland. In general, facultative species may be thought of as neutral. At times certain facultative species or even upland species may develop morphological adaptations to soil saturation and inundation. These structures are often excellent hydrologic indicators and may be used as such independent of the indicator status of the species, provided such use is in keeping with subsections 62340.300(2)(d) and .500(9), F.A.C.

The *vegetative index* (section 62-340.450, F.A.C.) is not a complete list of all the plants which occur in Florida wetlands. Some Florida wetlands are even dominated by non-listed plants. The indicator status assigned to certain common native plants, which are difficult to categorize ecologically, reflects the intent to maintain the wetland delineation within the scope of the wetland definition. (Please refer to the previous discussions under Introduction, Applied Concepts, and Methodology, section 62340.100, F.A.C.). Among the common plants for which the indicator status of *upland* may not accurately express the complete ecological range of the species are: *Pinus elliottii* (slash pine), *Ilex* *glabra* (gallberry), *Quercus virginiana* (live oak), and *Serenoa repens* (saw palmetto). The ecological preference typically exhibited by some species does not reflect the entire range of tolerance to hydrologic conditions which the species may exhibit statewide. For example, the typical ecological preference of saw palmetto throughout most of the state is upland. However, in the Florida Keys, it is found almost exclusively in wetlands (rockland depressions). The wispy, magenta flowered grass, *Muhlenbergia capillaris* (muhly grass) illustrates the reverse situation. It has an obligate status on the *vegetative index* and in south Florida is restricted to inundated and saturated areas, covering extensive wet prairie and similar habitats. Along the north Florida Atlantic coast it is also observed growing on the exposed *upland* coastal sands (these areas would not be delineated as wetlands by the rule). If vegetation were a mandatory criterion under the rule, the inclusion of these and some other species as obligate, upland or wetland indicators would result in the incorrect application of the intent of the wetland definition. The rule provisions regarding choosing appropriate vegetative strata, use of certain soils, commonly referred to as very wet soils, and use of hydrologic indicators in conjunction with hydric soils, are all included in the methodology, at least in part, as a means of addressing the contradictions which can arise because of these plants, which can not be satisfactorily categorized. Remember, it is the methodology as a whole, not any one provision, that is to be used to accurately delineate wetlands as defined by statute.

Please refer to the list of recommended references provided at the back of this manual for assistance in plant identification.

Hydric Soils and Hydric Soil Indicators

A hydric soil is a soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part of the soil profile that favor the growth and regeneration of hydrophytic vegetation (USDA - SCS, 1991). A soil is inundated when the water table is at or above the soil surface. A soil is flooded if the water is moving across the soil surface as in a slough or on a floodplain. A soil is ponded if the water is sitting on top of the soil with no movement to an outlet, as is the case with some depressions. A soil is saturated if the water table is within 6 inches of the soil surface for sandy textured soils or within 12 inches for loamy or clayey textured soils. These water table depths for each textural category will support a capillary rise of water to the soil surface. If the duration of saturation or inundation is long enough, (greater than several weeks during the growing season) the oxygen content in the in the topsoil water will be exhausted. The subsequent anaerobic conditions in the soil result in an accumulation of organic matter and the reduction and movement of iron which produce a soil morphology that is identifiable in the field (hydric soil indicators).

The USDA - NRCS recognizes four (4) of the hydric soil indicators that are evidence of a water table at or above the soil surface for more than several weeks during the growing season. The hydric soil indicators are muck, mucky texture, gley colors, and sulfidic odor. A complete description of these indicators plus additional criteria needed for each indicator can be found in *Soil and Water Relationships of Florida's Ecological Communities* (Florida Soil Conservation Service, Staff, 1992). The remaining hydric soil indicators are recognized as evidence of saturation (Table 1.) of the top layer of soil for more than several weeks. These hydric soil indicators are also discussed in detail in the FL - SCS publication previously mentioned.

Table 1. Hydric soil indicators of saturation

1. Dark surface
2. Organic accretions
3. Oxidized rhizospheres
4. Polychromatic matrix (matrix stripping)
5. Stratified layers
6. Iron and Manganese concretions*
7. Distinct or Prominent mottles*
8. Marl*

* For loamy and clayey textured soils only

Hydric soil sample from hardwood swamp
(Wakulla County)

Hydrologic Indicators (section 62-340.500, F.A.C.)

It is important to read the first paragraph of section 62-340.500, F.A.C. as it qualifies the use of the hydrologic indicators with ***reasonable scientific judgement*** (see introduction). *Reasonable scientific judgement* involves consideration of the conditions causing the indicators. The presence of hydrologic indicators may not provide any information on the normalcy of the event or series of events causing the conditions. Every effort should be made to acquire detailed knowledge about the site prior to considering factors which are directly caused by the immediate presence of water. The lack of certain or specific hydrologic indicators at a site should not be viewed as negative evidence when other indicators are present. It is the total weight of the evidence of wetland conditions on site, provided by the indicators present that, once subjected to reasonable scientific judgement, is used or rejected in establishing the wetland boundary. The following thirteen hydrologic indicators are listed in the rule.

(1) Algal mats are the presence or remains of nonvascular plant material which develops during periods of inundation and persists after the surface water has receded. Algal mats are important indicators of inundation when the vegetation and soil has been altered. In addition, seasonally flooded natural areas such as depression marsh, interdunal swale, rocklands in the Florida Keys and extensive areas of marl/swale of the Everglades may have extensive algal mats as the only hydrologic indicator present. In southwest Florida, algae mats are one of the most important wetland indicators because of the lack of organic accumulation in many of the seasonally inundated communities. Algal mats are often associated with aufwuchs and water marks. The degree to which this indicator is expressed on a site is best interpreted when the rainfall history of the area is known.

Algal mat, rockland depression, Big Pine Key
(Monroe County)

Algal mat in depression marsh, Southwest Florida

(2) Aquatic mosses or liverworts on trees or substrates. Mosses and liverworts are in a group of plants collectively called bryophytes. They lack true roots and leaves and are generally found in shaded, moist environments. Look for epiphytic or epipteric mosses and liverworts along rivers, streams, bayous, sloughs and strands as they typically occur in shaded, forested floodplains that experience prolonged, seasonal inundation. After

Fontinalis sp. on tree base in a riverine swamp water levels have fallen, they will appear as a dark greenish-brown "shaggy" growth, suspended on the bark of trees and the surface of rocks. Typically encountered mosses include: *Brachelyma* spp., *Dichelyma capillaceum*, *Fissidens debilis, Fissidens manateensis, Fontinalis* spp., *Hygroamblystegium tenax*, *Leptodictyum riparium, Sciaromnium lescurii*, and *Sphagnum* spp.; liverworts include: *Porella pinnata*. Identification of dried bryophytes is aided by a hand lens and the application of water to the dried plant body. Two taxonomic references of use are: *Mosses of Florida* by Ruth Schornherst Breen, 1963 and *Mosses of the Gulf South* by William Dean Reese, 1984.

Aquatic bryophytes on *Nyssa ogeche*

(3) Aquatic plants. Aquatic plants are defined in section 62-340.200, F.A.C. as "plants which typically float on water or require water for its entire structural support, or which will desiccate outside of water." Aquatic plants naturally grow in

Eichhornia crassipes (water-hyacinth), an aquatic plant.

areas where inundation is permanent or nearly so. The presence of aquatic plants at a site not presently inundated by water is an excellent indicator that the normal condition at the site is much wetter or, in the case of floating plants, that the site experiences periodic flooding by an adjacent surface waterbody. Look for evidence of aquatic plants in seasonally fluctuating water bodies. Typical floating aquatics include such genera as: *Riccia, Ricciocarpus, Azolla, Salvinia, Pistia, Echhinoria, Lemna, Spirodela, Wolffia*, and *Wolffiella* in seasonally flooded, shallow lakes and ponds or surrounding floodplain forests. An aid to the identification of the previously mentioned plants can be found in R. K. Godfrey, *Aquatic and Wetland Plants of Southeastern U. S.*, 1979 and floras published for a particular area of the state. Water lines and aufwuchs are often also associated with a seasonal drawdown of water bodies.

(4) Aufwuchs is the presence or remains of the assemblage of sessile, attached or free-living, nonvascular plants and invertebrate animals (including protozoans and fresh water sponges) which develop a community on inundated surfaces. Look for the presence of aufwuchs on branches, rocks and other objects that have been submerged.

Aufwuchs on emergent wetland vegetation

Aufwuchs are important indicators in seasonally inundated areas. They often appear as a crust-like growth, sometimes bleaching to white in sunlight during the dry seasons.

(5) Drift lines and rafted debris are vegetation, litter, and other natural or manmade material deposited in discrete lines or locations on the ground or against fixed objects, or entangled above the ground within or on fixed objects in a form and manner which indicates that the material was waterborne. This indicator should be used with caution to ensure that the drift lines or rafted debris represent usual and recurring events typical

Drift line in a salt marsh, Choctawhatchee Bay

of inundation or saturation at a frequency and duration sufficient to meet the wetland definition of subsection 62-340.200(19), F.A.C. When debris has been carried by water and deposited in an area, especially an area foreign to the origin of the material, then the conditions contributing to the observations must be considered. For example, extreme events such as hurricanes and tropical storms may induce unusually high drift lines and rafted debris associated with a storm surge that would not be typical for a particular area. Look for drift lines in tidal areas, rivers and streams that regularly flood, or any wetland where high water deposits or arranges leaves and twigs in a distinguishable pattern. In evaluating rafted vegetative debris, be sure to consider only water-induced evidence.

Rafted debris, North Florida stream

(6) Elevated lichen lines. Lichens are a symbiotic association of a fungus and an alga. Typical lichen forms include crustose, foliose and fruticose. Crustose lichens are flattened and appressed like a film on the bark. Foliose lichens are flattened, thin and lobed. Fruticose lichens are highly branched, forming a shrubby, bushy structure of flattened or cylindrical branches. The crustose and foliose type of lichen are the most commonly encountered on the bark of trees. Lichen are not tolerant of inundation. When water routinely stands around the trunks of trees it abruptly limits the growth of lichens producing a distinct line. These are instructive as part of the

Elevated lichen lines, riverine swamp

information used in determining the ordinary or seasonal high water line for some types of wetlands and other water bodies. Many shallow swamps have a seasonal high water which does not result in prolonged inundation of the tree trunks. These wetlands exhibit inundation as the pooling of water over the swamp floor which is typically at a lower elevation than the base of the trees (see vegetated tussocks and hummocks). Lichen lines would not be anticipated in this type of wetland.

(7) Evidence of aquatic fauna. This indicator considers the presence or indications of the presence of animals which spend all or portions of their life cycle in water. Only those life stages which depend on being in or on water for daily survival are included in this indicator. Remember that some types of aquatic fauna are extremely motile and can move into non-wetland areas because of abnormal conditions such as prolonged flooding. Additionally, some adult aquatic beetles and bugs are capable of flight and readily leave the water during warm humid nights. It is not unusual to encounter these animals in uplands, especially if night lighting is present. Look for evidence in the cast skins of insect larva, especially dragonflies, on emergent vegetation, or remanent molluscan shells (bivalves and snail). Crayfish burrows are excellent hydrologic indicators but must be considered with care as they can occur outside areas defined as wetlands and may only be indicators of a seasonal high water table. When this is the case however, the burrows are, almost without exception, much more numerous on the wetland side of the boundary.

(8) Hydrologic data consists of reports, measurements, or direct observation of inundation or saturation which support the presence of water to an extent consistent with the provisions of the definition of wetlands and the criteria within the rule, including evidence of a seasonal high water table at or above the surface according to methodologies set forth in *Soil and Water Relationships of Florida's Ecological Communities* (Florida Soil Conservation Staff 1992) (see introduction). These observations should be used in conjunction with observations offered by local residents, published reports or data and other hydrologic indicators observed in the field. Provided that a site has not been extensively drained, county soil surveys are an excellent source for hydrological conditions typically associated with a specific map unit.

Dragonfly emerging, (larval cast on the vegetation is a hydrologic indicator)

Crayfish chimney, Withlachoochee River floodplain, (Madison County)

(9) Morphological plant adaptations are specialized structures or tissues produced by certain plants in response to inundation or saturation which normally are not observed when the plant has not been subject to conditions of inundation or saturation. These are often observed in the form of hydric adventitious roots and hypertrophied lenticels. Hydric adventitious roots are typically produced on the stem or trunk of certain plants, when inundated, as an alternative mechanism for aerobic respiration during a period of anoxia in the soil root zone. Once inundation subsides, these roots cease growth. Hydric adventitious roots are seldom observed rooted into soil. The expression of hydric adventitious roots can vary from only a few individual roots to a bushy abundance which may totally cover the stem. Hypertrophied lenticels are abnormally large lenticels which appear as expanded portions of the outer bark of stems and roots. These also appear to function as a mechanism to enhance opportunities for aerobic respiration. Look for hydric adventitious roots and hypertrophied lenticels on stems of flooded plants such as *Myrica cerifera* (wax myrtle), *Ludwigia* spp. (primrose willow) and *Hypericum* spp. (St. John's-wort). Expanded lenticels can also be found on many species of bottomland hardwood trees. Other examples of morphological plant adaptations produced in response to extended wetness are the conspicuous prop-roots of *Rhizophora mangle* (red mangrove), the "knees" of *Taxodium distichum* (bald cypress), and the buttressing of tree bases as exhibited by *Nyssa sylvatica* var. *biflora* (swamp tupelo), *Ulmus americana* (American elm) and *Quercus laurifolia* (swamp laurel oak).

Hydric adventitious roots and hypertrophied lenticels on stem of *Myrica cerifera* (wax myrtle)

Caution: Once a morphological adaption develops it does not disappear if the site is drained and no longer functions as a wetland.

(10) Secondary flow channels are discrete and obvious natural pathways of water flow landward of the primary bank of a stream watercourse and typically parallel to the main channel. These often occur in conjunction with sediment deposition and water marks. Look for these along streams and rivers, especially adjacent to or within floodplain forests.

(11) Sediment deposition is mineral or organic matter deposited in or shifted to positions indicating water transport. The current of a river or stream during high flow

Butressed roots of *Ulmus americana* var. *floridana* (Florida elm), Peace River (Hardee County)

Prop-roots of *Rhizophora mangle* (red mangrove), Key Largo, (Monroe County)

Buttressed bases of *Taxodium ascendens* (pond cypress), (Leon County)

Sediment deposition, Ochlockonee River floodplain, (Liberty County)

carries sediment that is normally in equilibrium with the lower flow velocity and is thus retained near the bottom as bed flow. When a stream overflows its primary bank and occupies the floodplain, the resultant increase in capacity causes a sudden decrease in velocity in the water outside the main channel. This results in the over bank flow dropping its acquired sediment load in the floodplain usually but not always close to the primary bank. Look for material deposition on rocks and plants especially when the deposition is observed on the upstream surface and not on the downstream surface. Sediment deposited as erosion from uplands is not included in this indicator.

Vegetated hummocks

(12) Vegetated tussocks or hummocks are areas where vegetation is elevated above the natural grade on a mound built up of plant debris, roots, and soils so that the growing vegetation is not subject to the prolonged effects of soil anoxia. Look for these in hydric hammocks and in areas of shallow prolonged inundation or where the soil is saturated to the surface for long duration. Tree buttressing is often associated with tussocks or hummocks in saturated soils.

(13) Water marks. Water marks are created by the staining effect of a sustained water elevation. This will appear as a distinct line created on fixed objects, including vegetation. The length of time the object has been inundated influences the expression of this indicator, as does the color and sediment burden of the water. Look for this in conjunction with sediment deposition, especially along rivers and streams. Seasonal high water marks in wetlands and other water bodies often appear related to the elevated lichen lines, aquatic moss and liverwort zones and water stained areas of trees, rocks and other objects.

Water marks in hydric hammock, (Citrus County)

Delineation of Wetlands (section 62-340.300, F.A.C.)

This section lays out the physical evaluations which are conducted on site to determine the placement of a wetland boundary. These evaluations are conducted as a continuous process to produce a spatial line or boundary on the ground. The area landward of this line is the ***upland*** and the areas waterward of this line is the ***wetland.*** The line represents ***the landward extent of wetlands.*** The procedures for evaluating the placement of the boundary line should be conducted using **reasonable scientific judgement**.

Direct Application of the Wetland Definition (subsection 62-340.300(1), F.A.C.)

The first evaluation that is performed before delineating a wetland is to determine if the area meets the *definition of a wetland* as stated in subsection 62-340.200(19), F.A.C. The transition between some wetland areas and the uplands is so abrupt that a visual observation is all that is required to established the wetland boundary. If it is determined that the area qualifies as a wetland and the boundary line can be easily located on site independent of the technical procedures described below, then the wetland boundary may be delineated solely on the basis of the on-site characteristics consistent with the wetland definition. When this section is implemented there is an assumption that the boundary line placement is very close, if not equivalent, to the line which would be determined using the technical procedures. Remember that this is a legal boundary with specific characteristics.

If the boundary line cannot easily be located without a closer examination of its characteristics, then the technical procedures of the rule described below shall be followed and adequate descriptions of the in-situ conditions and the placement of the delineation will be recorded.

Technical Delineation Procedures (subsection 62-340.300(2), F.A.C.)

This section provides the conditions for determining when an area qualifies as a wetland. Before using the technical procedures requiring vegetative dominance, it is important to understand the application of the phrase *appropriate vegetative stratum* as presented in section 62-340.400, F.A.C.

Selection of Appropriate Vegetative Stratum (section 62-340.400, F.A.C.)

The rule employs three vegetative strata: canopy, subcanopy, and ground cover. An explanation of each of these terms is found in the definition section of the rule and was further explained previously. When applying the provisions of the rule that use vegetative dominance, only the vegetation in one of these strata is used to evaluate dominance.

Always begin the process using the uppermost stratum which is present. In some wetlands, such as a marsh, the ground cover is the only stratum present and is therefore the uppermost stratum.

The uppermost stratum is not used if the areal extent (coverage by the vegetation) of the stratum is less than 10% of the area (community) being evaluated. In determining coverage of the uppermost strata, ***facultative*** plants are not considered. For example, a forest where *Melaleuca quinquenervia* makes up greater than 90% of the cover of the canopy would be evaluated using either the subcanopy or ground cover, not the canopy. When the ground cover is the uppermost stratum, the 10% coverage is moot as there is no lower stratum that could be used.

Canopy of *Pinus elliottii* (slash pine) growing under inundated conditions (a wetland!)

The canopy is often the uppermost stratum. Do not separate individual "holes in forest" using this provision unless they represent a separate community type. For example, pine flatwoods, which are open forests, frequently have individual areas of less than 10% areal coverage by the pine tree canopy, yet the forest as a whole usually exhibits 40-60% canopy coverage. Remember, anything less than a 100% closed canopy has some area where there is no canopy: view the forest as a unit when it constitutes a uniform community. Conversely, only include the plants actually growing in a specific community in the determination of appropriate strata. At times, trees in one community may over hang another. A stream is still a water body even if totally covered by overhanging live oaks growing on upland banks. A small upland peninsula extending into a swamp is still an upland even if totally covered by the spreading branches of cypress trees growing in the adjacent swamp.

The uppermost stratum is also not used when the indicator status of the uppermost stratum is clearly in conflict with the hydrologic conditions on-site. A determination that the upper stratum is not an accurate indicator of the true nature of the area being evaluated must be accomplished using reasonable scientific judgment (see Introduction) and requires that the party shifting from the uppermost stratum bear an addition burden of proof. Those wetlands that do not express their wet nature in the canopy can be delineated using this provision. Some severely drained former wetlands that retain their original canopy are also candidates for this provision. When the uppermost stratum is discounted after careful review of all factors related to the on-site hydrology, then the

Seasonally inundated hydric pine flatwoods (a wetland!)

remaining stratum most indicative of the true nature of the site should be used to make the determination. Differences between the indicator status of the vegetative strata do not automatically allow the shifting from the uppermost stratum; additional on-site derived evidence is required. The indicator status of lower strata vegetation can, however, influence the weight attributed to other on-site hydrologic evidence used in arriving at a reasonable scientific judgment regarding whether to shift from the uppermost stratum. Using this principle, the presence of obligate vegetation in a lower stratum would provide greater support to weak hydrologic evidence than would facultative wet vegetation. While facultative wet vegetation can certainly serve as the basis for a lower strata most indicative of the true hydrologic nature of a site, it is a reasonable scientific judgment to expect that the site would exhibit hydrologic evidence that is convincing for the type of wetland community and its location in the state. In evaluating on-site hydrologic evidence, knowledge of the rainfall status of the site is vital because similar expressions of wetness may provide differing degrees of evidence under differing rainfall conditions. Shifting out of the uppermost stratum may only be used to accurately establish the wetland or upland nature of the community not to reflect the immediate (short term) hydrological status of low, occasional wet uplands or drought impacted wetlands.

Points to remember:

- **This procedure shall be conducted when the indicator status of the top stratum appears not be indicative of the normal hydrology of the area being evaluated.**

- **The evaluation must be backed up by sufficient information for the delineator to be sure that the decision to use another stratum is correct.**

- **This evaluation can be used at any time during the delineation procedure.**

Technical Delineation Procedures   (subsection 62-340.300(2), F.A.C.)

The order in which these procedures are used does not matter. The approach used varies from individual to individual. Some will notice the topographic changes and hydrologic indicators before observing vegetation patterns. Others may not make any judgement until evaluating the soil conditions. A knowledge of the applicability of each of the four technical procedures is essential to accurately use the rule. The boundary will be delineated by the procedure (*test*) that distinguishes wetland conditions from upland conditions as defined and represented in the rule.

First, make a determination that the area is a wetland, then starting within the wetland move landward to the point on the slope where the technical procedures of the rule all fail. Variability should be limited to the realm of *reasonable scientific judgement*. If *hydric soil indicators* and *hydrologic indicators* extend beyond the area of listed species dominance, the result must be reviewed with *reasonable scientific judgement*. This allows the evaluation of ecological information as well as all other facts and factors. Once a boundary point is established the delineation typically proceeds parallel to the wetland as an extension of the initial point. Along this boundary fixed points are periodicly marked (flagged) to designate the location. Because the boundary is a continuous feature, the visual line of sight between points must reflect the upland/wetland interface. If it does not, additional points must be flagged. As the delineation continues, remember that **all** the provisions of the methodology are constantly in operation. This requires the delineator to frequently reaccess the technical procedures and use of appropriate strata. Fortunately, most wetland delineations only involve a couple of procedures and the pattern in which these are used becomes apparent along the way.

62-340.300(2)(a) **"A" Test:** is the dominance of obligate vegetation over upland vegetation in the appropriate stratum and ecological support for wetland conditions on site in the form of either hydric soils or convincing hydrologic indicators (Figure 1).

OBLIGATE VEGETATION > UPLAND VEGETATION
AND
HYDRIC SOIL CHARACTERISTICS OR RIVERWASH
OR
HYDROLOGIC INDICATORS

Figure 1. The "A" test (obligate plant test) conditions in brief.

62-340.300(2)(b) **"B" Test:** is the dominance by any combination of obligate and facultative wet vegetation at a coverage of 80% or greater (this is the same as saying that the coverage by upland vegetation must be less than 20%) and ecological support for wetland conditions on site in the form of either hydric soils or convincing hydrologic indicators. (Remember, facultative plant coverage is not included in this comparison.) (Figure 2).

OBLIGATE + FACULTATIVE WET $\geq$ 80% (UPLAND < 20%)
AND
HYDRIC SOIL CHARACTERISTICS OR RIVERWASH
OR
HYDROLOGIC INDICATORS

Figure 2. The "B" test (facultative wet plant test) conditions in brief.

The Plant Tests "A" Test and "B" Test

Since vegetation is one of the most apparent aspects of a landscape, the use of vegetation dominance is a frequently used procedure for determining a wetland boundary. Neither the "A" nor the "B" test include the use of facultative vegetation, vines, nor aquatic plants in estimating the percent areal coverage for dominance. Many plant species have a variable tolerance to microenvironmental conditions. The vegetation patterns may reflect zones of hydrology across a landscape which may not necessarily coincide with the wetland/upland boundary. When using vegetative dominance to establish the wetland boundary, be sure to consider the remaining technical procedures prior to formalizing the determination.

Both the "A" and "B" tests have additional provisions that allow a positive demonstration of wetland conditions in the absence of either hydric soil indicators or hydrologic indicators when the upper soil profile has been mechanically mixed or when the substrate is not technically a soil. Use of these additional provisions should only be implemented in consultation with a professional soil scientist present on site.

Reticulate Communities are areas where two or more vegetative communities intergrade in a complex labyrinth. In such a situation, the dominant community should be used for the vegetative test. Examples of reticulate communities include: ecotonal flatwoods with mixtures of mesic flatwoods and wet prairies or savannahs, wetland pine rockland areas of the Keys, and wet prairies along the footslopes of the central highlands and some coastal areas of the panhandle. This is not intended to apply when discreet communities can be delineated, such as wetland flowways through mesic flatwoods. Only one hydric soil indicator or one hydrologic indicator subject to reasonable scientific judgement is needed to support the dominance of hydrophytic vegetation.

62-340.300(2)(c) "C" Test: is the use of specific soil situations to delineate wetlands. In the "C" test certain soil situations are identified as providing sufficient evidence to serve as the sole factor in wetland identification and delineation. The "C" test cannot be used in pine flatwoods, improved pastures and drained soils. Both pine flatwoods and improved pastures are defined for purpose of this section only.

> *"Pine flatwoods shall mean a plant community type in Florida occurring on flat terrain with soils which may experience a seasonal high water table near the surface. The canopy species consist of a monotypic or mixed forest of long leaf pine or slash pine. The subcanopy is typically sparse or absent. The ground cover is dominated by saw palmetto with areas of wire grass, gallberry, and other shrubs, grasses and forbs which are not obligate or facultative wet species. Pine flatwoods do not include those wetland communities as listed in the wetland definition contained in subsection 62-340.200(19) which occur in the broader landscape setting of pine flatwoods and which may contain slash pine."*
>
> *"Improved pasture shall mean areas where the dominant native plant community has been replaced with planted or natural recruitment of herbaceous species which are not obligate or facultative wet species and which have been actively maintained for livestock through mechanical means or grazing."*

An area is considered to have drained soils only when the hydrology has been changed to such an extent as to prevent the formation and maintenance of hydric soils as defined in the rule. The definition of hydric soils can be found in the definition section of the wetland delineation rule (Appendix A) and applies to the entire rule. As with any part of the rule, on-site observation and verification of the specific soil conditions mentioned in the "C" test is mandatory.

1. Soil Taxonomy
From the soil classification system (Soil Survey Staff, 1994), six great groups and one soil order are identified as having soils that form only under very poorly drained conditions. The taxonomic names of the six *great groups* are: ***Argiaquolls, Hydraquents, Humaquepts, Sulfaquents, Umbraqualfs,*** and ***Umbraquults***. ***Histosols*** are the order that is included in this section. The organic soils belong to this order. All Histosols are included in the "C" test except the Folists, which do not form under saturated or inundated conditions. In Florida, Folists are found only in the Keys and lower Dade County. The six great groups and the organic soils can be considered to be the wettest of the hydric soils and are always found in wetlands under natural drainage conditions.

Soil Taxonomy has an hierarchial scheme similar to the biological classification used for plants and animals. Moving from the broadest classification level to the most specific, the classification levels of *Soil Taxonomy* are: order, suborder, great group, subgroup, family, and series. The great group level is the third level of soil classification. Within each of the six great groups mentioned in the "C" test, there are from 2 to 10 soil series in Florida. The soil series is the lowest level of classification. Common names are used for soil series which were named after towns, rivers, lakes, or geologic formations in the vicinity of where the soil was first identified as a discrete soil entity. For example, in Florida, the three soil series (Turnbull, McKee, and Riomar) are classified as belonging to the great group *Hydraquents* and can be used in the "C" test. The taxonomic names of the various soil series within a county can be found on the map legend between the text and the aerial photographs in the county soil surveys produced by the USDA - NRCS. Field verification of the great groups within a soil map unit is required. The boundary of the great group or organic soil will define the limit of the wetland using the "C" test.

2. Saline sands
Saline sands are tidal areas that have limited or no plant growth due to high salt concentrations. These areas are generally tidal, very poorly drained, and are found in high marsh areas.

3. Frequently Flooded and Depressional Map Units
Soil mapping units are not a part of soil classification, but are a subdivision of the soil series based on different land use and management. Map units generally have inclusions of other soils series and non-soil. The **frequently flooded** and **depressional** map units are also included as stand-alone criteria in this section of the rule. The county soil surveys have a list of map units in the map legend. Once an area has been located on the aerial photographs, the map unit can be identified from the map unit symbols. Because of the constraints on the detail of soil maps, the boundaries of depressional and frequently flooded areas must be verified in the field. The boundary of the hydric soils within this map unit is the field adjusted boundary of the frequently flooded or depressional map unit. Areas above the adjusted boundary may still inundate or flood but may not meet the duration requirements necessary for wetland formation. Other areas above the boundary may also be inclusions of upland soils within the map unit that

neither inundate nor flood. The boundary of a depressional or frequently flooded map unit can be systematically checked by examining the soils along a traverse moving uphill from the center of the map unit. A soil scientist from the USDA - NRCS can serve as a third party to settle boundary disputes between the petitioner and the regulating agency. Unlike the field test for the great groups and organic soils, the soils within the map unit need only be hydric and proof that they are the soil that the map unit defines is not necessary.

62-340.300(2)(d) "D" Test : is the presence of a hydric soil and a hydrologic indicator (Figure 3). Using this procedure, the presence of a hydric soil and a hydrologic indicator, once subjected to reasonable scientific judgement, represents sufficient information for designating an area as a wetland. The application of reasonable scientific judgement is very important in the use of this procedure. Vegetative dominance by species listed in section 62-340.450, F.A.C., is not required in order to use this procedure. Vegetation present on site may however be considered in the application of reasonable scientific judgement. A list of 13 hydrologic indicators that meet the hydrologic criteria is provided in section 62-340.500, F.A.C., of the rule. Among the hydrologic criteria, hydrologic data specifies that any evidence of a seasonal high water table at or above the surface according to methodologies set forth in *Soil and Water Relationships of Florida's Ecological Communities* (Florida Soil Conservation Service Staff, 1992) can be used as a hydrologic indicator. This allows the hydric soil indicators of muck, mucky texture, gley colors, and sulfidic odor to act as both a hydric soil indicator and a hydrologic indicator.

HYDRIC SOIL INDICATORS + HYDROLOGIC INDICATORS

Figure 3. The "D" test (Hydrologic Indicators Test) in brief

Altered Sites (subsection 62-340.300(3)(a), F.A.C.)

This subsection is only used when the technical procedures discussed above cannot be applied because of man-induced or natural disturbances or alterations. An activity that could produce this scenario would be the clearing and tilling of shallow wetlands or low uplands when no additional drainage is involved. With the vegetation taken away and the soil surface layer scrambled, it may be difficult, if not impossible to use the technical procedures outlined above.

When this is the case, all alternative information relating to conditions on site immediately prior to the alteration shall be considered. The rule provides examples of reliable sources of information.

Two questions to consider while evaluating the available information are:

1. What was the ecological community in place prior to the alteration? (Was this area upland or wetland before the alteration?)

2. Has the alteration had a temporary or permanent effect on the hydrology of the site? Sites, where exempted or permitted dredging or filling activities have altered the hydrology to the extent that it is no longer a reasonable scientific judgement that the site is a wetland, are not included in the altered sites provision. When the only alteration is the removal of the vegetation from a site, it can reasonably be expected that the site, if no further alterations occurred, can and probably will return to its former condition. Lowering of the soil surface may constitute a change to the on-site hydrology.

Wetland Hydrology (section 62-340.550, F.A.C.)

While the rule does not, can not, and should not provide a numerical criteria for the use of the presence of water in the identification and delineation of wetlands, the absence of water under certain circumstances may be used in a backstop mode to evaluate sites which have possibly lost wetland functions through excessive drainage. This provision is used only to refute a wetland delineation established by the other procedures of the rule. The numeric criteria used in this section were developed from standards which, under typical seasonal expression and recurrence, will usually result in the formation of hydric soils. Areas with soils that exhibit hydric soil indicators yet clearly fail these numeric criteria under the terms prescribed in the rule are relict hydric soils. A relict hydric soil does not correlate to current hydrologic conditions extant on site. Use of this provision, through the application of the numeric criteria, requires long-term records or site specific hydrologic data.

Site specific, field-verified, analytic or numerical models may also be used to refute a wetland delineation. A model must demonstrate that the area delineated as a wetland using the procedures of the rule is no longer subject to either regular and periodic inundation or saturation. In order to prevent possible loss of time or waste of capital, the rule mandates that the use of models occur only after agreement by the regulating agency. Rejection of a proposed model by the regulating agency must be accompanied by reasons based on generally accepted scientific and engineering practices.

Surface Waters (section 62-340.600, F.A.C.)

It is the purpose of Chapter 62-340, F.A.C., to provide a methodology for delineating the landward extent of all surface water bodies subject to the legislative intent of subsections 373.421(1) and .414(1), F.S. This intent is expressed in subsection 62-340.600(1), F.A.C., as follows:

> *"For the purposes of section 373.421, F.S., surface waters are waters on the surface of the earth, contained in bounds created naturally or artificially, including, the Atlantic Ocean, the Gulf of Mexico, bays, bayou, sounds, estuaries, lagoons, lakes, ponds, impoundments, rivers, streams, springs, creeks, branches, sloughs, tributaries, and other watercourses..."*

Surface waters include *wetlands* as a subset of the types of surface waters found in Florida. *Wetlands* are those areas defined in subsection 62-340.200(19), F.A.C.:

> *"...those areas that are inundated or saturated by surface water or ground water at a frequency and a duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soils. Soils present in wetlands generally are classified as hydric or alluvial, or possess characteristics that are associated with reducing soil conditions. The prevalent vegetation in wetlands generally consists of facultative or obligate hydrophytic macrophytes that are typically adapted to areas having soil conditions described above. These species, due to morphological, physiological, or reproductive adaptations, have the ability to grow, reproduce or persist in aquatic environments or anaerobic soil conditions. Florida wetlands generally include swamps, marshes, bayheads, bogs, cypress domes and strands, sloughs, wet prairies, riverine swamps and marshes, mangrove swamps and other similar areas. Florida wetlands generally do not include longleaf or slash pine flatwoods with an understory dominated by saw palmetto".*

Some types of surface waters have both wetland and non-wetland components. Some surface waters have no associated wetlands. Some surface waters are all wetland. The technical procedures previously discussed are used whenever the landward boundary of the surface water coincides with the boundary of a wetland as defined. Because of topographic, climatic, and geologic factors, there are areas adjacent to most Florida surface water bodies that regularly flood but which do not develop wetland characteristics. The landward extent of surface waters, when it is other than a wetland, is determined through the location of the *ordinary high water line* (OHWL) for freshwater surface waters, the *mean high water line* (MHWL) for tidal surface waters, and the top of bank or seasonal high water for excavated surface waters as described in subsections 62-340.600(2)(b)(c) and (d), F.A.C. These non-wetland boundary criteria are never used to establish the surface water boundary waterward of a wetland boundary determined using the technical procedures of section 62-340.300 F.A.C. If a wetland is identified landward of the non-wetland surface water boundary, the provisions for wetland delineation can be applied landward and adjacent to the OHWL, MHWL, or top of bank.

Mean high water is an established series of elevations for specific locations along the coast based on the preceding 19 years of tidal data. The elevation for *mean high water* can be located by a professional land surveyor with available NOAA tidal data. The *mean high water line* is the average elevation of the high tides for any particular point on the coast. Half of the normal high tides will be above the MHW line. In some low coastal areas, wetlands occur landward of the MHWL beyond a zone of bare sand created by the continual disturbance of waves. When determining if the upper wetland is either part of the larger tidal waterbody or a separate wetland, *reasonable scientific judgement* should be applied to the analysis of the nature and frequency of the tidal connection. Repeated chronic disturbances such as waves or the disturbances caused by all terrain vehicles do not generally interfere with the placement of the boundary line. Such areas should be evaluated as if those disturbances have not occurred.

Ordinary high water is that point on the slope or bank where the surface water from the water body ceases to exert a dominant influence on the character of the surrounding vegetation and soils. The OHWL frequently encompasses areas dominated by non-listed vegetation and non-hydric soils. When the OHWL is not at a wetland edge, the general view of the area may present an "upland" appearance. This is deceiving in that flooding is common. This area, close to the OHWL, is subjected to an extreme variety of wet and dry conditions. It often proves to be a harsh environment for many plants. This is reflected by the denuded band of sand observed around many Florida lakes.

Water bodies display a cyclic pattern that is expressed through the periodicity of the high and low water elevations above and beyond the typical seasonal variation. The cycle for any given waterbody can be as variable as the water bodies themselves. To determine an accurate elevation for the OHWL, the hydropattern of the waterbody needs to be assessed. This can of course be accomplished through long-term hydrologic data collection. When available, the mean annual flood elevation is an acceptable approximation of the OHWL for flowing water systems. Often, however, this data is not available. An additional way to understand a particular hydropattern is through an evaluation of the age and condition of the plant community on the slope and the structure of the soils. Soil structure is the least used approach as it involves the tedious and time consuming examination and analysis of grain size distribution. Organic content of the soil is also not particularly useful as an indicator for determining the OHWL.

The vegetative characteristics are more prominent and reliable as an indicator in determining the OHWL. Overall, the most productive approach is to locate the least disturbed area along the waterbody and determine the edge of the mature, upland vegetative community. Flooding events are major physical disruption to non-wetland vegetative communities. Between high water events, the community will begin to regenerate, however, there will be an apparent, discrete differential in the age and/or condition of the vegetation in the regeneration zone. Be careful when evaluating the age of the trees. Many species can display their largest form within the OHWL. Some species of pines and *Myrica cerifera* (wax myrtle) provide an excellent example of this situation. *Pinus teada* (loblolly pine), especially, are known to develop fine specimen individuals under conditions that warrant an OHWL evaluation. The condition of the tree rings, if available for analysis, will reflect the age of the trees and periods of high water, drought and fire. *Quercus virginiana* (live oak) is one of the most common species observed along the OHWL edges of lakes. Don't attempt to core the live oaks. The wood is so dense, the core will probably break and it takes an expert in this field to correctly analyze the information captured within the dense rings. Pines are easy to core and it is also easier to interpret the information which the rings reveal. The number of tree rings will provide an age for the tree. Additionally, the size and condition of individual tree rings will correlate to specific events in the history of the tree. Coring, however, is not necessarily good for the health of the tree and permission should be obtained from the property owner prior to any attempt to core a tree.

High water events leave indicators on the vegetative community, including but not limited to those listed in section 62-340.500, F.A.C., which are correlated to the duration and frequency of the events. When determining an OHWL, additional indicators of use include basal scarring and the partial to complete death of the non-wetland woody vegetation caused by repetitive high water events. Live oaks can be observed with the waterward portion of the tree dead and the landward portion of the tree alive. Basal scarring involves the process of bark saturation (and drying) resulting in a swelling and sometimes, fissuring of the bark.

Features of the overall community can also be of use. A distinct or abrupt change in the community composition, character, age, or distribution will often occur near or at the OHWL. Experience with this type of delineation will reveal more subtle characteristics. To be associated with an OHWL indicators should all agree within a narrow elevational zone.

The OHWL as presented in Chapter 62-340, F.A.C., is to be used only for the purposes of surface water regulatory authority under Chapter 373, F.S. The OHWL as that term is used in this text and in the delineation of wetlands has no relationship with the OHWL determinations conducted by the Division of State Lands of DEP in determining the landward extent of state ownership of sovereignty submerged lands.

The St. Marks River, a surface water body, (Wakulla County)

Exemptions (section 62-340.700, F.A.C.)

This section further expresses the legislative intent regarding the regulation of surface waters by excluding from delineation entirely or by limiting the scope of regulatory review in surface waters approved for use as wastewater treatment areas. The details of this section are summarized below in figure 4.

Wastewater Treatment areas except wetlands used for treating effluents under permit.	**Not delineated as Wetlands or Surface Waters** **None of the additional wetland permitting criteria apply**
Small (less than 0.5 acres of combined area) Stormwater Treatment areas	**Not delineated as Wetlands or Surface Waters** **None of the additional wetland permitting criteria apply**
Larger (greater than 0.5 acres of combined area) Stormwater Treatment areas	**Wetland in these systems are delineated** **Only the permitting criteria related to Endangered and Threatened Species apply**
Previously existing wetlands incorporated into Stormwater Treatment areas	**Delineated as wetlands** **Permitting criteria relating to Fish and Wildlife apply**

Figure 4

Mosquito Control (section 62-340.750, F.A.C.)

All areas which were historically *upland* pursuant to Chapter 373, F.S., and which have become *wetland* **solely** because of excavation or impoundment conducted **solely** for the purpose of mosquito control, and which were performed by a governmental entity, shall not be considered wetlands pursuant to Chapter 62-340, F.A.C. In order for the regulating agency to review this exemption, the applicant must provide proof of the conditions as stated in the previous sentence.