PUBLIC COMMENTS AND RESPONSES

The following comments on the draft Interim Atlantic and Gulf Coastal Plain regional supplement to the 1987 Corps of Engineers wetland delineation manual were received by the Corps in response to a public notice issued by the affected districts in June of 2007. Responses to each comment are given in italic Arial font and were developed by the U.S. Army Engineer Research and Development Center with help from the Atlantic and Gulf Coastal Plain regional working group. The Corps of Engineers thanks all those who provided comments on the supplement.

AAA Soil Consultants (Frank C. Watts) letter dated 20 August 2007:

I am very impressed with this *DRAFT Atlantic & Gulf Coastal Regional Supplement to the 1987 Wetland Delineation Manual.* The 1987 Manual is long over due for a revision. I can see that a lot of effort went into producing this good and up to date technical document. I hope my comments will help make this a better technical document.

Response: No response is necessary.

Page 1, 3rd paragraph, last sentence,
I thought EPA had the final authority.

Response: True, but EPA assumes its ultimate authority only in exceptional cases.

Page 2, 1st paragraph, 3rd line
I believe the word "intermittent" would be a better word than "ephemeral". See 1993 Soil Survey Manual, page 245.

Response: "Intermittent" is already included in this sentence.

Page 5, 3rd paragraph, line 8
Add "and the Okefenokee Swamp region of southeast Georgia".

Response: We will make the recommended change.

Page 5, 3rd paragraph, line 10
After "matter" add ", iron",

Response: We will make the recommended change.

Page 5, 5th paragraph, line 3 & 4
Delete "USDA Natural Resources Conservation Service 2006a)"
Add "Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin (2006a)."

Response: The reference is clear and correct as listed.

Page 7, 3rd paragraph under "Outer Coastal Plain (LRR T), line 1

The word "flatwoods" should be deleted and the word "Lowlands' used. A landscape is discussed. See "Wetland Soils … 2001", Chapter 14, page 317, Chapter title" and in "Watts and Carlisle, 1997".

Response: "Flatwoods" is a commonly used term when referring to certain types of vegetation in this region. Furthermore, the rest of the sentence makes a distinction between drier and wetter sites within flatwoods, such that the term "lowlands" would be confusing.

Page 8, 3rd paragraph, last line
Need to include the Okefenokee Swamp.

Response: We will make the recommended change.

Page 11 4th paragraph 1st line
Make your inner coastal plain the upper and middle coastal plain
Make your outer coastal plain the lower coastal plain

Response: We see no reason to change this common wording.

Page 23 – Organic Matter Accumulation
Discussion is made on how to determine fiber content of organic soils. One method NOT discussed from an organic soil sample using the sodium-pyrophosphate extract on white chromatographic or filter paper. A discussion of this is in *Soil Taxonomy* page 88 and the method is on this web page and in my attachment. http://www.fao.org/docrep/x5872e/x5872e0e.htm. Another test for fiber content is to using a 100 ml syringe with measuring part cut in half, a No. 100 U.S.A. Standard Testing sieve, and running water. Put the moist organic sample in the syringe level with the halfway cut, transfer this to a No. 100 sieve, run water through the organic sample until water coming out is clear, test the volume left for unrubbed fiber, finger rub to sample 10 times using normal pressure and rinse again with water, transfer sample back into the cut syringe. Fill syringe level with the half cut beginning at the lesser point, determine amount in ml of the organic sample. The result is amount of fiber after rubbing. SEE my attachment.

Response: The intent of the supplement is not to provide a comprehensive list of methods to determine decomposition in organic soil material, but to present scientifically accepted field methods that can be completed quickly and easily with consistent results and that do not require chemicals and equipment that are not readily available to most wetland delineators. For these reasons, the working group chose to include the methods presented.

Page 24, 1st paragraph, second line
After "Areas in the soil is reduced add "for a long period of time" often …

Response: The supplement is not making a statement about duration of wetness here, simply that gley colors often develop where reduced iron is present.

Page 26, 4th paragraph under Observe and Document the Soil, 8th line
"Having a chroma of 2+" reads better as "having a chroma of more than 2".

Response: No change necessary.

Page 26, 4th paragraph under Observe and Document the Soil, 4th line
Need to discuss what a MOIST soil is. Add "Dry soils should be moisten until color no longer changes and wet soils should be allowed to dry until they no longer glisten. Care should be taken to avoid over moistening dry soil."

Response: We will make the recommended change.

Page 29 – Indicator A2 user note and page 30 – Indicator A3, technical description
A user note, 1st sentence - thickness of a histic epipedon is 8 to 16 inches unless there is rock. This manual states it is 8 inches or more thick. If the thickness is more than 16 inches, the soil is a Histosol. After "8 in. (20 cm)" add "to 16 in. (40 cm)" and delete "or more".

Response: The statement in the Supplement is correct and taken directly from the NTCHS Field Indicators of Hydric Soils in the United States. It is not the intent or purpose of the Supplements to alter the Field Indicators. If you feel that errors exist in the Field Indicators, you should submit your concerns in writing to the National Technical Committee for Hydric Soils as outlined on pages 3 and 4 of the Field Indicators.

Page 30 – Indicator – A3 BLACK HISTIC technical description, 1st line
Same thickness comment as for Page 29. Muck is black, as we have learned in Florida. We have learned in Florida that muck on the soil surface does indicate saturated conditions and mucky peat and peat do not. Mucky peat and peat have a little bit of reddish color or chroma greater than 1, generally chroma 2 or 3 such as 5YR 3/2, 2/2, 5YR 3/3, etc. This indicator is black and muck textured. We do not want a surface mucky peat or peat used as root and leaf mat to be an indicator of hydric soils.

Response: See the previous response concerning Indicator A2 above.

Page 32– Indicator A5, technical description, 2nd and 3rd lines
We have learned in Florida that muck on the soil surface does indicates saturated conditions and mucky peat and peat do not. Delete "mucky peat and peat".

Response: See the response concerning Indicator A2 above.

Pages 50 (Fig. 3-18) and page 51 (Fig. 3-19)
Pictures have too much blue color. Need to work on hue. Often the printer will not print the same color that we see on paper or in the slide.

Response: No change necessary.

Page 66 - Chapter 4 – and Page 67 15th line, Page 73 General Description-1st sentence, Page 114 in 3(f) and 4(c) 5th sentence, Page 116 4(e) 3rd sentence,
It is stated that a water table must be within 12 inches along other requirements to have wetland hydrology. Why are they not using a 6 inch depth for sandy areas? Water between 6 to 12 inches does not produce saturation in a sandy soil because the capillary fringe does not reach up to the surface.

Response: The 1987 Manual describes wetland hydrology as indicated by soil saturation within 12 inches of the surface, without regard to soil texture. This is also the recommendation of the National Academy of Sciences. This is no change from current practice.

Page 85 Figure 4-16
It is not appropriate to have people appearing in a photograph in this manual. It will create problems and questions. So, the COE favors these people. Hey, I want my picture in there. These people are going to get favorable wetland determinations?

Response: The people were used in lieu of a scale bar. However, we will try to find a different photograph.

Page 88
Hydrogen sulfide odor should not be used as a hydric soil indicator and a wetland hydrology indicator. Delete this page.

Response: As stated in the supplement, this indicator is strong evidence for current saturation and anaerobic conditions, which meets the definition of wetland hydrology. It also is strong evidence that the soil becomes anaerobic in the upper part and, thus, meets the hydric soil definition. The reviewer is confusing the definitions of each factor (hydric soils, hydrophytic vegetation, wetland hydrology) and indicators of each factor. It is certainly possible for one indicator to represent more than one factor. However, we agree that most hydric soil indicators would make poor wetland hydrology indicators due to the possibility of relict soil features. No change is necessary.

Page 97
General description – change the word landscapes to landforms. Landscapes include all the landforms seen in a single view.

Response: The meaning is clear. No change is necessary.

Page 103 2a 2nd sentence
Add flats landform.

Response: We will make the recommended change.

Page 106 3b 1st sentence and last paragraph, 2nd sentence
Change the word landscapes to landforms

Response: The meaning is clear. No change is necessary.

Page 107 2.
Add depressions landform

Response: No change is needed; depressions are already included.

Page 111 8. Paragraph
The present of a shallow spodic in the soils of the coastal lowlands of Florida and SE Georgia has nothing to do what-so-ever with a soil being a hydric soil or not and that is a fact. I have seen many times. It is only a hydric soil if hydric soil indicators are presence. Delete all of 8. Soils with shallow spodic material.

Response: We agree that the presence of a shallow spodic horizon does not necessarily mean that the soil is hydric. This paragraph attempts to describe certain

soils that may or may not be hydric, but the hydric ones may lack a currently identified indicator. That is why these soils are a problem. We will clarify the wording.

Page 112, last line
I have called this corona boundary diffuse. It is a soil term used in describing soil horizons boundary and has been redefined for hydric soils. This diffuse boundary is defined in the glossary of Hydric Soils of the US, version 6.0 Page 30 using 2 mm as the break point thickness. There are many definitions of corona in the dictionary and they do not apply to soils. I do not find it defined neither in the NTMHC's Hydric Soils of the US nor in the Soil Science Society of America's *Glossary of Soil Science Terms*. In the Soil and Water Society's *Resource Conservation Glossary* it is define as "Corona effect: Electrical charging (ionization) of air near pointed objects or conductor." On the web I found it related to music and vacation places, however, I did find one good site: http://ww2010.atmos.uiuc.edu/(Gh)/guides/mtr/opt/wtr/coro.rxml This corona is a very new term, not well defined and needs to be well defined to be used in this manual. It could be used as an example to describe diffuse boundary.

Response: The word "corona" is descriptive and not intended as a technical term. The word "diffuse" is also used in this paragraph. No change is needed. Further descriptions are given in the references cited (Vepraskas 1992 and Hurt and Galbraith 2005).

Berg Oliver Associates (Kimberly McBride Beasley) letter dated 22 August 2007

The supplements are necessary to address regional wetland characteristics… . It does a good job of addressing the many circumstances wetland delineators encounter in the field. …it is good to see them addressed in a fair and accurate manner.

Response: No response is needed.

The list of Hydric Soil Indicators is overly detailed and not practical. The list should be simplified.

Response: These indicators were developed by the National Technical Committee for Hydric Soils and are used without modification in the supplement. They are more complex, but also more accurate, than the simplified indicators in the 1987 Manual. Use of the new indicators will require training and experience.

It should not be necessary to require assistance and employ a soil scientist on a typical wetland delineation in order to accurately complete the soils portion of the Data Form.

Response: We agree. The indicators were written by soil scientists in a way that any experienced wetland delineator should be able to apply. There are very few situations that might require the assistance of a soil scientist, and these situations (and more) also existed under the previous 1987 Manual indicators.

I support the vegetation and hydrology portions of the Data Form, however I believe the soils portion is not practical.

Response: See the previous responses.

Berg Oliver Associates (Aron Edwards) letter dated 23 August 2007

Within the Hydrophytic Vegetation Indicators section, the Supplemental Manual states that (+) and (-) modifiers will not be used. In the Houston area I have found that these modifiers often aid in delineating marginal areas. For example yaupon (*Ilex vomitoria*) is a shrub that is rarely found in a wetland. It normally grows on the upper, drier side of the wetland. If the modifier for yaupon is not used, then it would be considered a hydrophytic species, thus dynamically changing wetland acreages throughout the Houston area if the hydrology and soils meet the criteria. Many of the areas that yaupon dominate are near creeks and rivers and help determine the wetland line. In this area, I feel that these modifiers are necessary for accurate determinations.

Response: It is true that disregarding '+' and '-' modifiers has the potential to change some hydrophytic vegetation decisions. However, there are two main reasons for the change: (1) to make the dominance test consistent with the prevalence index, which does not use the modifiers, and (2) because they imply a level of accuracy in wetland-indicator-status assignments that does not exist with available data. Use of '+' and '-' modifiers requires that plant species be divided into 11 categories of wetland indicator status (OBL, FACW+, FACW, FACW-, FAC+, FAC, FAC-, FACU+, FACU, FACU-, and UPL). Data do not exist to make such fine distinctions for the vast majority of species. Furthermore, the assignment of '+' and '-' modifiers was commonly used by plant list panels to resolve differences of opinion among panel members; they often were not based on ecological data and are unlikely to reflect real differences in the affinity of plant species for wetlands. Recognizing the problems associated with +/- modifiers on wetland indicator ratings, the National Advisory Team for the regionalization project recommended that they not be used in hydrophytic vegetation decisions. Now that responsibility for the plant list has been transferred to the Corps, new procedures are being developed to resolve problematic ratings, including the use of external peer review in some cases. Field testing of the supplement will help to determine whether the simplification of wetland indicator categories will have any significant effect on wetland boundaries after new soil and hydrology indicators are also taken into consideration.

Within the Hydric Soil Indicator section, it was apparent that much of the information needed for each wetland would require assistance from a Professional Soil Scientist. Not being a Soil Scientist, I feel that much of this data is not necessary and that the data required in the original 1987 Manual was much more adequate.

Response: The NTCHS indicators were written by soil scientists in a way that any experienced wetland delineator should be able to apply. There are very few situations that might require the assistance of a soil scientist, and these situations (and more) also existed under the previous 1987 Manual indicators.

The use of aerial imagery is helpful is understanding the site, but using it as a secondary indicator seems uncalled for because the imagery could be taken after a storm event which would make the site seem wetter than normal circumstances. I also feel that Water Marks, Sediment Deposits, and Drift Deposits should remain as secondary indicators, and not placed as primary indicators. They are all subjective and each could result from one single storm event.

Response: Indicator C9 (Saturation Visible on Aerial Imagery) cautions the user to consider the normality of precipitation prior to the photo date. As a Secondary indicator,

at least one additional Secondary indicator must be present to conclude that wetland hydrology is present. Water marks, sediment deposits, and drift deposits are primary under the 1987 Manual and are primary under the supplement. We agree that they may sometimes occur in nonwetlands. However, the 3-factor approach already ensures that areas with indicators of only one of the three factors would not be mistaken for wetlands.

The Supplemental Manual Data Sheet also requires the assistance of a Professional Soil Scientist in many areas. I feel that much of the required information is not as critical when delineating wetlands. It seems unnecessary to need to list the indicators from the 1987 Manual as well as the Supplemental Manual when dealing with the soils. The data necessary for completing a single data sheet would double or triple the amount of field time required for each site. I feel that data sheet should be condensed in a format similar to the 1987 Manual Data Sheets.

Response: The data form does not list indicators from the 1987 Manual. It only lists those developed by the NTCHS. The data form has a simple checklist of hydric soil indicators after the required soil profile description. The general format is not much different from the 1992 data form. However, it is true that a more thorough soil description is needed to use these indicators, thus avoiding many of the mistakes made in the past when evaluating and documenting hydric soils.

Galveston Bay Foundation (Lee Anne Wilde) letter dated 20 August 2007:

…the Foundation is concerned that the Draft Regional Supplement does not break the regions down far enough. … The Foundation feels that at least two of these subregions differ significantly enough in terms of their geologic, physical and biological characteristics to merit being broken down into their own regional supplements. At a minimum the Foundation recommends that Florida and the Texas Gulf Coast each be considered separate regions… .

Response: The question of "How many regions?" has been of great concern in this nationwide project. Every local jurisdiction would prefer to have its own regional supplement but this is not practical when the purpose of the supplements is to help execute a national Clean Water Act regulatory program. Because of their size, Corps districts often extend over 2-4 different regions under the current region map, which breaks the country into 10 regions. More regions would lead to more confusion among wetland consultants, landowners, and regulators. The current region map greatly reduces the amount of information in a supplement that is not relevant to a particular site and has allowed working groups to tailor the indicators to conditions in the region. We believe that this is a great improvement over the 1987 Manual. Further modifications in regions and subregions are possible in the future.

On page 70 of chapter 5, *Difficult Wetland Situations in the Atlantic and gulf Coastal Plain Region*, item 3 addresses "Slightly to Strongly Alkaline Bottomland-Hardwood Vertisols in Texas." The Foundation appreciates the inclusion of these soil types in the revised manual as they are often found in MLRAs 150A and 150B … . However, the Foundation feels that instead of treating these soils as "problematic," they should be treated as a special case and included in chapter 3 to enable field researches to more easily identify this regionally specialized soil.

Response: The purpose of Chapter 3 is to present hydric soil indicators that are used in most cases to identify hydric soils in the field. Because they often lack any of these indicators, "Slightly to Strongly Alkaline Bottomland-Hardwood Vertisols in Texas" are

discussed under problem soils in Chapter 5, along with a procedure for dealing with them in a wetland delineation. Moving this information for one problem soil situation to Chapter 3 would cause duplication and confusion.

On another note, the Foundation is please to note that the Draft Regional Supplement incorporates the NRCS/NTCHS *Field Indicators of Hydric Soils in the United States.*

Response: No response is needed.

Gulf Restoration Network (Jeff Grimes) letter dated 27 August 2007:

Many of the changes to the manual appear to be modeled after the Florida Department of Environmental Protection's (FDEP) wetland delineation procedures. We believe that the Florida tool is very reliable, though question why the Corps stopped short of accepting 2 of the 3 parameters as indication of wetland status as does the FDEP.

Response: The basic 3-factor approach developed for the 1987 Corps Manual has served the needs of the Clean Water Act regulatory program very well and there was no reason to change it.

Table 4-1 on page 70 lists hydrology indicators. We support the Corps' addition of more primary indicators such as water-stained leaves, aquatic fauna, oxidized rhizospheres and others that were not included in the 1987.

Response: No response is needed.

Page 122 discusses the wetland/non-wetland mosaic. We have concerns that large blocks of land that serve as functional wetland with upland inclusions could be subdivided with estimated percentages of these uplands excluded. If this scenario were to occur, the mitigation required for the wetland percent in less anastomose systems would provide dramatically less linear feet of wetland/upland margins that can increase species diversity.

Response: The goal of the 1987 Manual and this supplement is to identify and delineate wetlands accurately. Upland areas, even if included within wetlands, are not directly subject to Clean Water Act regulation and the supplement does not change this fact. However, the biodiversity consequences of wetland destruction (including the effects of wetland/nonwetland mosaics) is one of many factors that Corps districts can and should consider in reviewing applications for permits and determining required mitigation.

Harris County Flood Control District (Michael D. Talbott) letter dated 22 August 2007 and contract report by Crouch Environmental Services dated 21 August 2007:

While the two methodologies examined have similar goals, there are drastic differences in the outcome of the 1987 Manual versus the Draft Regional Supplement methodologies. These differences cause more time and effort to be expended in delineation efforts, which in turn, increase costs. The new methodology may also increase the number and sizes of wetlands delineated which, in turn, will create more permitting difficulties, increased time constraints, and greater mitigation costs. An outline of the major differences between the two methodologies is presented below.

Response: See responses to individual issues below. We thank the Harris County Flood Control District for providing the report by Crouch Environmental Services that compares results of a wetland delineation at one site using previous guidance under the 1987 Manual versus the proposed guidance under the 1987 Manual and new Regional Supplement.

Utilization of the Prevalence Index may result in the following situations:

- the inclusion of areas that formerly would not be deemed wetlands by re-sampling vegetation, and
- additional time and costs will be required to identify these species using a dichotomous key either in the field or in the office.

Response: The first item is true, but only in limited cases and only if indicators of hydric soil and wetland hydrology are also present. The majority of vegetation decisions will still be made on the basis of the dominance test, just as in the 1987 Manual. However, the supplement seeks to fix a known problem with hydrophytic vegetation decisions that are based solely on dominants, which may not reflect the wetland affinities of the plant community as a whole. When used, the prevalence index does require the identification of most plant species in the sample, which will require a higher level of training and experience in plant identification. Again, however, most vegetation decisions will still be based on dominant species alone.

The Draft Regional Supplement also discards the + or − from plant wetland indicator status. Under the new guidance, species listed as FAC, FAC+, or FAC− are now considered FAC. This means that common FAC− species such as yaupon and loblolly pine will now be included as wetland species in the dominance tests. This new guideline adds a bias for increased wetland acreage. A cursory review of the 1988 United States Fish and Wildlife Service (USFWS) wetland indicator status for species in the USFWS Regions 1, 2, and 6 show that there are 2,720 species that are listed in at least two of the three regions. Of the 2,720 species, 1,318 species (over 48 percent) do not have the same indicator status (ignoring +/− modifiers). If the +/− modifiers are included then 1,683 species of the 2,720 (nearly 62 percent) are different. The Draft Regional Supplement methodologies will include areas currently not considered wetlands under the 1987 Manual by excluding the FAC + and − modifiers.

Response: For a general discussion of reasons for dropping +/− modifiers on wetland indicator status ratings, see the response to the similar comment made by Berg Oliver Associates (Aron Edwards) above (page 6).

Of particular importance to the Harris County area, hydric soil indicator F8 (Redox Depressions) has the potential to increase areas determined to have hydric soils. This hydric soil indicator requires only a two-inch thick layer in the upper six inches to have redox concentrations without regard to soil matrix chroma. Under current methodologies, the soil matrix chroma must be either 1 or 2. This hydric soil indicator is found in wetlands formed in depressional landforms. Mottles in soils in upland situations are commonly observed within Harris County. This new guideline will also force the inclusion of areas that formerly would not be considered wetlands.

Response: Some of the hydric soil indicators in the 1987 Manual are known to be unreliable and obsolete. Others need to be updated and refined in light of an additional 20 years of experience with wetland soils. As part of the new regional supplements, the Corps is adopting the Field Indicators of Hydric Soils in the United States developed by

the National Technical Committee for Hydric Soils. On individual field sites, use of the NTCHS Field Indicators can result in the same or different hydric soil boundaries compared to the 1987 Manual. Depending on the region and the site, the resulting wetland area can be the same, larger, or smaller than that identified under the 1987 Manual. For the one site studied by Crouch Environmental Services, and other similar sites, wetland boundaries expanded due, in part, to hydric soil indicator F8 (Redox Depressions). If you feel that errors exist in the Field Indicators, you should submit your concerns in writing to the National Technical Committee for Hydric Soils as outlined on pages 3 and 4 of the Field Indicators.

Identifying soil indicator status will also require substantially more field time in some circumstances if soil pits are excavated to a depth of 40 inches (i.e. soil indicator A12 – Thick Dark Surface). Deep, dark clays are common in southeast Texas and areas with soils such as Lake Charles clay may require deep excavations to determine if a depleted or gleyed matrix is present beneath the thick dark layer. Deeper excavations require substantially wider holes in order to remove material from the bottom of the pit. Requirements for such deep excavations may require the application of excavating machinery such as powered augers which may damage wetlands and eliminate otherwise qualified individuals due to the demanding physical labor required.

Response: Most hydric soil indicators require excavation depths of 20 inches or less. If greater depth is required to evaluate certain hydric soil indicators, a soil auger or probe can be used. There is no need to use "excavating machinery." We will clarify that examination to greater than 20 inches depth is needed only for soils with deep, dark surface layers and only to evaluate indicator A12.

Many of the hydric soil indicators state "Use of this indicator may require assistance from a trained soil scientist with local experience." Does this mean a local trained soil scientist must approve or assist with the use of this indicator before it can be used? Will the local USACE District staff use these indicators without the approval of a trained soil scientist with local experience? It appears that these soil indicators only complicate the issues and therefore should not be used unless the site falls under the problem area section of the Draft Regional Supplement.

Response: The statement means only that you may wish to get help from a soil scientist if you are not experienced at using the indicator or do not think you can identify it properly. This was true, although unstated, for certain indicators in the 1987 Manual as well. There is no need for "approval" to use these indicators.

Algal mat or crust - within Harris County blue-green algae commonly grows in areas that would not currently meet wetland hydrology requirements. These algal growths are a primary wetland indicator under the regional supplement.

Response: Blue-green and green algae require extended periods of wetness to develop. They are reliable indicators of wetland hydrology when used as part of a three-factor approach to wetland identification. However, not all areas where algae develop will qualify as wetlands. Algal deposits (called "encrusted detritus") were also used as wetland hydrology indicators in the 1987 Manual under "Sediment Deposits" (see paragraph 49.b.5 and Figure 10). The Crouch Environmental Services report erred by not including algal deposits as part of wetland determinations under both the 1987 Manual and the draft supplement.

Inundation and wetland signatures visible on aerial photographs - aerial photographs

are commonly examined for evidence of soil saturation. However, under the 1987 Manual these areas must be ground-truthed in order to meet wetland hydrology requirements. While wetland signatures on aerial photographs are a great tool for delineators, they are, at times, misleading depending on site conditions and conditions at the time of the photograph. The Draft Regional Supplement considers areas that appear to be inundated in aerial photographs to have a positive primary hydrology indicator, and those areas appearing to be saturated to have a positive secondary hydrology indicator.

Response: We agree and the supplement requires that wetness signatures seen on photos be ground-truthed and that the normality of rainfall prior to the photo date be considered. These indicators are used as part of a wetland delineation involving onsite evaluation of all three factors. They are not used solely as an offsite procedure for identifying wetlands.

Oxidized rhizospheres on living roots - under the 1987 Manual, oxidation in living root channels are a secondary hydrology indicator but are primary indicators of hydrology using the Draft Regional Supplement. Within Harris County, oxidized root channels are common, even in upland areas. An additional secondary hydrology indicator is necessary to meet hydrology requirements. Using oxidized rhizospheres as a primary indicator will only increase the number of areas meeting wetland hydrology requirements and result in false indications of hydrology.

Response: We would appreciate any data you have to support the statement that "oxidized root channels are common, even in upland areas." However, the three-factor approach, involving indicators of all three essential wetland characteristics – hydrophytic vegetation, hydric soil, and wetland hydrology – ensures that areas with indicators of only one factor will not be mistaken for wetlands.

Crayfish burrows - Crayfish burrows are a secondary hydrology indicator in the Draft Regional Supplement that is not listed in the 1987 Manual. While crayfish burrows are found in wetland areas, they can also be found in upland areas. There are multiple species of crayfish in the area and some species are more adapted to dry conditions. In order to reach water tables, some species may burrow deeper than six feet below grade. A water table six feet below the surface is not necessarily indicative of wetland hydrology.

Response: We agree that crayfish burrows are not always found in wetlands, but they are usually located within or near the edges of wetlands, hence the secondary status for this indicator. Crayfish are not likely to dig through six feet of dry soil. However, they routinely extend their burrows six feet or more as a shallow water table falls to low levels later in the season. Experience shows that the locations of crayfish burrows indicate where the water table was shallow at some time during the year. In any case, this Secondary indicator requires the presence of at least one additional Secondary indicator of wetland hydrology. Furthermore, the three-factor approach, involving indicators of all three essential wetland characteristics – hydrophytic vegetation, hydric soil, and wetland hydrology – ensures that areas with only one indicator will not be mistaken for wetlands.

Currently, the Draft Regional Supplement and the 1987 Manual give guidance on delineating wetlands under dry conditions, but not under abnormally wet conditions. The upper Texas coast has numerous clayey soils and fairly level terrain. With above normal rainfall, the wetland hydrology indicators such as watermarks, and water stained leaves may be present. During above average rainfall periods, most non-hydric soils can become anaerobic during prolonged inundation. There is no methodology guidance on how to delineate under these conditions other

than waiting until more normal conditions are present. A methodology or clear guidance to use in these situations other than best professional judgment would be useful for delineations in wetter than normal conditions.

Response: "Abnormally wet conditions," unless they occur over a period of several years, are not likely to produce the indicators of all three factors that would be needed to identify the area as a wetland. No special procedures are needed because indicators of all three factors are not likely to be present.

If a sample point meets two of the three wetland indicator requirements (hydrology, vegetation, or soils), the Draft Regional Supplement states the sample point may meet the definition of a "problematic area." The 1987 Manual also has provisions for atypical situations but these atypical situations are limited to circumstances dealing with unauthorized fill, changes in landscape conditions such as beaver dams and changing river courses, and wetlands purposely or incidentally created by anthropogenic activities. The Draft Regional Supplement includes these situations as well as seasonal shifts in wetland status, circumstances created by drought, and circumstances created by grazing. This allows a wider range of natural conditions to be deemed "problematic areas" which may also cause more areas to be identified as wetland such as those areas in grazed pastures.

Response: As you state, some of these "problem" situations are discussed in the 1987 Manual and others are not. However, all of them are routinely considered by Corps regulators in making wetland determinations in this region. The supplement simply gives regulators and the public a consistent procedure for dealing with all kinds of problem situations, thereby reducing inconsistent or arbitrary wetland decisions. These portions of the 1987 Manual will be revised and clarified when all ten regional supplements are completed.

The Draft Regional Supplement does not provide guidance on the delineation of the Ordinary High Water Mark. There is little regulatory guidance on this type of delineation and consequently there is lack of consistency among delineations performed by local consultants. This lack of consistency has resulted in USACE verification delays as numerous projects required re-delineation.

Response: Identification of potential non-wetland "waters of the United States" and the ordinary high water mark are beyond the scope of the 1987 Manual and this supplement. Contact your local Corps district for guidance.

Utilization of the Draft Regional Supplement will require substantial additional time and costs. Re-delineation of a previously USACE verified 18.4-acre site using the Draft Regional Supplement resulted in the following: CESI spent an average of 32 minutes filling out the Wetland Data Sheets prescribed by the Draft Regional Supplement. Past experience indicates that the datasheet prescribed by the 1987 Manual would require approximately 10 minutes. It is not uncommon to have more than 100 datasheets for a wetland delineation. An extra 22 minutes per datasheet would result in an extra 36 hours or 4.6 man-days in the field.

Response: It is true that the new regional supplement requires a higher standard of data collection and documentation than the 1987 Manual did. This was done deliberately to improve the accuracy of wetland delineations and reduce errors. Use of the new supplement may require additional training and experience by wetland delineators. The advantages are expected to include more consistency between users, less confusion

over indicators and procedures, and fewer disagreements between land owners and Corps regulators. That said, we don't think that experienced field staff will need 32 minutes to fill out a typical data sheet.

Increases in the number of plant species recorded on the Draft Regional Supplement wetland datasheet increased plant identification times for those less common species. Additional time will be required to identify these species using a dichotomous key either in the field or in the office.

Response: See the previous response. The identification of non-dominant species is only critical when the prevalence index is used, although the information is useful to the Corps in evaluating any plant community.

CESI timed a soil excavation at the site. It took only 9 minutes to reach a depth of 18 inches. After a total of 44 minutes, the soil sample pit had reached a depth of only 30 inches. To comply with the Draft Regional Supplement, CESI estimates that it may require more than 1.5 hours to dig a hole 40-inches deep.

Response: As stated previously, a soil auger or probe is adequate for sampling below 20 inches, if deeper sampling is needed at all.

While these additional costs may be quite significant, they could be minor when compared to the costs of mitigating for additional wetland acreage. With regards to the test plot, the acreage of delineated wetlands increased by 8.6 acres. Using a conservative estimate of $20,000 per acre in mitigation costs, this could result in additional mitigation costs of $172,000.00.

Response: Mitigation requirements are not a wetland-delineation issue and should be discussed with the Corps district on a case-by-case basis. However, using the new regional supplement should result in no change in wetland boundaries on most sites, but on some sites can result in a wetland area that is either larger or smaller than that determined under the 1987 Manual.

Lake Pontchartrain Basin Foundation (Jill Mastrototaro) dated 21 August 2007:

LPBF is encouraged by the new Draft Supplement and believes the revised guidance improves on and strengthens the 1987 Delineation Manual, especially as it appears to be modeled heavily on the manual used by the Florida Department of Environmental Protection. We hope these improvements will provide Corps' New Orleans District regulatory and enforcement staff with better tools to oversee and enforce Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act in our area.

Response: No response is needed.

Maryland Department of Planning (Linda C. Janey) letter dated 6 August 2007:

The following agencies and/or jurisdictions have been forwarded a copy of your project for their review: the Maryland Departments of Transportation, the Environment, Natural Resources; and the Maryland Department of Planning: including the Maryland Historical Trust. They have been requested to contact your agency directly by September 17, 2007 with any comments or concerns and to provide a copy of those comments to the State Clearinghouse for Intergovernmental

Assistance. Please be assured that after September 17, 2007 all MIRC requirements will have been met in accordance with Code of Maryland Regulations (COMAR 14.24.04).

Response: No response is needed.

Riparian, Inc. (Kathleen S. Haggar) (undated):

Social engineering and land use or Clean Water? How is any of this going to get us cleaner water? When will we know its clean enough? Lots of us think it was fine by 1980. So how have the scientists measured the difference in the water cleaning effects of lawn verses a savanna wetland? What does a BLH actually do for cleaner water that an upland fails to do? Why do we keep seeing marshes swamps and bogs??? (…)

Response: These are not wetland-delineation issues. No response is needed.

Your Map shows the RS for the Gulf Coast and the Atlantic reaching into the mid continent area. How is that specific to the Gulf Coast or the Atlantic? Why is the black soil province of the Mississippi River Valley lumped in with Barrier Islands? Where are the pine savannahas in Illinois? Why wouldn't climate zones, like you see on the back of seed packages, be a better representation of analogous landscape level vegetation groups than this mix of diverse habitats. At least that way you might put Gulf Coast Barrier Islands in the same supplement.

Response: As explained in Chapter 1, delineation regions are based on climate, geology and landforms, plant communities, and other factors that affect the application and interpretation of wetland indicators.

Increased Accuracy: If you were really attempting to increase accuracy and not expand the scope of your jurisdiction, why wouldn't you test this RS on sites that had been delineated under the old method and try the new RS there. If the old and the new are the same then why have an RS. What areas would be captured by the new method? How much more area would be captured? If accuracy can't be defined in terms of a significant improvement in water quality, then why expand the jurisdiction in the RSs?

Response: The testing protocol DOES allow the use of sites that have been delineated previously. However, it is not limited to those sites.

Secondary Hydrology: How many and of what kind of crawfish (RS-Louisiana spelling) mounds over what kind of area are sufficient to call a tract a wetland? There are lots of spp. of crawfish and not all are indicative of wetlands. This would greatly increase areas of wetland hydrology and therefore wetlands. Why aren't red ants, earthworms, and grubs indicators of uplands?

Response: The presence of crawfish burrows, no matter how abundant, would not make an area a wetland. The three-factor approach to wetland identification requires indicators of all three essential wetland characteristics – hydrophytic vegetation, hydric soil, and wetland hydrology. Crawfish burrows are just a Secondary indicator of wetland hydrology.

Vegetation: Vegetation changes that would alter the already biased "FAC Neutral" Test would also have the effect of enlarging wetland hydrology. Now the FAC- are not considered. How is that fair? Many of the other local upland communities are not even rated. They are not on the list

of indicators. They must not count either. In areas that have so many FAC spp. why not use better sense and evaluate sites that are functioning as wetlands and those that are not. The more highly skilled professionals it takes to delineate wetlands, the less credibility any of this program will have. Do you remember marshes, swamps and bogs? We have no more star to steer by. We are all violators if the COE wants us to be now. We have all been told by COE delineators that they can make anything wet they want - and they do.

Response: We do not understand the question.

Why not have special consideration for fast lands? Why are any lands under pump still regulated? Where are we in Louisiana going to live? Will you buy our land so we can move? Are lands inside the levees going to be a special part of the regional supplement? Will anyone publish rules for the identification of hydric soil breakdown in forced pump areas? Land under pump acts differently than non pump areas. The COE sets the elevation of the water in the canals!

Response: These are not technical issues.

Who should field test this RS: If you limit testing to only experienced "botanists and soil scientists" and not experienced delineators, you will not get any comparative information for how this proposed RS will actually work in the filed. Just because someone works for the COE, FWS, NRCS or a university, does not mean that they know beans about actual field decisions made by real delineators. Why not ask some professional consultants to participate, not just NGOs, non-profits, and .gov/.edu. To be a workable RS, the views of private consultants should be heard. I'd participate if I were asked.

Response: Public notices issued by each Corps district provided the testing protocol and data forms that anyone could use to test the supplement and submit the results to the Corps.

Where to test: If you only, or even mostly, test in areas of "high permit activity" you will overlook some very important and unique areas- because those areas are usually appreciated and avoided. If you only sample the areas where you routinely delineated using the 1987 manual any way - at least there was an expectation of how the project area would be evaluated compared to other projects and to the mitigation banks. So why change the system now? Will you go back and re-evaluate the HUs and Credits for existing banks using this system? Will the field test folks relate the new RS to existing banks? If the banks don't score out well or score really high, will they gain or lose credits?

Response: The comment does not relate to the draft supplement. No response is needed.

Location of the tests: Since no two COE Districts delineate alike now or do permitting alike now, don't we already have individual district "current practices?" Will this method standardize those practices? If not then why have a RS? This is why you need consultants to participate in this process - how will you really know what the "current district practices" actually are. If people who do not work in the industry evaluate something they aren't familiar with now how is that a good idea? There are lots of botanists, and wildlife specialists and soil scientists who do not delineate now.

Response: One purpose of the supplement is to increase the consistency of wetland delineations across districts within a region.

Repeatability: How big an area will be tested and how many times will different teams test the same area? Will they use GPS? Will they know the habitat type and its specific sensitivities?

Response: These comments do not relate to the draft supplement. No response is needed.

Schmid and Company, Inc. (James A. Schmid) letters dated 11 and 25 October 2007:

Use of the supplement's provisions concerning field indicators in place of the 1987 Manual (Table 1, p. 2), however, inevitably will change boundaries dramatically at the boundaries of some regulated wetlands where boundary conditions are subtle and small distances have major land use implications. Anticipated changes will yield both increased and decreased wetland polygons in specific locations. I recommend that the Corps and its Districts consider carefully and advise the regulated public of those specific circumstances under which the directives of the supplement are to be used for regulatory purposes.

Response: The intent is to use the new supplement throughout the region. It will replace the indicators used in the 1987 Manual and provide added guidance for problem situations.

The supplement plans to drop the use of + and − from the vegetation indicators (p. 15). That change in effect means that additional plant species will be considered indicative of wetlands; namely, the FAC− species which formerly were counted in the denominator, not the numerator, of the Indicator 1 dominance test. The result will be an expansion of regulated wetlands.

Response: For a general discussion of reasons for dropping +/− modifiers on wetland indicator status ratings, see the response to the similar comment made by Berg Oliver Associates (Aron Edwards) above (page 6).

I am puzzled that the supplement fails to make reference to the 1997 revisions of the NWI plant list, citing instead only Reed 1988. I have heard that a new plant list is in preparation for Region 1, but it is not mentioned in the supplement. Meanwhile, Reed's 1997 list is far more comprehensive in its Region 1 listings and more nearly current in its nomenclature than Reed 1988, and its use has long been required by anyone taking seriously the mandate of the 1987 Manual to use "good judgment".

Response: Currently, the Corps officially uses the 1988 plant list. Although not part of the process to develop regional supplements, a project to update the plant list is underway. Authority for the list has been transferred from the Fish and Wildlife Service to the Corps, plant nomenclature is being updated in cooperation with the USDA Plants database staff, new plant list regions (based on supplement regions) are being developed, and plant list panels are being re-constituted in each region. A web site is under development that will provide public access to all the historical and current information underpinning plant list decisions, as well as new and updated lists. The web site will also be the vehicle for obtaining input from botanists and wetland specialists, and voting by plant panelists.

Hitherto, Corps guidance has authorized use of the NTCHS field indicators, provided those indicators did not bring into jurisdiction land otherwise not identified as wetland under the 1987 Manual. Replacing the 1987 Manual with the supplement presumably is intended to extend wetland jurisdiction to all lands (with hydrophytic vegetation and hydrology) having soils described by one or more of the NTCHS field indicators.

Response: Previous Corps guidance authorized use of the NTCHS hydric soil indicators that were correlated with those in the 1987 Manual or were developed for problem soil situations not addressed in the Manual. Several indicators are the same on both lists. By fully adopting the NTCHS indicators, the Corps is abandoning some unreliable or obsolete indicators in the 1987 Manual.

The supplement adopts the most recent NTCHS/NRCS Field Indicators of Hydric Soils of the US and directs that the latest version (currently, 6.0) should be used for the appropriate resource areas. That strikes me as the correct guidance. Replacing the twenty year old Manual guidance with NTCHS hydric soil field indicators is an excellent step to incorporate the results of much scientific investigation. For field users, this represents a major recalibration of the field indicators for hydric soil.

Response: No response is needed.

I illustrate my concern with one example. Gray and mottled soil colors constitute one of the most commonly used field indicators for hydric mineral soils in the Mid Atlantic region (1987 Manual Paragraph 44.f(2)). Under the 1987 Manual this indicator was summarized as a presence "below the A-horizon or 10 inches (whichever is shallower) of: (a) matrix chroma 2 or less in mottled soils; or (b) matrix chroma 1 or less in unmottled soil" using the traditional Munsell color notation conventions (hue/value/chroma). The value of the soil colors within the diagnostic range of chromas was not specified, and there was no restriction on the color of the layers overlying the diagnostic layer.

Response: Correct.

The NTCHS F3 Depleted Matrix field indicator (p. 51) recognizes thin layers of gray soil near the surface as sufficient for hydric soil identification (2" or thicker, starting no lower than 4" from the surface; or 6" or thicker, starting no lower than 10" from the surface) when displaying 60% or more of the designated low (2 or less) chroma and high value colors. Thus shallow layers of gray soil will qualify as hydric under the supplement, likely encompassing a larger area than under the 1987 Manual indicator.

Response: As you point out, other restrictions apply to this indicator, such as the need for a certain thickness of depleted layer, less than 6 inches of chroma >2 above the depleted layer, etc. It does not follow that use of the indicator will encompass a larger area than under the much more loosely defined 1987 Manual indicator.

NTCHS indicator F8 Redox Depression (p. 54) dispenses with any specification of matrix color, so long as there is a 2 inch or thicker mineral soil layer with more than 5% distinct or prominent pore linings or soft masses starting within 4 inches of the surface. This indicator is likely to extend wetland boundaries beyond what would have been identified under the 1987 Manual. Consistent application of this indicator will be difficult unless a clear definition is provided for distinguishing the "microtopographic depressions on convex landscapes" to which F8 does not apply from the other depressional landforms where it does apply.

Response: The indicator is restricted to "closed depressions subject to ponding." Within those limited areas, the indicator has the potential to identify hydric soils that were overlooked by the 1987 Manual. The indicator is taken directly from the NTCHS Field Indicators of Hydric Soils in the United States. It is not the intent or purpose of the Supplements to alter the NTCHS Field Indicators. If you feel that errors exist in the Field Indicators, you should submit your concerns in writing to the National Technical Committee for Hydric Soils as outlined on pages 3 and 4 of the Field Indicators.

Certain indicators clearly identified as "testing" indicators by NTCHS apparently now are to be used. If so, the revision of the supplement should make clear to users that a soil meeting one of the "testing" indicators is to be counted as hydric. The discussion of TF2 Red Parent Material soils on p. 64 provides a technical definition and user notes. Yet the discussion on p. 107 ends without giving the user any guidance as to which red soils are or are not to be deemed hydric. Is the user to consider depressed landscape positions and the associated colors to represent hydric soils, while the adjacent flats and convex positions with their associated colors are non-hydric? Or are both to be deemed hydric? (If neither were to be deemed hydric, presumably there would be no discussion in the supplement.) For purposes of consistent field application, it would be most helpful to issue clear interim guidance that says "do *this* for now" and then to revise such guidance in the future, if and when better guidance becomes available for defining *"this"*.

Response: "Testing" indicators can be used only under the procedure for problematic hydric soils given in Chapter 5, which requires that indicators of hydrophytic vegetation and wetland hydrology be present and that the area be in an appropriate landscape position. We believe that the procedure is clear. Areas that do not meet these requirements do not have hydric soils even if the indicator is met.

The supplement (p. 22) notes that NTCHS indicators from certain regions may apply in adjacent regions where transition zones overlap the adopted boundaries. It would be helpful if the final supplement provides further guidance as to when users ought to reach out for alternative field indicators, recognizing that NTCHS has authorized all of its indicators for testing (but not for use) in all regions. The intent could be either to maximize or to minimize the extent of soil recognized as hydric. Which should the user attempt to do? Also, if users (on p. 27) are going to be directed to the products of the Mid Atlantic Hydric Soils Committee, then the weight to be assigned to those regional indicators as compared to the national (NTCHS) indicators should be specified for applicable subregions, in the event that differences arise as they have in the past.

Response: It is not true that "NTCHS has authorized all of its indicators for testing (but not for use) in all regions." Testing indicators are restricted to particular LRRs, MLRAs, or other conditions. With the publication of Version 6.0 of the Field Indicators, NTCHS has dropped most of the indicators it previously had listed for testing. The user is expected to use good judgment in transition areas; no blanket rule would fit all situations. Indicators compiled by the Mid-Atlantic Hydric Soils Committee are identical to those approved by the NTCHS. If any differences occur, those of the NTCHS shall be used. The Mid-Atlantic committee's web site is cited in the supplement for the useful illustrations and regional information it presents, not for any new indicators.

It is difficult to determine from the draft supplement how anomalous bright sandy soils (p. 111-112) are to be treated. The example photograph shows a soil that I normally would not recognize in the field as hydric soil, absent thorough documentation of prolonged wetness at that location. For consistent field application, the supplement needs some descriptive limit for anomalous

bright sandy soils comparable to that provided for F20 Anomalous Bright Loamy Soils and a similar limitation based on topographic relationship to tidal waters (p. 63). Acceptance of such indicators will increase the area of hydric soil identified in the field.

Response: We will clarify the wording.

The discussion of glauconitic soils (p. 109) presumably should conclude by telling the user not to rely upon such soils at all, inasmuch as they offer both false negative and false positive results if used as hydric soil indicators. At present the discussion does not reach a conclusion.

Response: These general descriptions of problematic soil situations are not intended to come to a conclusion about whether or not the soil on a particular site is hydric. The procedure for dealing with these situations in the field starts on page 113. With a problematic glauconitic soil, you essentially have four choices: consider it hydric if the landscape position is appropriate for wetlands and there are indicators of both hydrophytic vegetation and wetland hydrology; look for ongoing reduction indicated by a color change upon exposure to the air; use alpha, alpha-dipyridyl to test for reduced iron; or monitor the hydrology in relation to the appropriate technical standard.

Use of the supplement will make changes in the duration of wetland hydrology needed to recognize wetlands. Replacement of 1987 Manual Table 5 with the 2005 Corps groundwater monitoring standard will extend the duration of wetness required to qualify as near-surface hydrology and thus decrease the extent of land meeting the standard for wetland hydrology, at least in disturbed areas. At the same time, recognizing the start of onsite growing season based on observable above-ground growth of two species of nonevergreen plants likely will extend the growing season and thus the extent of land considered to exhibit wetland hydrology.

Response: In the majority of cases, wetlands are identified by observing vegetation, soil, and hydrology indicators and not by applying any hydrologic standard. The option of long-term hydrologic monitoring is available only as a last resort on disturbed or problematic sites where indicators are missing or misleading.

The opportunity presented by the supplement should be taken to further distinguish those hydrologic indicators that show only the extent of possible wetness as opposed to those which show or reflect the actual duration of wetness beyond the minimum threshold of anaerobiosis. Not only surface water and groundwater, but also water marks, sediment deposits, drift deposits, surface soil cracks, moss trim lines, drainage patterns, and the inundation and saturation visible on photographs in and of themselves may do nothing to demonstrate wetland hydrology of the duration necessary to produce anaerobic conditions. Some of these already are recognized as secondary indicators. It would be most helpful to discuss what conclusions can be drawn from each group of indicators. In this region duration of wetness is more significant as a driving force for wetland soil oxygen loss than frequency of wetness. The supplement appears to offer fewer cautions than the 1987 Manual reminding users that all non-wetlands are wet during periods of precipitation, but only wetlands remain wet for long periods during the growing season.

Response: Cautions about the potential for hydrology indicators to be found on non-wetland sites are given in the introduction to Chapter 4 (p. 66) and in the User Notes for many of the indicators. The issue of whether wetland hydrology indicators should reflect duration of wetness is an important one. It bears on the role of wetland hydrology indicators in the 3-factor approach and has been mentioned and discussed in every regional working group, including the Atlantic and Gulf Coastal Plain group. The 1987

Manual and this supplement rely primarily on indicators of hydric soils and hydrophytic vegetation for evidence that the seasonal timing, duration, and frequency of inundation or saturation have been sufficient over a number of years to produce a wetland. This basic approach was also endorsed by the National Academy of Sciences (NRC 1995). The role of wetland hydrology indicators is to provide evidence that water is still getting to the site, giving one confidence that hydrology has not changed appreciably since the plant community and soil characteristics were established. Thus, the 1987 Manual listed only 6 wetland hydrology indicators (observation of inundation, saturation, water marks, drift lines, sediment deposits, and drainage patterns) all of which provide evidence of ongoing wetness but none of which address timing, duration, or frequency of wetness. The coastal plain supplement follows this approach. Hydrology indicators are listed and given primary or secondary ratings based mainly on how reliably they indicate a recent episode of wetness and not necessarily its timing, duration, or frequency. Thus, the 3 factors are designed to work together to identify wetlands, but they do not have the same roles or reflect the same things.

The discussion and photo for indicator B8 Sparsely Vegetated Concave Surfaces (p. 85) raises a matter of usage that could be clarified. If the area is unvegetated or sparsely (<2%) vegetated, then is it a wetland? Mudflats and shallows are waters, but not wetlands unless vegetated. The supplement also affords an opportunity to clarify in general how much rooted vegetation is necessary to distinguish a wetland from shallow open water and deepwater aquatic habitats (if any update of 1987 Manual Paragraph 27 is appropriate).

Response: Indicator B8 defines sparsely vegetated as <5% ground cover. The site may have an additional shrub and/or tree layer and this indicator would still apply. Page 12 says that "For wetland delineation purposes, an area is considered to be vegetated if it has 5 percent or more total plant cover during the peak of the growing season." If not, then one should consider whether the area meets criteria for a non-wetland water of the US.

Hydrology indicator C2 Dry-Season Water Table (p. 93) is not on the Table 4-1 list (p. 70). This indicator requires a considerable leap of faith. I would not infer the presence of growing-season hydrology just because I observe a water table 24 inches below the surface during a dry period. What field monitoring data support this inference? I would not be willing to adopt this indicator unless a massive quantity of data establishing strong correlation with wetland growing-season hydrology exists for sites on all types of soils from New Jersey through Texas. If it is going to be used, then careful attention must be given to defining precisely under what circumstances (season, percent of normal precipitation, etc.) this indicator is to be applied. It would be helpful to articulate a converse indicator to indicate when directly observed water is not an indicator of wetland hydrology (winter wetness, short-term flood periods, etc.) and perhaps other updates to 1987 Manual Paragraph 28.

Response: Indicator C2 is given in Table 4-1 as the first of the Secondary indicators in Group C. We believe that much "field monitoring data support this inference." Seasonal fluctuations in water tables are normal in this region, and water tables in non-wetlands generally drop well below 24 inches during the dry season. Those in many wetlands do, too. Areas that have dry-season water tables between 12-24 inches are very likely to have water tables within 12 inches during the normal wet season. In any case, this is a Secondary indicator and requires at least one additional Secondary indicator to conclude that wetland hydrology is present.

Similarly, indicator D2 Geomorphic Position (p. 96) needs careful definition if it is going to be applied consistently. Features included in this category must be distinguished from the microtopographic features excluded from indicators of hydric soil.

Response: Experienced wetland delineators routinely use landscape features as their first approximation of where wetlands are likely to be located on an unfamiliar field site. Delineators automatically focus on depressions, drainages, fringes of water bodies, etc., because they know water naturally concentrates in these areas. Indicator D2 is simply a way to formalize these observations by making them a secondary indicator of wetland hydrology. This means that at least one additional secondary indicator is needed to conclude that wetland hydrology is present. Strict limits on the application of this indicator are not needed; the three-factor approach involving indicators of all three essential wetland characteristics – hydrophytic vegetation, hydric soil, and wetland hydrology – already ensures that areas with only one (secondary) indicator will not be mistaken for wetlands.

Indicator D3 Shallow Aquitard (p. 97) would benefit from additional discussion. Is it the intent to identify compacted areas such as wheel ruts and field roads as having wetland hydrology?

Response: No. Examples of aquitards are given in the User Notes.

Data Form - In general the supplement's data form is much improved over that of 1987 and generally tracks the supplement text well. Its use should improve the documentation of conditions along wetland boundaries.

Response: No response is needed.

The soil data form usefully could include space for the requisite (abbreviated) adjectives to describe the abundance, size, and contrast of redoximorphic features to prompt the recording of such information on a routine basis, given the critical importance of those adjectives in applying NTCHS field indicators correctly.

Response: Abundance of redox features is recorded in the "%" column. Size is generally not used in hydric soil indicators and, thus, a space is not needed on the form. Feature contrast is an important part of most hydric soil indicators. However, contrast is not a visual estimate but is based on differences between recorded Munsell colors using the table given in the Glossary. Therefore, a "contrast" column would be redundant. In the interest of space, no column was provided. However, if you wish, you may record the contrast descriptor (e.g., faint, distinct, prominent) in Remarks.

On page 3 the draft supplement states that it is intended to affect "all or significant portions of at least 17 States: Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, Missouri, New Jersey, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia". Small portions of other states are shown in Figure 1 including Illinois and Pennsylvania. (Pennsylvania has a small extent of MLRA 149A near the Delaware River estuary. To landowners in this area, adoption of the supplement may prove highly significant.) I constantly delineate wetlands along the margin of the proposed Atlantic coastal plain region.

Response: We will clarify that the supplement is applicable to those states, too.

I am particularly interested in the rationale for excluding MRLA 149B from the intended coverage of this supplement -- Staten Island and Long Island, New York, and Cape Cod, Massachusetts, among its major components. Ten years ago the NWI plant list review panel included the New York sections of MLRA 149B with more southerly sections of the lower coastal plain included in the draft supplement, while associating Cape Cod with other seaboard lowlands in Massachusetts and Rhode Island, for the purpose of sub-regionalizing the wetland indicator status rankings of plant species. The draft supplement in general does not reveal any results from the revisions of the Region I plant list that I understand are underway at present (I am not aware of the current status of other regional plant lists). Thus it is not possible to consider whether the geographical scope of the draft supplement is consistent with the most recently updated regional plant lists or not.

Response: MLRA 149B was included in the Northcentral and Northeast Region mainly due to its glacial origin and parent materials (i.e., glacial outwash and till) and, thus, its similarities with that region in soil characteristics and problems. The current effort to update the wetland plant lists, described in a previous response, will likely involve a re-thinking of plant list regions and subregions to correspond more closely with those used in the supplements. Currently the 1988 list is the official plant list for this region.

Science Applications International Corporation (Monica J. Stillman) letter dated 10 September 2007:

At first skim it seems to me like most of the information is either redundant with the 1987 manual (in which case why publish it separately as part of a regional supplement?), or that it constitutes changes that are not really reflective of regional conditions but could be considered on a nationwide basis - e.g., the prevalence rule for vegetation.

Response: It was not our intention to duplicate information in the 1987 Manual. The supplement contains mainly lists of indicators of hydrophytic vegetation, hydric soil, and wetland hydrology that are intended to replace those given in the Manual. Other sections of the supplement provide clarification and supplemental guidance for making wetland determinations in the region. It was not clear initially that regional working groups would choose to include the prevalence index as a hydrophytic vegetation indicator in all regions considered so far. There may be opportunities to reduce duplication in the future after all 10 supplements are completed.

Is it the intention of USACE to eliminate the 1987 manual and replace it in entirety with regional supplements?

Response: No. As detailed in Chapter 1, only certain paragraphs in the 1987 Manual are replaced by the supplement. The two documents are designed to work together.

A far more preferable alternative would be to maintain the 1987 manual and publish regional guides that consist of (a) a very clear, concise list of deviations from the 1987 manual that are applicable to a particular region due to specific regional conditions (which should be clearly documented), and (b) guidance for problematic conditions typical of the region such as difficult soil series or plant communities. It is my sense from the draft southeast region supplement that such guidance would pretty much be condensed down to guidance on various soil types that occur in the region that do not provide straightforward soil profiles that can be readily interpreted using the 1987 soil criteria.

Response: In essence, that is what we have done in this regional supplement. However, rather than a confusing list of "deviations" from the 1987 Manual, the supplement presents completely revised and updated lists of wetland indicators, replacing those in the Manual. And Chapter 5 gives "guidance for problematic conditions typical of the region …". In the Coastal Plain region, this guidance goes beyond just soils issues.

TCB, Inc. (Timothy Love et al.) representing the "Consultant Committee to Review USACE Guidance" letter dated 22 August 2007, plus appendices:

The 1987 Manual is divided into three sections (offsite, onsite, and comprehensive) so that rapid identification of the boundaries of wetlands can be achieved using various methods. This Supplement combines the elements of the onsite and comprehensive methods, which makes the new method less clear to those attempting to utilize it.

Response: We do not understand the comment. The supplement is used only in onsite wetland delineations, under either the routine or comprehensive methods as described in the 1987 Manual. There is no change in approach.

It add layers of detail that seem to purposefully obscure the separation of wetlands from non-wetlands. For example, the suggested methodology 50:20 rule for determining hydrophytic vegetation is cumbersome. In the upper Texas coast, hydrophytic vegetation is the norm. There is no need to document this natural phenomenon in detail when it is already obvious that dominant hydrophytic vegetation is present. The 1987 Manual and subsequent guidance allow the use of percent areal cover and basal area for total plant cover. This methodology is quick and relatively accurate. Only if an area's vegetation is in question should the more detailed methodology should be used.

Response: We agree that the new supplement requires a higher level of observation and documentation. This was done in an effort to avoid errors seen in the past and to give Corps regulatory staff a better understanding of site characteristics. There are still opportunities to reduce the level of documentation in obvious situations but you run the risk that the Corps will be unable to catch errors that could have significant effects on project plans.

The elimination of + and - modifiers from the wetland indicator status of plant species means that plants that routinely are not found in wetlands (e.g., loblolly pine [*Pinus taeda*] and yaupon [*Ilex vomitoria*]) will now be included as hydrophytic plants. In the upper Texas coast, loblolly pine and yaupon are typically used to differentiate the upland/wetland boundary (see Appendices A and B). Dropping the + and - modifiers blurs identifying the wetland boundaries, and forces the delineator to inaccurately enlarge the wetland boundary. Either the wetland indicator status of these plant species needs to be modified to FACU or the current FAC- plants need to be excluded from hydrophytic plant calculation.

Response: For a general discussion of reasons for dropping +/− modifiers on wetland indicator status ratings, see the response to the similar comment made by Berg Oliver Associates (Aron Edwards) above (page 6).

We also believe the draft Supplement is trying to cover too broad a geographic area. The Gulf Coast of Texas and the Atlantic coast of New Jersey are quite different, while the Floridian Peninsula differs from both. We recommend the manual be divided into at least three regions: LRR T and LRR P west of Alabama River including LRR O; LRR T and LRR P east of Alabama River; and LRR U.

Response: See the response to the similar comment by Galveston Bay Foundation above (p. 7).

A cursory review of the 1988 USFWS wetland indicator status for species in the USFWS Regions 1, 2, and 6 show that there are 2,720 species that are listed in at least two of the three regions (Appendix C). Of the 2,720 species, 1,318 species (over 48 percent) do not have the same indicator status (ignoring +/- modifiers). If the +/- modifiers are included, then 1,683 species of the 2,720 (nearly 62 percent) are different. This diversity of species status suggests that the original reviewers of wetland indicator status believed that there is regional variability of individual species based on the ability to tolerate wetland conditions. We believe that difference should be maintained.

Response: Changes to the plant list are beyond the scope of the supplement. There is an ongoing project to update the nomenclature and regions used on the plant list and to re-evaluate the indicator status of problematic species. In the future, there will continue to be subregional differences in wetland indicator status of species on the plant lists. New procedures will ensure that these differences are due to real differences in the ecological response of species to wetland conditions in different areas.

The draft Supplement also adds complexity to soil identification. Digging soil pits to a minimum of 20 inches deep and occasionally to a depth of 40+ inches to determine if there are layers or materials present that might restrict soil drainage can add additional time to document each soil pit (Appendix B). It may also require mechanical equipment to dig to this depth during normal summer dry conditions on the upper Texas coast. Digging this deep also selects against the less physically enabled.

Response: The basic advice for digging a soil pit is "In general, the hole should be dug to the depth needed to document an indicator or to confirm the absence of indicators [p. 26]." Generally, an "approximately" 20-inch hole is recommended although sometimes deeper examination is needed. When deeper examination is needed, a soil probe or auger can be used. "Mechanical equipment" is not needed.

Digging this deep also appears academic in nature and should not be required. If the soil profile closely matches the identified mapping unit, then the NRCS has already confirmed the soil series. We do agree there are areas that are not well mapped or have known soil problems, and that it may be necessary to dig deeper than the current the 16 inches. However, these situations are rare on the Texas coast.

Response: For many reasons, using soil survey maps and hydric soil lists is not a reliable way to identify hydric soils. The National Technical Committee for Hydric Soils strongly recommends against this practice. Hydric soils should be identified by using indicators observed in soil pits.

While the recommendation of digging a hole to 40 inches was made if no indicators were observed in the upper 20 inches, only one indicator (A12) requires a depth greater than 20 inches.

It seems to be unnecessary to dig to 40 inches when all other indicators have failed, unless the purpose of the Supplement is to claim more areas as wetlands than required by the USACE 1987 Manual.

Response: It was not intended and would not be useful to dig to 40 inches whenever indicators were not observed within 20 inches. Digging deeper in most soils would not change the hydric soil determination. As you state, only soils with thick, dark surfaces that might meet indicator A12 should be examined further. We will clarify the wording.

We commend the USACE for accepting the NTCHS Field Indicators for Hydric Soils in the United States. This is a welcomed difference from using only the 1987 Manual hydric soils indicators that are the current usage in the Galveston District. It is appreciated that examples are shown of each indicator allowing the user to differentiate one indicator from another easily.

Response: No response is needed.

One major issue we noted is that both the 1987 Manual and the Supplement do not document how to determine wetland hydrology under above-normal rainfall conditions. Currently, the upper Texas coast is experiencing above normal rainfall … . July 2007 was the 6th wettest July on record … . The upper Texas coast has mostly clayey soils and fairly level terrain. With the amount of above-normal rainfall, the wetland hydrology indicators such as water marks, water stained leaves, etc. are currently present, and will likely remain evident for the next six to eight months, or until the next dry cycle – spring/summer. During this above-normal rainfall period, most non-hydric soils have become anaerobic during this prolonged periodic inundation. There is no methodology as to how to delineate under these conditions other than stating in the Supplement to wait until more normal conditions are present. In virtually all cases, this time delay is not acceptable to many of our clients because of the increased project costs associated with such a delay. They cannot wait. There should be some methodology or clear guidance to use in addition to best professional judgment to be able to delineate under wetter than normal conditions.

Response: Fortunately, delineating wetlands accurately during wetter-than-normal periods is rarely a problem. It is true that wetland hydrology indicators may be more widespread on the landscape than during normal years. However, the delineator should use good judgment in discounting any such indicators known to have been produced by abnormally high water or abnormally prolonged wet conditions. Furthermore, wetland identification is a three-factor approach involving indicators of hydrophytic vegetation, hydric soil, and wetland hydrology. Soils and vegetation are more conservative indicators of wetlands. Those in upland positions are not likely to assume wetland characteristics simply due to one season of wetter-than-normal conditions. Wetland hydrology is defined in part in terms of frequency – wetlands are inundated or saturated at least 5 years in 10, or at least 50% probability of occurrence, over a long-term record. We understand the difficulty, even in normal years, of delineating wetlands on the Texas coastal plain's clayey soils and flat terrain. However, the information sources and guidance given in the 1987 Manual and this supplement are intended to distinguish wetlands from nonwetlands in these areas accurately.

Also, neither the draft Supplement nor the 1987 Manual identify jurisdictional wetlands from nonjurisdictional wetlands. Determining wetland boundaries that do not have a potential of being jurisdictional adds additional cost and time delays that affects our clients. This additional

documentation for wetlands that may not be jurisdictional is adding additional burden on the regulated community without adding additional benefits or protection for the resources they are designed to protect.

Response: Wetlands are ecosystems; therefore, what is or is not a wetland is a scientific question and is addressed with science-based guidance in the 1987 Manual and this supplement. This guidance has remained fairly constant over time, with necessary updates due to improved knowledge of these systems. What kinds of wetlands are "jurisdictional" under the Clean Water Act is a legal and policy issue that may change with new laws, court decisions, and agency regulations. Current guidance on jurisdictional issues is best obtained directly from the Regulatory office of your local Corps District.

In our review, we also found many of the hydric soil indicators state that "Use of this indicator may require assistance from a trained soil scientist with local experience." Does this mean a local trained soil scientist must approve or assist with the use of this indicator before it can be used? And the corollary, can the local USACE district staff use these indicators without the approval of a trained soil scientist with local experience?

Response: The statement means only that you may wish to get help from a soil scientist if you are not experienced at using the indicator or do not think you can identify it properly. This was true, although unstated, for certain indicators in the 1987 Manual as well. There is no need for "approval" to use these indicators.

Chapter 5 Difficult Wetland Situations in the Atlantic and Gulf Coastal Plain Region, we found too academic in nature, has potential for misuse, and adds additional burdens to the USACE districts without adding additional benefits or protection for the resources. We believe that this chapter should be used only for enforcement or comprehensive situations, only for delineating wetlands that are clearly jurisdictional, and not be used for normal delineations.

Response: If "normal" delineations are done properly, they will not become enforcement issues or require the added effort and expense of comprehensive determinations. The guidance in Chapter 5 is intended to avoid errors that can result when wetland indicators are missing or misleading due to human disturbance or natural causes. Wetland delineators should be aware of the situations described in Chapter 5 during every wetland delineation, so that they can avoid errors that could lead to project delays.

Page 12, Paragraph 3, Sentence 3
While it stated that the vegetation sampling is designed to characterize the site rapidly without the need for detailed scientific study or statistical methods, vegetation sampling performed in accordance with the Supplement will increase the amount of time spent in the field. The cumbersome Prevalence Index requires the identification of all species in the 30-foot plot area, not just the dominant species. This test is recommended for every plot that does not meet the hydrophytic vegetation criteria, increasing the field time and costs to the client on every sample plot.

Response: This comment is incorrect, at least in part. The supplement does not recommend using the prevalence index on every plot that fails the dominance test. It is recommended only if indicators of hydric soil and wetland hydrology are present. The majority of vegetation decisions will still be made on the basis of the dominance test, just as in the 1987 Manual. Use of the prevalence index is intended to fix a known problem

with hydrophytic vegetation decisions that are based solely on dominants, which may not reflect the wetland affinities of the plant community as a whole. When used, the prevalence index does require the identification of most plant species in the sample, which will require a higher level of training and experience in plant identification. Again, however, most vegetation decisions will still be based on dominant species alone.

Page 14 Definitions of Strata
All methods for grouping plants are arbitrary, however, trying to estimate if a stratum has less than 5 percent cover during the peak of the growing season when the growing season is year round is also arbitrary. It is appreciated that each vegetation stratum is clearly defined.

Response: This statement ensures that areas with nonpersistent plant cover will not be overlooked in wetland decisions. The 5% is an arbitrary but convenient threshold.

Page 15 Hydrophytic vegetation indicators
Dropping the plus (+)and minus (-) modifiers from the wetland indicator status of plant species means that plants that routinely are not found in wetlands (e.g., loblolly pine and yaupon) will now be included as hydrophytic plants. In the upper Texas coast, loblolly pine, yaupon and numerous other species are typically used to differentiate the upland/wetland boundary. Where they stop growing is often at the perimeter of a wetland. Either the wetland indicator status of these plant species needs to be modified to FACU or the current FAC- plants need to be excluded from hydrophytic plant calculation. The removal of the + and - indicator on facultative vegetation is a less than subtle method of forcing the expansion of wetland acreage on most sites on the Texas coast.

Response: See the response to the similar comment by Berg Oliver Associates (Aron Edwards) on page 6.

There are numerous other plants that need to have their wetland indicator status assigned or modified. For example, deep rooted sedge (*Cyperus entrerianus*) is now a well established invasive plant in the upper Texas coast that was not present in 1988. This plant is more frequently found on uplands than it is in wetlands. Chinese tallow (*Triadica sebiferum*) is still listed in the genus Sapium with indicator status of FACU in 1988 Region 6 list. The 1996 draft lists it in the genus Sapium and as FAC in Region 6. This tree if also more frequently found in uplands than in wetlands; indeed, it was originally introduced as an upland ornamental.

Response: Changes to the plant list are beyond the scope of the regional supplement. The Corps, NRCS, and EPA are currently working on a parallel effort to update the nomenclature, regions, and indicator assignments on the list.

By disregarding species that do not have an indicator status in the project region or adjacent regions, the true dominant species on the site may not be given sufficient emphasis. We recommend that the procedure of assuming species not listed on the wetland plant list to be UPL be continued unless it is clear that the site is a Problem Area.

Response: In general, the supplement does continue the practice of treating unlisted species as UPL. It is NI and NO species that should be disregarded or the indicator status given in the next nearest region should be used.

Page 16, Paragraph 1, General

It seems that if the dominance test determines that the community is non-hydrophytic, then that should be the final determination. By taking a stair-step approach, the new proposed methodology may result in a hydrophytic vegetation determination based on non-dominant species. It seems that the structure of these tests is created to ensure a hydrophytic determination by mandating continued testing until a hydrophytic determination is achieved. This is not science; it is a philosophical bias.

Response: The two hydrophytic vegetation indicators in the supplement have equal status. A community is hydrophytic if either one of them is met. As explained in the supplement, the stepwise procedure is designed to reduce effort in the field by applying only the less-demanding dominance test in the majority of wetland determinations. In fact, the supplement's two indicators are fewer than the six hydrophytic vegetation indicators given in the 1987 Manual.

Page 20, General
By including the Prevalence Index test, the sample plot may result in a hydrophytic vegetation determination based on the inclusion of non-dominant species. It is our recommendation that testing cease with the Dominance Test as outlined on page 17. The required additional testing appears to be means of capturing more areas as exhibiting hydrophytic vegetation than formerly specified in the USACE 1987 Manual.

Response: The dominance test and prevalence index produce the same conclusion in most cases. Hence, only the dominance test is needed in most situations. However, as stated above, use of the prevalence index is intended to fix a known problem with hydrophytic vegetation decisions that are based solely on dominants, which may not reflect the wetland affinities of the plant community as a whole.

Page 22, Introduction
Stating that a soil meeting the definition of a hydric soil is hydric whether or not it exhibits indicators can be misleading. Sometimes a soil that is listed hydric on a soil survey will not have hydric soil characteristics because it actually is not a hydric soil. This statement allows a delineator to assume soils to be hydric, even when there are no indicators and the soil is not a problem soil. This can change the boundaries of a wetland, or even allow the inclusion of an entire geographic area that may not currently be a wetland.

Response: This comment confuses the hydric soil definition with hydric soil lists. We agree that hydric soils should not be identified by using soil surveys and hydric soil lists. The supplement abandons this unreliable practice. Under the supplement, hydric soils are identified on the basis of indicators observed in the field. However, all hydric soils must meet the hydric soil definition, whether or not they exhibit indicators.

Page 25 Observation and Document the Site
We have had problems reviewing abandoned rice fields that have residual hydric soil indicators. The residual indicators were formed during the flooding of the fields for rice production, and local soil scientists believe that the current hydric indications in former rice fields are misleading.

Response: In these cases, it is appropriate to ask a soil scientist with local experience whether the indicators were caused solely by rice farming. Areas that have been used for rice cultivation are not necessarily wetlands.

Page 26
"Soil chroma should not be rounded ...." Clarification of chroma color between 2 and 3 is appreciated.

Response: No response is needed.

Page 27
Soil holes sampling "...concentrate their sampling efforts near the wetland edge and, if these soils are hydric, assume that soils in the interior of the wetland are also hydric even if they lack an indicator." This can be misused, especially in the shallow seasonal wetlands present on the upper Texas Coast, if you find only one location that has hydric soils indicators then all of the wetland has hydric soils. If the majority of the shallow depression does not have indicators, it just may mean the area does not have hydric soils.

Response: We will revise the wording. However, if the edges of a depression are hydric, it makes sense that the wetter, interior portions of the same depression are also hydric, even though they sometimes lack indicators.

Page 27and 42
"Nodules and concretions are not considered to be redox concentrations unless noted." The definition of nodules and concretions need be clarified.

Response: We will add a definition to the Glossary.

Page 57 Indicator F12: Iron-Manganese Masses
This indictor should be clarified so that it applies only on floodplains and is not to appropriate for use for other areas such as abandoned rice fields.

Response: The first two words of the Technical Description are "On floodplains…" The concept is repeated in the User Notes. No change is needed.

Page 59 Indicator F17: Delta Ochric
This indictor should be more clearly stated to be applicable only for accreting areas of the Mississippi River Delta.

Response: The wording of the indicator is taken directly from the NTCHS Field Indicators of Hydric Soils in the United States. It is not the intent of the Supplements to alter the Field Indicators. If you feel that errors exist in the Field Indicators, you should submit your concerns in writing to the National Technical Committee for Hydric Soils as outlined on pages 3 and 4 of the Field Indicators.

Page 60 Indicator F18: Reduced Vertic
This indictor requires that alpha, alpha-dipyridyl measurements be taken for at least 7 continuous days and for at least 28 cumulative days under normal rainfall conditions. This indicator should be regulated to the hydric soil indicators for problem soils section. Also, under user notes, indicators F4 and F5 should be updated to A11 (depleted below dark surface) and A12 (thick dark surface), respectively (per NRCS Field Indicators of Hydric Soils of the United States Version 6.0 page 18).

Response: We agree that this indicator will seldom be used due to its weather and timing restrictions. However, it is taken directly from the NTCHS Field Indicators of

Hydric Soils in the United States. It is not the intent or purpose of the Supplements to alter the Field Indicators. We will update the references to A11 and A12.

Page 66 Some wetland hydrology indicators may be present on non-wetland sites.
The 1987 Manual and the draft Supplement are remiss in not giving some indications as to how and how long to disregard false-positive wetland hydrology decisions. Both go to great length to review wetlands during normally dry or droughty times, but there are no statements as to how to delineate wetlands during or after an abnormally wet period other than "... one or more site visits should be scheduled to coincide with the normal wet portion of the growing season." The upper Texas coast growing season is year round. Most wetland delineations only allow a brief period for site visits to study costs and project schedules. The recommendation that several site visits should be scheduled over a longer time period to prove or disprove wetland hydrology is not economically, logistically, or operationally feasible.

Response: The supplement does not provide extensive guidance for dealing with "false-positive" wetland hydrology indicators because in the three-factor approach, involving indicators of hydrophytic vegetation, hydric soil, and wetland hydrology, areas that exhibit only one factor will not be mistaken for wetlands. In the majority of wetland determinations, repeat visits are not needed.

Page 74 Indicator B1: Water marks
Stronger cautions should be added in the user notes to ensure that false positives of this indicator are not used after above normal rainfall or recent flood events.

Response: The caution is stated in the introduction to the chapter on page 66 and in the User Notes. Furthermore, the three-factor approach, involving indicators of hydrophytic vegetation, hydric soil, and wetland hydrology, already ensures that areas that exhibit only one factor will not be mistaken for wetlands.

Page 75 Indicator B2: Sediment deposits
Stronger cautions should be added in the user notes to ensure that false positives of this indicator are not used after above normal rainfall or recent flood events.

Response: See the previous response.

Page 76 Indicator B3: Drift deposits
Stronger cautions should be added in the user notes to ensure that false positives of this indicator are not used after above normal rainfall or recent flood events.

Response: See the previous response.

Page 77 Indicator B4: Algal mat or crust
Stronger cautions should be added in the user notes to ensure that false positives of this indicator are not used after above normal rainfall or recent flood events. Also, better identification of this parameter is needed to ensure that it is not confused with algae that normally grows on soils (see algae in Figure 4-15 and Figure 31 on page 63 Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region December 2006).

Response: See the previous response. Furthermore, we are not aware of algae that grow on dry soils in this region.

Page 80 Indicator B7: Inundation visible on aerial imagery
This method should only be used for farm and pastureland following the procedure described by the USDA NRCS with 5 or more years of aerial photos.

Response: The reason for this suggestion is unclear. The working group believes that water standing on a field site is strong evidence for wetland hydrology whether it is observed directly during a site visit or indirectly in a photograph, as long as the normality of weather conditions prior to the observation is considered.

Page 81 Indicator B9: Water-stained leaves
Stronger cautions should be added in the user notes to ensure that false positives of this indicator are not used after above normal rainfall or recent flood events. The phase "contrast strongly" should have a stronger emphasis.

Response: The caution is stated in the introduction to the chapter on page 66 and in the User Notes. Furthermore, the three-factor approach, involving indicators of hydrophytic vegetation, hydric soil, and wetland hydrology, already ensures that areas that exhibit only one factor will not be mistaken for wetlands. The wording is already clear.

Page 84 Indicator B6: Surface soil cracks
This indicator should be removed because of the high probability of misuse, especially after above normal rainfall or recent flood events.

Response: See the previous response.

Page 85 Indicator B8: Sparsely vegetated concave surfaces
This indicator should be removed because of the high probability of misuse, especially after above normal rainfall or recent flood events.

Response: See the previous response.

Page 86 Indicator B10: Drainage patterns
This indicator should be removed because of the high probability of misuse, especially after above normal rainfall or recent flood events.

Response: See the previous response.

Page 87 Indicator B16: Moss trim lines
This indicator should be removed because of the high probability of misuse, especially after above normal rainfall or recent flood events.

Response: See the previous response.

Pages 88 through 95 Group C - Evidence of Recent Soil Saturation
We strongly disagree with using any of these indicators because of the high probability of misuse, especially after above normal rainfall or recent flood events. The soil indicators such as C1, C3, C4 and C6 should only be used for determining hydric soils and not wetland hydrology. Use of the draft supplement as is could significantly and, in our professional opinions, erroneously expand delineated wetland acreage on the Texas coast.

Response: See the previous responses. In addition, only one of these indicators (C1) is also used as a hydric soil indicator. The justification for this is given in the User Note on page 88. C1, C3, C4, and C6 all indicate current wet conditions and cannot be relict features (unlike most hydric soil indicators). Therefore, they are valid indicators of wetland hydrology.

Indicator C1: This indicator was previously addressed in the hydric soil section, and should be used as an indicator in only one of the two sections. If there is a presence of hydrogen sulfide in the soil, it is highly probable that the soil will be saturated at the time of sampling, therefore meeting the wetland hydrology criteria. If it is not saturated, it should be handled as a problem situation.

Response: See the previous response. In addition, if the soil is not saturated, then hydrogen sulfide odor would not be present. There would be no need to consider it a problem situation.

Indicator C2: Dry-season water table is not appropriate for the upper Texas coast because our hydrology is from the surface down and not from the water table up. After major rainfall events the upper section of the soil column can be saturated while the lower section is dry. Using this indicator is not appropriate for the Texas coastal region.

Response: In the case of a wetting front due to recent rainfall, there should be no confusion. The indicator would simply be absent. However, if water perches on a restrictive layer in the soil such that a water table is present, then this indicator might be relevant. If the water table in these situations never gets higher than 12 inches below the surface or does not persist long enough, then the three-factor approach, involving indicators of hydrophytic vegetation, hydric soil, and wetland hydrology, already ensures that these areas will not be mistaken for wetlands.

Indicator C3: Oxidized rhizospheres are a common occurrence on the Gulf Coast. It has been our experience that this indicator is present in both wetland and non-wetland areas. It is our strong recommendation that this indicator remain a secondary indicator of wetland hydrology.

Response: Given that oxidized rhizospheres are a response to saturated and anaerobic soil conditions, it is not clear why they would be common in nonwetlands in this region. However, the three-factor approach, involving indicators of hydrophytic vegetation, hydric soil, and wetland hydrology, already ensures that these areas will not be mistaken for wetlands.

Indicator C8: Crayfish burrows. In the upper Texas coast including on many Houston urban lawns that are covered with St. Augustine grass (*Stenotaphrum secundatum* - FAC+), crayfish burrows can be present and are clearly misleading wetland indicators. With the numerous species of crayfish that are not closely associated with wetlands or aquatic habitats, this indicator has high misuse factor and should not be used.

Response: Although most species of crayfish are shallow water and wetland specialists, the User Notes acknowledges that some species in the Southeast are not closely associated with wetlands. This indicator was assigned a secondary status in this region (requiring at least one additional secondary indicator of wetland hydrology) and the User Note restricts its use to areas that have indicators of hydrophytic vegetation and hydric

soils. We are interested in further observations and comments on this indicator during the interim use period for this supplement.

Indicator C9: Saturation visible on aerial imagery.
In the upper Texas coast, numerous fields have been laser leveled and the dark soil colors have persisted for many years. With the amount of rainfall, lack of slope, and persistent dark parent soil colors, this indicator has a high potential misuse factor even following the recommended multiple years of photography and onsite verification of saturation and should not be used.

Response: This indicator requires field verification of photo signatures, such as confirming that signatures correspond to "depressions or drainage patterns", "field verified hydric soils," etc. A laser-leveled field would have no depressions or drainage patterns and, thus, the indicator would not apply. It is not clear in the comment what is the cause of persistent dark colors and whether they would be related to hydric soil features in these disturbed soils. In any case, indicator C9 is secondary and would require at least one additional secondary indicator to conclude that wetland hydrology is present.

Page 97 Indicator D3: Shallow aquitard
Use of this indicator has so many qualifiers such as aquitard on the surface, local experience and professional judgment should indicate that perched water table is likely to occur makes the use of this indicator problematic and prone to misuse. Therefore it should not be included.

Response: The reminder that an aquitard can be at the surface is very relevant to the Texas coast with its extensive clay soils.

Page 98 Indicator D5: FAC-neutral test
On the upper Texas coast this indicator is not a good indicator for wetland hydrology and is prone to misuse.

Response: We don't understand the reason for this recommendation.

Page 99, Paragraph 1, Sentence 5
By stating that "some Problem Area wetlands may permanently lack certain indicators due to the nature of the soils or plant species on the site," it allows the delineator to assume one of the three wetland criteria. This is an unsound procedure for conducting wetland delineations. If one of the three wetland criteria is permanently missing and is not considered an atypical situation, then according to the USACE 1987 Manual definition, it is not a wetland.

Response: The statement is based on the 1987 Manual, which acknowledges in several places that certain wetlands may lack any of the currently recognized indicators for a given factor. For example, wetlands with the following soil conditions may lack hydric soil indicators: "dark (black) mineral soils" (1987 Manual, para. 44 f (2) note), "significant coloration due to the nature of the parent material (e.g., red soils…)" (para 44 f (2) caution), "recently deposited sandy material" (para. 45 caution), and others. The development of new indicators has improved these situations, but problems still exist. These are addressed in Chapter 5, where procedures are described to integrate information from various sources into a decision on the presence or absence of wetlands.

US Environmental Protection Agency (Sharon Fancy Parrish), Region 6, Dallas, TX, letter dated August 21, 2007

EPA has been a partner in the regionalization process from its inception and was represented with six members from four EPA regions on the Atlantic and Gulf Coastal Plain Working Group. EPA Region 6 provided additional written comments, as follows.

…Region 6 remains very concerned with the method that the Corps' is proposing to regionalize the 1987 manual with regional supplements. We understand the Corps' is publishing numerous regional, stand-alone supplements across the Land Resource Regions of the United States. As proposed, each supplement would supersede the 1987 manual for all (3) three wetland delineation factors: soils, hydrology, and vegetation. We continue to recommend that the effort be focused only on Section G, Problem Areas, of the 1987 Corps of Engineers Wetlands Delineation Manual. As proposed, within EPA Region 6, the Corps would publish (5) five stand-alone regional supplements. We are concerned that overlapping mandatory-use supplements would create confusion among public and private delineators. We recommend the Corps consider publishing one new supplement or an amendment to the 1987 manual for "problem wetland areas" within the contiguous United States with regional emphasis. We understand that Alaska and the Pacific Islands may require stand-alone supplements.

Response: EPA Region 6's suggestion that the supplement be limited to "problem wetland areas" and not address changes to wetland indicators was rejected by this working group and by all previous regional working groups because it would not result in significant "regionalization" or updating of the 1987 Manual. EPA Region 6 encompasses a vast and ecologically diverse area, ranging from the arid Chihuahuan Desert in New Mexico, through the southern Great Plains, to the coastal marshes and forested swamps of Louisiana. It is appropriate and essential to divide the area into wetland-delineation regions based on ecoregion concepts because wetland conditions are very different across EPA Region 6's area of interest. This is the basic purpose of regionalization and should cause minimal confusion among users.

If the Corps elects to proceed with these regional supplements as proposed, we recommend the Corps conduct coordinated comprehensive and targeted interagency field testing of the proposed supplements prior to release. This would entail interagency development of technical and statistical standards for testing protocol. Interagency teams should include states and other interested stakeholders.

Response: Draft regional supplements are subjected to interagency field testing using the protocol established by the National Advisory Team, an interagency group composed of Corps, EPA, USDA Natural Resources Conservation Service, and US Fish and Wildlife Service members. Field testing teams are organized at the local level and may include interested state and tribal representatives. Private consultants and others are also welcome to do their own field testing and submit the results to the Corps. The public notice provides data forms, the NAT testing protocol, and information about submitting results.

The interagency field testing effort should focus on standards for identified questions regarding application of proposed regional supplement indicators on specific regional wetland types.

Response: We do not understand this comment.

The Corps is proposing to issue these supplements on a one-year interim basis for mandatory regulatory use. We recommend that the Corps retain the 1987 manual as the default methodology for regulatory purposes during this one-year testing period. Further, we recommend side by side comparison of the supplements and the 1987 manual be conducted on all verified wetland delineations during this one-year interim testing period. The results should be assessed by the National Advisory Team and the regional workgroups and modifications made to the regional supplement prior to implementation.

Response: During the one-year interim implementation, Corps district regulatory offices will have the option, on a case-by-case basis, of using previous guidance under the 1987 Manual if any problems are detected in the regional supplement. Mandatory side-by-side comparisons of all wetland delineations would be an unnecessary added burden on permit applicants, consultants, and Corps regulators. ERDC will review all comments submitted during the interim period and, based on that review, will propose changes to the supplement and provide them to the regional working group for approval. The revised and approved regional supplement will be published as Version 2.0. In the future, proposals for changes to regional supplements should be submitted to the National Advisory Team for consideration and action.

In Chapter 3, Hydric Soil Indicators, All Soils, Sandy Soils, and Loamy and Clayey Soils, 2nd paragraph, it states that "Unless otherwise indicated, all mineral layers above any of the indicators, must have a dominant chroma of 2 or less, or the layer(s) with dominant chroma of more than 2 must be less than 6 inches (15cm) thick to meet any hydric soil indicator."

Response: That is correct.

We understand this requirement was written to insure that a continuous water table is present throughout the growing season.

Response: That is not correct. There is no requirement for a continuous water table throughout the growing season. Most hydric soils are only seasonally inundated or saturated.

In our field experience in the Coastal Plains Region, we have found that many wetlands have high infiltration rates or seasonal hydrology. As a result, the upper part of these hydric soils typically have dominant chromas that are 2+ but are reduced to below 2 within the upper 12 inch soil profile. We are concerned that this requirement mentioned above would create a whole new set of problem soils that do not presently exist under the 1987 wetland delineation manual. Therefore, we recommend that the above-mentioned requirement be deleted from any final Coastal Plains Regional Supplement.

Response: This comment should be addressed to the National Technical Committee for Hydric Soils (NTCHS), along with appropriate data showing that these soils meet the hydric soil technical standard. Generally, soils with the described characteristics are not hydric unless they meet an indicator. The NTCHS hydric soil indicators (Version 6.0, 2006, as amended) are a refinement of the first-generation hydric soil indicators originally published in the 1987 Manual. They are continually being updated and improved as new scientific information becomes available. Hydric soil indicators in the 1987 Manual are obsolete.

In Chapter 3, Hydric Soil Indicators, approximately 60% or 19 out of 32 NRCS indicators of hydric soils require redox features to start or completely occur within the upper 6 inches of the soil profile with minimum thicknesses. The 1995 National Academy of Sciences report stated that we should look for hydric soil indicators in the upper 1 foot of the soil profile. We recommend modifying the approximately 32 NRCS hydric soil indicators included in this draft supplement mentioned above to conform to the upper 12 inch soil profile requirement to be consistent with the 1995 National Academy of Sciences report.

Response: This comment should be addressed to the NTCHS. The Corps is committed to working with the NTCHS to make their hydric soil indicators as accurate as possible. EPA also has membership on the NTCHS. Only hydric soil indicators that have been approved by the NTCHS are included in regional supplements. The indicators in question are mostly for sandy soils, which have minimal, if any, capillary fringe above a water table. Therefore, these indicators require stronger evidence of a near-surface water table (i.e., evidence of anaerobiosis and reduction within 6 inches of the surface).

In Section 5, Difficult Wetland Situations in the Atlantic and Coastal Plains Region, Problematic Hydric Soils, Procedure #4e adds a condition that soils should be considered hydric if they are ponded or flooded, or the water table is less than or equal to 12 in. (30 cm) from the surface, for greater than or equal to 14 or more consecutive days during the growing season in most years (greater than or equal to 50 percent probability) using gauge data, water-table monitoring data, or repeated direct hydrologic observations.

The NRCS criteria for hydric soils in the 1987 manual states that the area must be saturated, flooded, or ponded for 7 consecutive days to be hydric. We recommend that the Atlantic and Coastal Plains regional supplement maintain 7 days as the hydric soils minimum standard to not reduce the boundary of wetlands that currently exist under the 1987 manual.

Response: In practice, the majority of hydric soil determinations are based on indicators that can be readily observed in the field, such as low-chroma colors, redoximorphic features, and accumulation of organic matter. Hydric soil determinations are rarely based on hydrologic data except in highly disturbed or problematic situations. Therefore, the change in hydrologic standards will not affect wetland boundaries for the vast majority of sites. In those situations where hydrologic data must be used to help determine wetland boundaries in the absence of indicators, the regional supplements use a default hydrologic standard based on the recommendations of a 1995 National Academy of Sciences (NAS) report (i.e., 14 or more consecutive days of flooding, ponding, or a water table within 12 inches of the surface during the growing season at 50% or higher frequency). Hydric soil criteria, which include the 7-day threshold for flooding or ponding described by EPA above, were developed in the early 1980s as a way to query the NRCS soils database for the purpose of generating lists of potential hydric soil series for the National Wetlands Inventory. Hydric soil criteria were never intended to be used to identify hydric soils in the field and have been superseded in the regional supplements by the 14-day standard recommended by the NAS.

In Section 4, Wetland Hydrology Indicators, Growing Season, based on several NRCS national and state soil temperature studies, we recommend the Corps adopt a year-round growing season for Land Resource Region T, Outer Coastal Plains, in Texas and Louisiana.

Response: We concur and will add wording that recognizes a year-round growing season along both the Atlantic and Gulf coasts in areas near the ocean. However, it is

not clear how far inland year-round growing seasons occur or how much year-to-year variability occurs.

In Section 5, Difficult Wetland Situations in the Atlantic and Gulf Coastal Plain, Wetlands that Periodically Lack Indicators of Wetland Hydrology, Procedure #3h. The U.S. Army Corps of Engineers 2005 Technical Standard for Wetland Hydrology requires greater than or equal to 14 consecutive days of flooding, ponding, or a water table less than or equal to 12 inches below the soil surface during the growing season at a minimum frequency of 5 years in 10. We recommend that the Atlantic and Coastal Plains regional supplement maintain greater than or equal to 7 days as the minimum standard for hydrology to not reduce the boundary of wetlands in the Atlantic and Coastal Plains region that currently exist under the 1987 manual.

Response: The premise of this comment is incorrect. Currently the wetland hydrology standard based on the 1987 Manual is 5% of the growing season, which in the coastal plain region ranges from about 10-18 days depending on growing season length. As stated in a previous response, the regional supplements use a default hydrologic standard based on the recommendations of a 1995 NAS report (i.e., 14 or more consecutive days of flooding, ponding, or a water table within 12 inches of the surface during the growing season at 50% or higher frequency). The Corps has two reasons for abandoning the old 5% threshold: (1) this threshold has no basis in the scientific literature and (2) the NAS has recommended a consistent 14-day standard unless an alternative standard has been developed based on scientific studies in a particular region or wetland type. No such alternatives have been developed for the coastal plain; therefore, the default 14-day standard was incorporated into the supplement.

In Section 5, Difficult Wetland Situations in the Atlantic and Gulf Coastal Plain, Problematic Hydric Soils, Soils with Faint or No Indicators, #3 Slightly to Strongly Alkaline Bottomland-Hardwood Vertisols in Texas. Based on recent interagency field testing, we recommend that this reference not be limited to clay soils in bottomland hardwood forests in Texas. Some hydric sandy and loamy soils in Land Resource Region T in Texas and Louisiana that saturate, pond, and reduce intermittently do not show identifiable redox features due to alkaline reactions. We recommend that #3 apply to all soils in Land Resource Region T in Texas and Louisiana.

Response: The "Slightly to Strongly Alkaline Bottomland-Hardwood Vertisols in Texas" problem soil guidance was based specifically on work published by Miller and Bragg (2007). We are not aware of any other studies that would extend this problematic soil type to sandy or loamy soils in the coastal plain. In fact, soil scientists on the working group were not aware of any other alkaline hydric-soil problems in the region. This question is worthy of additional study. Expanded guidance could be considered for inclusion in future versions of the supplement.

We recommend a workable process be established whereby the Atlantic and Coastal Plains Manual can be efficiently modified as new scientific information becomes available.

Response: The coastal plain supplement, although not giving details of a procedure, states that the interagency National Advisory Team (NAT) shall have the responsibility to receive and consider any proposals for changes to the indicators and procedures given in the supplement. The NAT, in turn, will make recommendations to Headquarters, U.S. Army Corps of Engineers. Currently, EPA has two representatives on this interagency team.

Wetland Science Applications, Inc. (Robert J. Pierce) letter dated 4 September 2007:

1. General: The supplements that have been drafted so far are more similar than dissimilar. The largest difference between regions is in the soils, which essentially uses (and defensibly only would use) the regional indicators for soils that NRCS has developed. Rather than having states with three or four different supplements that may apply, the COE should go through an Administrative Procedures Act (APA) revision of the 1987 Manual and simply produce one document that incorporates by reference the latest regional soils indicators and contains the other minor differences (that are legitimate) within a unified document.

Response: All eight regional working groups convened to date have disagreed with this suggestion.

The new manual should contain the procedure for doing a complete delineation including non-wetland waters of the U. S.

Response: We disagree. The 1987 Manual addresses only wetlands. Therefore, this supplement only provides wetland indicators.

2. The formulation of the Draft in general and the "Difficult Wetlands" Section in particular is ill conceived. The foundation of the 1987 Manual is the requirement for three independently derived confirmations that a landscape feature is sufficiently wet before it is determined to be a wetland and thus, regulated by the federal government, Independence has been lost in the Draft. More importantly, the Draft never actually indicates that the user can ever confidently determine that a landscape feature is NOT a wetland … .

Response: We disagree. The basic three-factor approach described in the 1987 Manual is not changed by the supplement. By default, an area is non-wetland unless it meets requirements described in the 1987 Manual and the supplement. Therefore, there is no need for procedures to identify non-wetlands.

3. p. 1. The Draft cannot help but change boundaries if implemented as written. While no one really cares about the "+" or "-,' for the FACW or FACU species, deleting the minus on FAC vegetation indicators will immediately affect large areas. As a member of the National Plant List Panel and the NE Panel back in the 80s, I know that plants that were rated FAC- where not considered hydrophytic by some members of the panels and were given the "-" designation so that they would not be considered such in the application of the 1987 Manual. The “FAC-“ designation was not reached lightly … .

Response: For a general discussion of reasons for dropping +/− modifiers on wetland indicator status ratings, see the response to the similar comment made by Berg Oliver Associates (Aron Edwards) above.

2. p. 1 There has always been a disconnect between the definition of "wetlands" and the use of the plant list. FAC plants cannot be said to be adapted for life in saturated soils - they are adapted to live in mesic conditions whether saturated or not.

Response: This comment reflects a fundamental misunderstanding of the "wetland indicator status" ratings given to plant species on the plant list. These ratings reflect the probability of occurrence of a species in wetlands in a region. A FAC rating does not mean the plant is adapted to mesic conditions. Rather, it has a 34 to 66 percent probability of occurrence in wetlands.

[The] FAC-neutral [test] is a much more technically defensible metric [for hydrophytic vegetation].

Response: It is known that the FAC-neutral test fails to identify many hydrophytic plant communities. This is one reason why it was dropped as an optional hydrophytic vegetation indicator in a 1992 guidance memo from Corps Headquarters. No regional working group has suggested that it be used as part of the hydrophytic vegetation decision.

3. Adopting the Prevalence Index with a 3.0 break perpetuates this insensitivity and is inconsistent with Wentworth, et al. (1988) and Wakeley and Lichvar (1997) – especially since the supplement drops the minus on FAC species. No data results are referenced in the supplement supporting that 3.0 is the appropriate threshold for hydrophytic versus mesic vegetation. To the contrary the only referenced documents addressing indicate that there are problems with the weighted average approach when the Index value is between 2.5 and 3.5 and that strong indications of hydric soils and wetland hydrology are necessary. It is especially inappropriate to rely on a 3.0 prevalence index break when either soils or hydrology are questionable (Wentworth, et al. 1988, Wakeley and Lichvar 1997). I do not believe that adopting this process with a 3.0 break will withstand a Data Quality Act (DQA) or legal challenge, especially not as used when either soils or hydrology are "problematic."

Response: It is true that Wentworth et al. (1988) suggested that plant communities with prevalence index values up to 3.5 may be hydrophytic. The supplements use the 3.0 threshold in line with more recent experience by NRCS and others. Plus or minus (+/-) modifiers on indicator status ratings are not used in the calculation of a prevalence index; the supplement does not change this fact. Wakeley and Lichvar (1997) showed that the prevalence index is generally a more conservative measure of hydrophytic vegetation than the dominance test.

4. p. 2. The existence of a National Advisory Team to review rigorously developed data means that this supplement should be based upon rigorously developed data. None are referenced in support of the changes made. Where are these data?

Response: Regional supplements reflect the state-of-the-science in wetland identification and delineation. They incorporate new scientific studies, expert opinion, and twenty years of accumulated experience with wetland delineation since the 1987 Manual was published.

I do not believe that this supplement would withstand a DQA challenge. …

Response: This is not a technical comment. No response is needed.

The hydrology "standard" is very different from the hydrology requirement of the 1987 Manual. Furthermore, it is an absurdity to say that a "standard" is secondary to field indicators. Standards

need to be primary and directly related to the primary regulation that they are intended to support - in this case the Clean WATER Act (CWA). …

Response: We disagree. The purpose and use of the hydrology technical standard are clearly described in the supplement. Furthermore, the 1987 Manual does not give a standard that is adequate for evaluating groundwater monitoring data.

Water no closer to the surface than 12 inches below it does not constitute navigable waters within the context of the CWA. It is strictly ground water and as such should be regulated by the Safe Drinking Water Act. …

Response: This is not a technical comment. Issues of policy have been considered by Corps Headquarters.

Finally, the "standard" is not technically defensible.

Response: The standard is based on National Academy of Sciences recommendations. Such recommendations are considered authoritative by the Federal government.

5. If you are going to use all of the MLRAs they should be depicted on Figure 1.

Response: MLRA maps are provided with the applicable indicators.

7. p. 9, last para. The formulation of this paragraph suggests, that many landscape features that will NOT qualify as wetlands are wetlands. It suggests that floodplains and riparian ecosystems, natural levees and bottomland hardwood forests are wetlands. While it is unlikely that the levees are ever wetlands, but only some of the others will qualify as wetlands. One of the major problems with the HGM literature is that the authors often include these broad categories of landscape features as wetlands even though many of them will not have the duration or frequency of hydrology necessary to constitute 404 wetlands. This para. either is an intentional effort to expand what constitutes 404 wetlands or it is an inadvertent slip into the functional assessment concept of wetlands.

Response: The sentence describes "alluvial landforms" and does not imply that any of them are necessarily wetlands.

8. p. 11, para. 1, last sentence. This sentence is contrary to the 404 definition of wetlands and mischaracterizes what is being identified by the Draft as wetland hydrology. The definition calls for species "typically adapted for life in saturated soils" - not "tolerate" inundation or saturation. To characterize a water table at 12 inches for 14 days every other year as "prolonged" saturation is ludicrous - especially when the water table meets these conditions only at the end of winter/beginning of spring when plant metabolism is low. Many species will not be growing early in the spring and are not stressed. Many species will have more than 50% of their roots (if not essentially all of their roots) above the water table at 12 inches and are not stressed.

Response: The sentence in question accurately reflects the 1987 Manual's concept of a hydrophytic plant community in context with the rest of the paragraph.

9. p. 11, 3rd para, penultimate sentence. As in comment 7, floodplains are identified as wetlands.

Response: The sentence discusses the effects of fire on plant communities. It does not say that floodplains are wetlands.

10. p. 11, last para, last full sentence. Such shifts can occur in non-wetlands as well. This sentence simply adds another level of confusion to the process. Where are the citations for this phenomenon and specifically what types of wetlands are referred to? A condition with FACU and UPL species is likely to be found on drained hydric soils. The fact is that these plant communities may not be wetlands.

Response: The sentence is clear. We agree that species shifts occur in nonwetlands as well, but they are irrelevant to the task of identifying wetlands.

11. p. 12 1st full para., penultimate sentence. This concept is taken straight from the 1989 Manual. While such situations do exist, they are very limited on the landscape and need to be specifically identified here - not simply leaving an open-ended concept.

Response: The sentence is accurate.

12. p. 13, 2nd para, 2nd sentence. Use of the term significant is inappropriate and misleading unless you are referring to statistics or the concept of "significant nexus."

Response: We will use a different term.

13. p. 13, 2nd para, penultimate sentence. Referring to use of a BAF prism is nonsense and should be deleted. It was salvaged from the 1989 Manual. As the Draft points out it can't be used for PI. Furthermore, I have never seen a delineation submitted for a JD that has used it. Have you? Is the statement that basal area can not be used in a PI, technically supported anywhere.

Response: The option to use a prism to estimate basal area of tree species in a wetland delineation was originally developed by the Environmental Protection Agency in their 1988 "Wetland Identification and Delineation Manual." The Coastal Plain working group wanted the option of using a prism to sample trees because it is rapid and efficient. It is true that the data could only be used in the dominance test and not in the prevalence index.

14. p. 13, last para. The PI as developed by NRCS used frequency data. Where are the technical data confirming that a PI using absolute cover is valid?

Response: Quadrat sampling and point-intercept (frequency) sampling are alternative ways to estimate vegetation cover (e.g., Mueller-Dombois and Ellenberg, 1974, Aims and Methods of Vegetation Ecology, Wiley, New York; Bonham, 1989, Measurements for Terrestrial Vegetation, Wiley, New York).

15. p. 14 list of strata. This is brand new. It is not consistent with the 1987 Manual, the 1989 Manual or with common practice. The Draft provides no technical support that the old processes caused any problem, or any data that these new strata are technically better. Why raise the subjectivity of deciding whether *Cornus florida,* for example, is a small tree or a shrub. This is needless change for change's sake.

Response: Studies have shown that the details of strata and sampling design make little difference to the outcome of a hydrophytic vegetation determination. Therefore, working

groups have adapted the 1987 Manual's sampling design to reflect regional differences in vegetation structure and local experience with vegetation sampling.

16. p. 15, last para. See Comment 3 on the inappropriateness of making FAC-species FAC. If you are dropping the "+" and "-" then ALL FAC- species should become FACU, because they have always been treated as functional equivalents (that is not hydrophytic vegetation) for purposes of the 1987 Manual. Penultimate sentence: the wording of this makes the process wide open to subjective abuse.

Response: Dropping of +/- modifiers in the dominance test does not change the fact that FAC- plants are in the FAC category; that is, their probability of occurrence in wetlands is in the range of 34-66 percent. They are not FACU, which are species present in wetlands 1-33% of occurrences. If there are data to suggest that any species in the FAC category has been mis-classified and belongs in the FACU category, then this information will be considered during future updates to the plant list. However, that process is independent of the supplements.

17. p. 16, 1st para, 2nd sentence. Not only "most wetlands" but also most non-wetlands in the coastal plain will pass the dominance test. That is why the dominance test is worthless and should be replaced by the FAC-neutral test. 3rd sentence. The converse is equally true. It is very common in the coastal plain for the dominants to be FAC. Examination of the non-dominants often reveals that the plant community is not hydrophytic. This entire paragraph shows a bias towards calling areas wetlands that are not.

Response: We disagree. See previous responses.

18. p. 16, 1 .b. "and/or" another example of never reaching a conclusion. The landscape can fail the plant dominance test and hydrology and still be considered a wetland because it is "problematic."

Response: The 1987 Manual recognizes that some unusual wetland communities may sometimes lack indicators of hydrophytic vegetation. The supplement does not change that fact, but it does provide more objective procedures for making a decision in those cases (see Chapter 5).

19. p. 20. Using a break point of PI 3.0 or less is not supported by any technical data provided and is not consistent with Wentworth, et al. It is especially inappropriate for problematic situations where it is most likely to be used. I do not believe that using a breakpoint of 3.0 will withstand a DQA or legal challenge.

Response: See previous responses to this comment.

20. p. 26. 2nd para under "Observe.. ." As written, people may be digging a lot of deep holes when unnecessary. "Often need to be greater than 20 in.. . ." My experience with coastal plain soils is that it is rare that you need to dig deeper than 20" - not often. What is the source of the data supporting "often?" This deep-hole discussion should be limited to areas where both wetland vegetation and hydrology have been confirmed. The example of A12 is not intuitively obvious. Nothing in A12 indicates digging to below a meter, which I assume the Draft indicates because Mollisols may have a meter-thick A horizon.

Response: We will revise this paragraph to clarify that soils with deep, dark surface layers may need to be examined below 20 inches depth to see if they meet the requirements for indicator A12. Other soils should be sampled to 20 inches or less.

21. p. 26. 3rd para under "Observe.. ." If the Draft is going to suggest photographs of soils, then it should suggest that a neutral-gray card be inserted into the photo so that color can be adjusted correctly. It is possible to make an image of soil either hydric or nonhydric depending upon filters used during printing.

Response: Hydric soil decisions are based on an accurate soil profile description, not a photograph. But photographs can support a soil profile description by helping a reader or reviewer to visualize soil characteristics. No changes are needed.

22. p. 27, la full para. Give the source of the data supporting the statement about the wettest interior lacking indicators and the frequency of occurrence on the landscape.

Response: This paragraph is a paraphrasing of one in the introduction to the NTCHS Field Indicators of Hydric Soils in the United States.

23. p. 27-64. It does not appear that the latest version of *Field Indicators of Hydric Soils in the United States* was used in the Draft. They should be. In fact, all of the regional supplements should use the latest NRCS Field Indicators and not adopt ones unless they are officially approved. To do otherwise, especially based upon the lack of supporting data is arbitrary and capricious and not consistent with good technical practice. In this regard it is inappropriate to adopt Indicator TF2 since it has not been sufficiently tested to convince the NTCHS that it is correct.

Response: We will update the draft supplement to correspond to the latest version of the NTCHS Field Indicators. The supplement allows the use of TF2 in problem situations if other supporting evidence is present (appropriate landscape position, vegetation and hydrology indicators).

24. p. 66, 1st para. NRC (1995) actually stated "provide strong evidence" not "the strongest evidence."

Response: We will make the recommended change.

25. p. 67, 1st para. The "technical standard" is fundamentally flawed as discussed above.

Response: See previous responses to this comment.

26. p. 67, 3rd full para. Use of 32° F in the south is appropriate.

Response: The working group and most reviewers disagree.

27. p. 67, last para. The long-term average should never be used when actual hydrology data are collected. You need to determine independently the beginning of the growing season because of the potential large annual variability. WETS table data are not sufficient.

Response: We will revise this section to clarify that direct observation of plant activity or soil temperature are the preferred methods for determining growoing

28. p. 68, 1. The two-plant requirement should be based upon dominants and preferably native species.

Response: The two-plant requirement was recommended by the National Advisory Team and adopted in the supplements to avoid unnecessary confusion and inconsistency between regions. Restricting the concept to native species would cause confusion over the status of various introduced and invasive species in natural plant communities. We hope to receive further comments on this procedure during the "interim" implementation period for this supplement.

29. p. 68, 1. f. If the emergence or opening of flowers occurs before green leaves are present it is not the start of the growing season. Growth in plants is the increase in mass or storage of high caloric molecules (lipids). It can only occur through photosynthesis. Plants that flower before leaf out are alive but are not growing. They are actually using energy stored during the last growing season -just as they survive the winter on the same energy. During the fall such plants produce a primordial flower bud, which over-winters and opens based upon a combination of genetics and climate. Red maples in Maryland may blossom during the end of January, long before the start of the growing season. Peaches in Georgia, etc. may blossom and be destroyed by frost. Although fruit may not set that year, it is only if a hard frost hits after the plant leaves have swelled and burst that the plant itself is in jeopardy. Indictors "a"-"e" are good; "f" should be dropped as technically inappropriate. The end of the growing season should be based upon the period when the majority of leaves have changed color - not when leaves fall. There is no more growth once chlorophyll has been degraded - only energy storage from leaves to roots.

Response: See the previous comment. In addition, this procedure is under review by the National Technical Committee for Wetland Vegetation.

30. p. 68, 2. There is no technical support provided for changing the depth of temperature analyses from 50 cm as determined by NRCS and the 1987 Manual to 30 cm. The change is arbitrary and capricious and I do not think that it would survive a DQA or legal challenge.

Response: The soil layer within 12 inches of the surface is the zone of interest for wetland identification. The recommended depth for soil temperature measurements was changed for consistency with that concept, although we know that temperatures are more variable at that depth than at 20 inches.

31. p. 68, last para. many of the C and D Group indicators are directly contrary to both the 1987 Manual and the October 7, 1991 and March 6, 1992 guidance documents.

Response: The supplement will update and replace previous guidance.

32. p. 72, A2. There should be a strong caution of "water seeping into the pit" after rainfall events not necessarily representing wetland hydrology. There are many systems where the "water table" will remain in the top 12 inches or puddle on the surface during the non-growing season and be totally lost almost immediately upon leaf-out. These are not wetlands but this language makes it easy to call them such.

Response: The cautions are already adequate.

33. p. 74, B1. Why does the highest watermark necessarily represent the most recent event? Do you have data supporting this? Present it.

Response: The phrase in question was a direct quote from the 1987 Manual. However, we will revise the wording to avoid misinterpretation.

34. p. 76, B3. Debris "widely distributed within the dewatered area" is not a good indicator. There is often debris widely distributed in stream corridors that is unrelated to water deposition in areas that may not be wetted from the floodwaters. Basically, this indicator as written states that any debris, can constitute a hydrology indicator.

Response: The indicator refers to "rafted" debris only. We don't understand how rafted debris can be unrelated to water deposition.

35. p. 79, B5. I believe that the film or sheen on the water surface is a biofilm produced by iron-oxidizing bacteria and not actually oxidized iron. The orange flocculent under the sheen on the sediment is oxidized iron mixed with bacteria and organic compounds.

Response: Your explanation of the phenomenon does not invalidate the indicator.

36. p. 80, B7. This should not be a primary indicator - especially if it is based only upon one aerial photograph. This should not be a secondary indicator either - only supporting information. Surface water during the non-growing season can be easily misinterpreted and is a seductive indicator for those anxious to find wetlands.

Response: The working group concluded that the observation of standing water in an aerial photograph should be given the same weight as standing water seen during a site visit. In both cases, one needs to consider prior weather conditions and the likelihood of occurrence during the growing season.

37. p. 81, B9. Water-stained leaves should not be a primary indicator. They can form very quickly entirely during the non-growing season and may indicate non-growing season puddling - not wetland hydrology. Where are the data supporting this as primary indicator?

Response: The working group disagrees. Experience with this indicator since 1992 suggests that the Primary designation is appropriate in this region.

38. p. 84, B6. This should not be a secondary or primary indicator - only supporting information. The fine-grained sediment might be deposited from very short-duration events, over a long period of time or on extraordinary event in the distant past. There is no way to know if the deposit is recent.

Response: Adequate cautions are given in the User Notes. Surface cracks are reliable evidence of a recent episode of inundation. As a secondary indicator, at least one more secondary indicator is needed to conclude that wetland hydrology is present, and further evidence of hydrophytic vegetation and hydric soil are needed to conclude that the area is a wetland.

39. p. 85, B8. By definition, a wetland is vegetated. The Draft specifies 5% cover of vegetation necessary. How can an area that is unvegetated be a wetland? This should not be a secondary or primary indicator - only supporting information. Furthermore, where are the technical data

supporting that the lack of vegetation indicates long duration inundation? My experience is that many areas lacking vegetation are usually ones with very flashy surface hydrology. Thus, neither wetland or non-wetland vegetation can become established because of frequent, short-duration puddling. Such landscape features by definition in the 1987 Manual are non-wetlands.

Response: The indicator refers only to the "ground surface" being potentially unvegetated. An overstory of shrubs or trees may be present, as in the photo. The reviewer is correct that completely unvegetated areas are not wetlands by the 1987 Manual.

40. p. 86, B10. This indicator shouldn't be limited to flow patterns - that is flowing water. A depression by it very nature is a drainage pattern.

Response: The indicator follows the 1987 Manual, which describes surface evidence of drainage flow. The indicator is not usually applied to depressions.

41. p. 87, B16. Get rid of this. This should not be a secondary or primary indicator – only supporting information. The draft doesn't specify which mosses count and which don't, when the result is from an infrequent event as opposed to a frequent one of long duration. The results were from Florida and there are no data presented as to the reliability anywhere else. It doesn't account for ice-rings causing such lines during the non-growing season in the north.

Response: The working group disagrees. The example picture of a moss trim line was taken in Mississippi in an area that floods regularly.

42. p. 88. This should not be a primary hydrology indicator. Based upon the chemistry of H2S, it cannot exist in the presence of oxygen. Therefore, anytime the H2S is present, the soils actually have to be saturated. A lot of people mistake other odors for hydrogen sulfide. It may be difficult to determine whether the odor is from above the 12-inch break or below it. Finally, 12-inches is not a valid break point.

Response: We disagree that the indicator should not be Primary. It is strong evidence for current soil saturation and would support wetland hydrology indicators A2 or A3. Although not essential for Primary status, the presence of hydrogen sulfide also indicates that the soil has been saturated long enough to become highly reduced.

43. p. 89. C3. This should not be a primary indicator or a secondary indicator – only supporting information. There is too much we don't know about it. Where are the technical data supporting it as a primary indicator along the entire Atlantic and Gulf coast? There have been documented instances of these forming in non-wet, pastures and feedlots rich in N compounds. They can form very rapidly in saline soils, which are likely to exist in the coastal plain and not be indicative of long duration hydrology. They are often misidentified as discussed in the Draft as well as by roots growing through redox concentrations that are not pore-linings.

Response: The working group believes that the cautions given in the User Notes are adequate for reliable application of this indicator. However, in the event of an error, the three-factor approach, involving indicators of hydrophytic vegetation, hydric soil, and wetland hydrology, ensures that areas with indicators of only one or two factors will not be mistaken for wetlands.

44. p. 90, C4. Alpha, alpha-dipyridyl can give false positive readings in direct sunlight.

Response: This is not a significant problem in the few seconds it generally takes for the chemical to react to the presence of ferrous iron.

45. p. 91, C6. This should not be a primary or secondary - only supporting information. Where are the technical data supporting this as a hydrology indicator? How do you tell if the soil has been tilled in the last two years? How do you know if your are looking at fleshly-formed, redox concentrations or relict features that have not been destroyed? There are too many uncertainties regarding soil-forming features to use this as a primary indicator. The presence of redox features alone is not even adequate to demonstrate Aquic conditions for soils (Vepraskas 1995) let alone use it as a hydrology indicator.

Response: We disagree. Recently formed iron concentrations indicate saturation and anaerobiosis since the last cultivation. Ask the land owner if cultivation was within the last two years. The cautions given for using the indicator are adequate.

46. p. 92, C7. This should not be a secondary or primary indicator - only supporting information. Where are the technical data supporting this indicator along the entire Atlantic and Gulf Coasts? How do you know whether the organic layer had been thick but has been oxidizing and is now 1-inch thick after being dewatered?

Response: Thin muck surfaces only exist in very wet environments in this region.

47. p. 93, C2. This should not be a secondary or primary indicator - only supporting information. The user needs to be cautioned about natural subirrigation.

Response: Natural "subirrigation" is not an issue. Areas where the water table is maintained at a level below 12 inches year-round will not exhibit indicators of hydrophytic vegetation and hydric soil and, thus, would not be mistaken for wetlands.

48. p. 94, C8. This is acceptable as a secondary indicator, however, the caution on vegetation should be strong, i.e., the vegetation should be dominated by FACW and OBL plants primarily. Much of the coastal plain will have FAC vegetation especially if FAC- plants become FAC. Crayfish can burrow to 3 meters or deeper (Pennack 1978. Freshwater Invertebrates of the U. S.)

Response: The indicator is Secondary and, therefore, requires at least one additional Secondary indicator to conclude that wetland hydrology is present. More stringent vegetation requirements are not needed and would be confusing. According to Pennack and other authors, crayfish can dig to great depths to follow a falling water table. However, the water table is generally at or near the surface when the burrowing begins. Therefore, the location of a crayfish burrow, even during the dry season, indicates that the water table was near the surface in that area when the burrow was established.

49. p. 95, C9. This should not be a secondary or primary indicator - only supporting information. You cannot see soil saturation on an aerial photograph - only darker soils that may or may not be saturated. Moist soils have a lower value than dry soils. It is too easily confused, and most practitioners will not bother to field verify. Simply verifying the presence of hydric soils with a photograph that has darker signatures where the hydric soils exist, says nothing about whether actual saturation is present or not. The wording of the last sentence of this indicator is very telling. It equates the presence of hydric soils with seasonal high water table even though there is

no necessity that the presence of such soil indicators is determinant of contemporaneous wetland hydrology.

Response: It is clearly stated that verification of photo signatures in the field is required to use this indicator. As a Secondary indicator, at least one additional Secondary indicator is required to conclude that wetland hydrology is present.

50. p. 96, D2. This should not be a secondary or primary indicator - only supporting information.
Response: The working group disagrees. Landscape position has always been the unstated "fourth parameter" of wetland delineation under the 1987 Manual. This has been stressed in wetland-delineation training courses since the 1980s. This indicator simply formalizes this concept by making landscape position a Secondary indicator of wetland hydrology in regions where it is appropriate.

5 1. p. 97, D3. This should not be a secondary or primary indicator - only supporting information.

Response: The working group has concluded that this is a reliable Secondary indicator in the coastal plain region.

52. p. 98, D5. This should not be a secondary or primary indicator - only supporting information.

Response: The FAC-neutral test has been used successfully as a Secondary indicator of wetland hydrology since 1992. The supplement simply continues this practice.

53. After producing a litany of hydrology indicators, many of which are totally unsupported by technical data, there is still no acknowledgement of negative indicators - indicators, which demonstrate a lack of wetland hydrology. …

Response: As stated in a previous response, the default conclusion under the 1987 Manual and this supplement is that a site is non-wetland. Therefore, there is no need to list indicators of non-wetland status. The Manual requires at least three different lines of documented evidence to conclude that the site is wetland.

54. Chapter 5. As discussed at the beginning of these comments, the entire premise for this section is fatally flawed. It needs to be totally rewritten with the exclusion of all the speculative and unsubstantial language that is present in it. The fundamental premise should be when the indicators for one "parameter" are weak, the indicators for the other two need to be stronger. When in doubt, the benefit should be given to the property owner, not the federal government. If it is not clearly a "water," it should not be labeled as one by application of tenuous, speculative, insubstantial, or technically unsupported indicators. Break out the data for all of this. The public is entitled under the DQA to know what this is based on.

Response: See the previous detailed responses to these comments.