PUBLIC COMMENTS AND RESPONSES

The following comments on the draft Interim Northcentral and Northeast 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 July of 2008. Responses to each comment are given in italic Arial font and were developed by the U.S. Army Engineer Research and Development Center (ERDC) with help from the Northcentral and Northeast regional working group. Readers of these comments and responses should also review the report of the independent peer-review team for additional details on many of the same topics. The Corps of Engineers thanks all those who provided comments on the supplement.

Indiana Department of Transportation (Nathan Saxe) letter dated 18 Sept 2008

Regarding the map on Pg. 4
It is difficult to determine whether the Central Great Lakes Forests are under the Northcentral or the Northeast Region or whether those two are one unit.

Response: This supplement is applicable across the entire "Northcentral and Northeast Region." "Northcentral" and "Northeast" are not separate regions.

Regarding the omission of +/- of the indicator status of vegetation
By not using the +/- aren't you increasing significantly what is called wetland by vegetative type?

Response: Field testing of regional supplements across the country has shown that this is not a significant concern. On 229 sites sampled to date across the country, only four had higher wetland boundaries due to changes in the treatment of FAC- plants (including zero of 35 sites in the Northcentral & Northeast region). Furthermore, the national panel for the wetland plant list recently concluded that "+" and "-" modifiers could not be supported with scientific data and would be dropped from future versions of the plant list. All FAC- plants are being re-evaluated by national and regional plant panels, and will eventually be assigned a FAC, FACU, or some other status.

Regarding Guidance on Vegetation Sampling and Analysis
The statement is made in paragraph two that "Near the wetland boundary, it may be necessary to adjust plot size or shape to avoid overlapping the boundary and extending into an adjacent community having different vegetation, soils, or hydrologic conditions." Perhaps this should be reworded to state that near the vegetated community boundary rather then wetland boundary since the boundary of the wetland will not be entirely known at this point because the delineation has not been completed.

Response: We will revise the wording. This topic is addressed further on page 14 of the draft where it says that "… plot sizes and shapes should be adjusted to fit completely within the vegetation patch or zone."

Regarding Seasonal Considerations and Cautions
This section differs from the Midwest version which essentially states that delineation should be conducted during the growing season. It is understandable that there are variations of climate

between two regions but this does not seem to state clearly when delineations should be conducted. The way this section is worded lends to subjectivity and haggling with consultants during the report review process.

Response: Neither this supplement nor the Midwest supplement states that wetland delineations should only be conducted during the growing season. The Corps of Engineers must make timely decisions on permit applications and often must make wetland determinations under less-than-optimal conditions. These sections provide options when environmental conditions are poor but they are not intended to restrict wetland determinations to any particular time of year.

Regarding Hydric Soil Indicators

In paragraph two of the Introduction it is stated that, "a soil that meets the definition of hydric soil is hydric whether or not it exhibits indicators." This section does not seem to indicate whether the fact that a particular soil occurs in the Soil Survey as a hydric soil is enough to indicate that the definition of hydric soils applies to a particular site or if the definition is strictly that which was determined by the National Technical Committee for Hydric Soils. If the Soil Surveys are not to be used in defining a soil hydric, then may include some language to that effect in this section.

Response: The proper use of soil survey information is addressed on pages 31-32 of the draft supplement. In general, soil maps and hydric soils lists are NOT sufficient to conclude that the soil on a particular site is hydric. Hydric soil determinations should be based on indicators observed in the field. The identification of hydric soils that lack indicators is addressed in Chapter 5.

Regarding Hydrology Indicators

Several of the Hydrology Indicators included in this supplement, both primary and secondary, should not be used as absolute decision makers. Granted, they are all important to consider in the evaluation of wetland hydrology, but not all of them act independently as indicators that hydrology is present of the sufficient duration and intensity to be considered wetland hydrology. Using these indicators as a means to make a decision based on the presence of one of these, or two of those does not seem a very scientific means of making the decision that wetland hydrology is present. Many of them are important to consider, but in the context of recent climatic events and in context with the surrounding landscape. Overall, it is felt that by elevating many of these items to Primary and Secondary indicators of wetland hydrology, the Corps of Engineers is vastly expanding its interpretation of what is a wetland and there seems to be a very conservative plan to include a lot of additional areas as wetlands just by indicators and not by field identification of site specific items.

Response: This comment bears on the role of wetland hydrology indicators in the three-factor approach, which has been discussed in every regional working group including the Northcentral/Northeast. 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 endorsed by the National Academy of Sciences in 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 Northcentral and Northeast regional 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. Therefore, the 3 factors are designed to work together to identify wetlands. They do not have the same roles or reflect the same things. Only long-term hydrologic monitoring can provide more reliable information about the hydrology of a site, and this is impractical under most circumstances. The regional supplement introduces a number of new wetland hydrology indicators, drops one previous indicator, and reassigns the category (Primary or Secondary) of a number of others. Field testing has indicated that, when used as part of a three-factor wetland determination, these changes do not affect wetland jurisdiction significantly. The Corps of Engineers would appreciate any further comments on this issue based on actual field experience during the one-year interim implementation period for this regional supplement.

1. Group B, Indicators B1, B2, and B3 all indicate to "use caution with water marks that may have been caused by extreme, infrequent, or very brief flooding events, or by flooding that occurred outside the growing season." These types of indicators only seem to be able to be verified by documenting microclimate, climate, rain and stream gauge data within the region. However, this data is frequently not available adjacent to the potential wetland site and thus seems to not be a reliable "primary" indicator of recent, sufficient, inundation/saturation during the growing season. It seems as though if you can't verify the timing or frequency of the inundation from the indicator itself, you can't verify that sufficient hydrology exists for wetlands. Indicators such as these should not even be secondary indicators unless accompanied by documentation verifying the frequency or timing of the inundation. I know of multiple instances where these indicators have been used to confirm hydrology in places where discrete hydrologic events occurred.

Response: See the previous response. In accordance with the caution given in the User Notes, these indicators may be discounted if they were known to be produced by unusual or infrequent hydrologic events.

2. B-1 and B-16 Water Marks and Moss lines-These occur in some uplands after rainfall and remain in non-wetland trees for extended periods of time.

Response: As discussed in the introduction to Chapter 4 and in User Notes, a number of wetland hydrology indicators may occur in uplands after unusually heavy rainfall events, extended periods of abnormally high precipitation, unusually high tides or river stages, etc. However, the three-factor approach, involving indicators of hydric soil and hydrophytic vegetation as well as wetland hydrology, ensures that these areas will not be mistaken for wetlands.

3. B-2 Sediment deposits- These occur as a result of rainfall in non wetland areas as well as rain with high winds.

Response: See the previous response.

4. B-3 Drift deposits- These indicate the presence of water (flood water-maximum) but not the duration of water standing. We also have wind/water drift lines forming in parking lots. A drift line or deposits can occur from one storm on one day and be present for months or years-they do not necessarily indicate sufficient hydrology to call an area a wetland.

Response: See the previous response.

5. B-4 Algal mat or crust- Comment similar to B-3.

Response: See the previous response.

6. B-10 Drainage patterns can result from high water in many cases that are not necessarily events of a permanent time frame. They may indicate a wetland area but more times just water's route. It is virtually impossible to have a Drainage pattern without some form of a drift line or deposits. Therefore, you automatically have wetland hydrology. You will also find sediment deposits in all drift deposits and Drainage patterns. Is not this identifying the same object by different names? The movement of water causes sediment deposits, drift deposits, as well as Drainage patterns.

Response: See the previous response. Furthermore, we do not agree that drift deposits and sediment deposits will necessarily be present in areas that exhibit drainage patterns. These are three different indicators and do not necessarily occur together.

7. B-16 Previously discussed under B-1.

Response: See the previous response.

8. Items in the Group C list. Item C2 and C9 should not be considered Secondary indicators. Granted they have a potential relationship with being associated with the presence of hydrology. They also have association with other items that are not related to hydrology and its level in the ground.

a. C2 Dry-season water table-how is the leap from a water table that is 24 inches below the surface during a dry season equal to one that is less than 12" during normal years? Sometimes not all water tables are effected similarly during dry seasons. A water table that is 24" below the surface may always be 24" below the surface, just as if it were 14" below the surface. How do you determine how dry is dry enough to get the additional 2"?

Response: This indicator is based on the fact that water tables fluctuate seasonally. They are highest during the portion of the year when rainfall is highest and evapotranspiration is lowest, and drop during dry periods. Water tables generally do not remain at the same level throughout the year. Therefore, if the water table is observed at 12-24 inches below the surface during the dry season or in a dry year, the probability is very high that it will rise to within 12 inches of the surface during the normal wet season.

b. C-9 Again these are indicators of concentrated water-moving water not wetland hydrology. Sometimes plant disease patterns are interpreted as flow patterns. Then again hill tops are identified as wetlands on the NWI maps. This item should not be a decision making item but an item that needs field verification.

Response: We agree. That is why indicator C9 requires field verification of wetness signatures seen on aerial photos.

c. D-1. This item should not be a secondary decision making tool but one that indicates a site visit is mandatory.

Response: This is not an off-site procedure. A site visit is almost always mandatory.

Regarding the procedure for wetlands that periodically lack indicators of wetland hydrology.
Why is there only a condition for Drought years and not one for "Overly wet years"? Both of these are cyclic in nature and they cause opposite effects.

Response: This is because sites that are wet only during unusually wet years are generally not a problem for wetland delineation due to the absence of indicators of hydrophytic vegetation and/or hydric soil. The three-factor approach ensures that these areas will not be mistaken for wetlands.

Regarding the Data Form
Are all the regions going to have different data forms?

Response: Yes. Data forms are tailored to the region.

General Comments
It appears that these supplements may change the jurisdictional status of "floodplains", from non-jurisdictional to jurisdictional waters, above and beyond those areas that are presently classified as jurisdictional waters according to the 1987 Corps manual that are found in floodplains.

Response: The basis for this comment is not clear. The supplement does not change the status of floodplains. Only those portions of a floodplain that meet all three factors will be identified as wetlands.

Thomas Peragallo, emailed comments received 24 Sept 2008

The Sample ID should be in a conspicuous place on the [data] form for quick reference. This will avoid confusion when organizing or reviewing several data sheets. How about a block in the top right corner?

Response: We failed to put a space for the "Sampling Point" at the top of the second (vegetation) page of the data form. We will correct the error.

There is no place on the form for the soil horizon designation (A-B-C, etc). This should be the first entry in the soil description.

Response: Many people over the years have recommended that ERDC drop the horizon designation from its 1992 standard data form. Reasons include: (1) this decision requires a soil scientist and is beyond the skills of the typical wetland delineator, (2) it leaves the non-soil-scientist open to challenge in court, and (3) a knowledge of soil horizon designators is not needed to apply the NTCHS hydric soil indicators anyway. Therefore, the new data form only asks for information that is relevant to the evaluation of indicators. If desired by an individual user, the horizon designation can be recorded in the Remarks column.

In my opinion there is insufficient room for redox data entry (this is one of the most important entries).

Response: We will expand the data form to three pages and provide more lines for the soil profile description.

Under hydrology, I would recommend that the two aerial interpretation methods be listed together at the end of the list. They are closely related and would require additional (not a direct field observation) project research.

Response: We agree that these indicators involve offsite resources and, thus, are different from the other indicators. However, rather than create a separate category of data, they are treated as indicators. We list them in two different lists because one is primary and the other is secondary.

Robert J. Pierce, undated comments received 26 Sept 2008 (Responses below are limited to the technical issues raised by the reviewer.)

If all of the changes proposed are adopted, then what is called wetlands will greatly expand as a result of the supplements.

Response: Prior to publication, each draft regional supplement is field-tested by interagency teams at sites across the region. Across the country, field tests at 229 sites examined to date have revealed that the new regional supplements produced the same wetland boundaries as the 1987 Manual with previous guidance at 194 (85%) of these sites. (Within the Northcentral and Northeast Region, 35 of 35 test sites [100%] produced the same boundaries.) Of the 35 sites nationwide with different wetland boundaries, the 1987 Manual with previous guidance produced higher boundaries (i.e., larger wetlands) on 12 sites, and regional supplements produced higher wetland boundaries on 23 sites. The latter result was not unexpected because working groups purposefully developed procedures in regional supplements to capture known problematic wetland types that were missed under the older guidance in the 1987 Manual, such as wetlands with high-pH soils that do not develop hydric soil indicators. Therefore, it is incorrect to claim that regional supplements "will greatly expand" wetland jurisdiction. With each new supplement, the Corps of Engineers has invited the public to test the supplement and provide the data. Unsubstantiated speculation about the impact of regional supplements is no longer useful or appropriate.

The new manual should contain the procedure for doing a complete delineation including non-wetland waters of the U.S. No one can simply submit a delineation of wetlands for jurisdictional purposes.

Response: We disagree. The supplement is intended to support the 1987 Manual, which only addresses wetlands.

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.

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. There were many discussions, species-by-species, region-by-region, about the appropriateness of including those species as hydrophytes. Deciding that a plant such as *Lonicera japonica* has equal probability of occurring in a wetland and non-wetland over its entire range of occurrence in a region is absurd. More importantly, no technical, data-supported justification is given in the draft for making FAC- plants count as wetland vegetation for purposes of Section 404 delineation. Not even the March 3, 1997 proposed modification to the list changed its status. As drafted, the change is arbitrary and capricious and, I believe, would not withstand a DQA or legal challenge. My suggestion is that if you intend to summarily dismiss the pluses and minuses, that all FAC- plants automatically become FACU plants for purposes of Section 404 delineation since FAC- plants were treated as such since 1987. For example, *L. japonica* in the north central region (the only one actually based on real data thanks to Dr. Gerry Wilhelm, Morton Arboretum) remains FACU on the 1997 draft revision to the list.

Response: It is true that disregarding '+' and '-' modifiers has the potential to change some hydrophytic vegetation decisions (however, see the response to the reviewer's first comment above indicating minimal effects on overall wetland determinations.) There are two main reasons for the change: (1) to make the dominance test consistent with the prevalence index, which does not use and never has used 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. Furthermore, the national wetland plant list panel has recently concluded that "+" and "-" modifiers cannot be supported with scientific data and will be dropped from future versions of the plant list unless supporting data exist. Regional and national plant list panels are now reviewing all FAC- species on the list and will revise their indicator status to FAC, FACU, or some other category, as appropriate.

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.

Adopting the Prevalence Index with a 3.0 break perpetuates this insensitivity and is inconsistent with Wentworth, et al. (1988) and Wakely [*sic*] 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, Wakely 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.

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.

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.

p.8, first para. The formulation of this paragraph suggests, that many landscape features that will NOT qualify as wetlands are wetlands. It suggests that floodplains forests are wetlands. Only some areas of floodplains 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 hydric soils nor 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 paragraph is a general description of forested wetlands in the region and where they can be found (i.e., in depressions, on floodplains, flats, and along lake shores). It is not stated or implied that all such areas are wetlands.

p.11, para.1, penultimate 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.

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 FAC, FACU and UPL species is likely to be found on drained hydric soils. The fact is that these plant communities may not be wetlands. The provision on p. 112 (a) *FACU species commonly found in wetlands* essentially dismisses the concept of drained wetlands. All FACU species are known to occur in and sometimes dominate wetlands. If they didn't, they would be rated UPL. To summarily dismiss these species because they are growing on hydric soils is technically indefensible. According to the Department of the Interior, Over have the wetlands in the conterminous U.S. have been lost since European settlement. That means there are over 100 million acres of hydric soils on the landscape that are no longer wetlands. In the Northcentral/Northeast Regions, those areas will often have the species identified at p. 112 (a). Since they typically will occur in landscape positions that are conducive to wetlands (otherwise there would not be hydric soils in the first place), will immediately have at least one secondary hydrology indicator. Many of the other secondary hydrology indicators are so week that they can be found commonly on landscapes without hydric soils. You might as well simplify the process and identify as wetlands all landscapes that have hydric soils. That is what this supplement does so save the public time and money and cut out all the complexity, if that is the intent.

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. The supplement also recognizes that some wetlands in the region have been effectively drained (e.g., page 103) and are no longer wetlands. We don't understand the purpose of this comment.

p. 17, 2nd para. See Comment 5 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: See the previous response on this issue.

p. 17, last para. Not only "most wetlands" but also many non-wetlands in the Northcentral/Northeast will pass the dominance test. That is why the dominance test is insensitive and should be replaced by the FAC-neutral test. "Some wetland plant communities may fail a test based only on dominant species." The converse is equally true. It is very common in the Northcentral/Northeast 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: The dominance test is described in the 1987 Manual, has been in general use in the regulatory program for more than 20 years, and has proven to be a reliable indicator of hydrophytic vegetation, unlike the FAC-neutral test. The three-factor approach to wetland identification, involving indicators of hydric soil and wetland hydrology in addition to hydrophytic vegetation ensures that areas exhibiting indicators of one, but not all three, wetland factors will not be mistaken for wetlands. Thus, there is no bias in the supplement toward calling areas wetlands that are not.

p. 19, 2.b. The landscape can fail the plant dominance test and hydrology and still be considered a wetland because it is "problematic."

Response: No. To be called a wetland, an area must meet the basic definitions of all three wetland factors. However, indicators of these factors may sometimes be missing due to human or natural disturbances or certain well-known problem situations. These situations are clearly explained in Chapter 5.

p. 21. 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.

p. 21. The PI as developed by NRCS used frequency data. Where are the technical data confirming that a PI using absolute cover is valid? There are no data provided to validate the technique when different size plots are used for different strata. For example, herbs are often very patchy. Combining cover for trees in a 30-ft radius plot and herbs from a 5-ft radius plot may be inappropriate. Where are the studies to confirm that the technique is appropriate? PI from NRCS uses frequency along transects – not cover.

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). Therefore, frequency and coverage data are interchangeable in the prevalence index.

p. 31, 2nd full 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 made in the field, not a photograph. But photographs can support a soil profile description by helping a reader or reviewer to visualize soil characteristics.

p.33, 1st 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. Frankly, aside from the fact that there is an exception to every rule, my experience is that it is rare that the wettest part of natural wetlands do not have hydric soils.

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

p. 34-64. 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: The supplement uses the latest version of the NTCHS indicators. The supplement allows the use of TF2 in problem situations if other supporting evidence is present (appropriate landscape position, vegetation and hydrology indicators).

p.66, 1st para. The "technical standard" is fundamentally flawed as discussed above and the NRC said more than 50% probability.

Response: See previous responses to this comment.

p.66, 1. The two-plant requirement should be based upon dominants and preferably native species located in the wetland – not in the nonwetland. Observations in and out of the wetland may differ dramatically.

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. Growing season is a concept generally applied to large units of the landscape. We don't usually recognize a different growing season for each small patch of ground. Thus, the supplement says to evaluate the growing season "in the wetland or in surrounding areas subject to the same climatic conditions …" in recognition of the fact that plant green-up can vary from place to place over short distances due to many factors. The fact that waterlogged areas may lag behind does not mean that their growing season is different. Delayed green-up in these areas is because of their obvious wetland hydrology.

p.66, 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 (senescence since the chloroplasts are one of the first organelles to degrade) – not when leaves fall (abscission). The various regional manuals are allover the board on this concept and many are technically indefensible. There is no more growth once chlorophyll has been degraded – only energy storage from leaves to roots.

Response: Regional working groups have included botanists and plant physiologists who have agreed with the procedure in the supplement. However, this procedure is under review by the National Technical Committee for Wetland Vegetation and will be revised in the future according to their recommendations.

p. 67. 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. Furthermore, the closer to the surface of the land at which the temperature is read, the more diurnal fluctuations will occur. Frequently, temperatures at –30 cm and even –50 cm in aerated soils can fluctuate above and below 5C in a 24-hour period during winter months.

Response: The soil layer within 12 inches of the surface is the zone of interest for wetland identification. (The previous 20-inch depth is an NRCS standard for soil taxonomy.) 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.

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: Correct. That is why the use of WETS tables is only allowed when "on-site data collection is not practical, such as when analyzing previously recorded stream-gauge or monitoring-well data…." If someone is collecting hydrologic data, then "soil temperature should also be monitored…"

p.69, Table 10. many of the C and D Group indictors 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.

p. 71. 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.

p. 77, B5. I believe that the film or sheen on the water surface is a biofilm (polysaccharide) 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: This explanation of the phenomenon does not invalidate the indicator.

p. 78, 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.

p.80, 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.

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 one extraordinary event in the distant past. There is no way to know if the deposit is recent. Furthermore, you can get cracking on slopes when fine-grained soils are eroded from above and wash down the hill.

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.

p.85, B10. This indicator shouldn't be limited to flow patterns – that is flowing water. A depression by its very nature is a drainage pattern. Bent vegetation says nothing about wetland hydrology and should not be an indicator.

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

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 citation is 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. The cautions explain that ice damage does not count.

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 and the investigator can use saturation as the indicator. 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 for wetland hydrology. It needs to be to the surface.

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.

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 Northcentral/Northeast Region? 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. They are often misidentified as discussed in the Draft as well as by roots growing through redox concentrations that are not pore-linings. I do not believe that it is valid to say that the iron may simply be on the root and not in the soil adjacent to the root. The mechanism of development is that water with reduced iron is being sucked thru the soil to the root. If that is the case, then the iron must be in the soil pore lining as well as on the root. Same concept as diffuse vs. distinct boundaries on concretions and nodules.

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.

p. 91, C4. Alpha, alpha'-dipyridyl can give false positive readings in direct sunlight as well as if the solution is old.

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.

p. 92, 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 freshly-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.

p. 93, 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.

p.94, 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.

p. 95, 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. Many areas 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.) My first exposure to crayfish chimneys as a teen was on nonwetland lawns on Vine Street in Eastlake Ohio. Many situations where these are found are not wetlands.

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.

p.96, 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.

p. 99, D2. This should not be a secondary or primary indicator – only supporting information. Your example of the edge of a lake is stupid. Some edges of lakes have wetlands and some don't. At least use a toe of slope if you keep this.

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. The supplement does not imply that all lake fringe areas are wetlands.

p.100, 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 this region.

p. 101, D4. Explain what flark-and-strang topography is for us ignorant peasants.

Response: See the glossary.

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.

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.

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.

Terrestrial Environmental Specialists, Inc. (Joseph M. McMullen) comments received 6 Dec 2008 (only the technical issues or concerns with the draft regional supplement that were raised by Mr. McMullen are addressed here)

One of my complaints with the original 1987 manual and the Regional Supplement is that they do not provide an objective method of determining the edge of the wetland. Wetland delineations involve accurately establishing that edge, but the manuals focus on how you define wetlands, not how you define their limits.

Response: Wetland edges are defined by the extent of those areas that can be identified as wetlands. Therefore, wetland identification and delineation are inseparable. Part IV of the 1987 Manual gives methods for identifying wetland edges. This material is not superseded by the regional supplement. In the future, we hope to revise the 1987 Manual to improve its approach to identifying wetland edges.

Why … have FAC plant species, which are those that by definition occur equally in wetlands and uplands, always been considered wetland species under the vegetation parameter rule? That is not objective. Why are the + and – indicator modifiers eliminated in the proposed Regional Supplement, which means that all FAC- species are added to the list of wetland plants? I would recommend making all FAC- species FACU.

Response: By definition, FAC species occur in wetlands up to 66% of their natural distribution on the landscape. Therefore, the dominance of FAC plants in an area, in combination with indicators of hydric soil and wetland hydrology, is reliable evidence of wetlands. This basic approach has worked well for more than 20 years and is not changed under the supplement. The change in treatment of FAC- ("FAC minus") species under the supplement reflects the conclusions of the national plant list panel,

which concluded that "+" and "-" modifiers could not be supported with scientific data and would be dropped from future versions of the plant list. All FAC- plants are being re-evaluated by national and regional plant panels, and will eventually be assigned a FAC, FACU, or some other appropriate status.

The Regional Supplement bends over backwards to spell out all the exceptions to defining wetlands in the difficult wetlands section (Chapter 5), but tells us nothing about all the exceptions to defining uplands.

Response: Under the 1987 Manual and the regional supplement, an area is by default non-wetland unless it can be demonstrated that it meets the three factors required to determine that it is a wetland. Therefore, there is no need in the supplement to address the characteristics of uplands.

There is a statement on page 15 of this section that says *"In this supplement, absolute percent cover is the preferred abundance measure for all species."* I'm not sure why this is so stated, since relative percent cover is used in the 1987 Manual and the Regional Supplement to determine dominant plant species and these dominants are treated equally regardless of absolute cover values for determining whether hydrophytic vegetation is present. Maybe nothing is meant by the inclusion of the word absolute.

Response: Actually, the required use of absolute cover is a change from the 1987 Manual necessitated by the introduction of the prevalence index as a hydrophytic vegetation indicator. While either absolute or relative cover produce the same results in the dominance test, absolute cover must be used in the prevalence index to avoid biases produced when vegetation strata have different total vegetation coverage.

On page 16, the section on "Seasonal Conditions and Cautions" states that *"the hydrophytic vegetation decision should be based on the plant community that is normally present during the wet portion of the growing season."* Obviously, not a very objective recommendation. Don't plants present during the rest of the growing season tell us something about a wetland/upland edge?

Response: For most plant communities, particularly those dominated by woody species, the hydrophytic vegetation determination can be made accurately at any time of year. However, some communities undergo seasonal changes in species composition or the species that are present may be difficult to identify at certain times (e.g., winter). This statement serves as a caution in communities that may appear to change seasonally from hydrophytic to non-hydrophytic.

One major change in the Regional Supplement is the elimination of the plus (+) and minus (-) modifiers to the plant status indicators, which is addressed on page 17. There is no explanation for the change; it is just stated that *"Plus (+) and minus (-) modifiers are not used..."* What this means is that additional plant species will be considered indicators of hydrophytic vegetation for no apparent reason other than it has been so decreed.

Response: See the previous response on this topic.

The Prevalence Index method of determining hydrophytic vegetation presented in the Regional Supplement is the same as in the 1987 Manual. Meaning it is the same erroneous arithmetic nightmare. My son, who teaches mathematics on a college level, would have a field

day criticizing this methodology. This method assigns numbers one unit apart (e.g. 1, 2, 3) to indicator status categories like they are equally different, when in fact they represent a broad range of fidelity percentages. Then, these number categories are presented in a formula to arrive at a value below which the vegetation is considered hydrophytic. It is at best a tainted system of evaluation. Fortunately, no one uses it.

Response: Actually, the prevalence index is not in the 1987 Manual. However, it is discussed in the cited journal article by Wentworth et al. (1988) and has been used by NRCS for evaluating hydrophytic vegetation. Several studies have shown that the prevalence index correlates well with the presence of hydric soils in a variety of environmental settings.

Of major concern for the vegetation parameter is the accuracy of the indicator status category applied to each plant. The original indicator status list (Reed 1988) has never been formally changed, although the attempt made in the early 1990s by Ralph Tiner and others was published in the Federal Register (USFWS 1997) and underwent significant review, but its formal acceptance fell apart. It is not even acknowledged in the Regional Supplement. We have learned a lot about the fidelity of plants to wetland or upland conditions over the last 20 years and the entire list should be revised to reflect this knowledge.

Response: We agree and this review is currently underway. In 2008, responsibility for the wetland plant list was transferred from the Fish and Wildlife Service to the Corps of Engineers. The nomenclature used in the plant list has been completely revised and brought up to date, plant list regions have been reorganized along the same regional boundaries used by the regional supplements, and regional plant list panels have been re-convened. The indicator status of every plant on the list is currently under review by interagency panels. The public will have input into this process after the regional panels make their preliminary assignments.

For the wetland hydrology indicators more cautions should be stated. Reference back to the original manual and the wetland definition relative to *the presence of hydrology for a specified duration during the growing season* should be explicit.

Response: Every wetland hydrology indicator has a Cautions and User Notes section that gives guidance on its proper application.

Growing season is redefined in the Regional Supplement using plant activity and soil temperature indicators. Several plant activity indicators are provided to reflect the start of the growing season. The problem is that the Regional Supplement proposes to use these plant activity indicators in the wetland or "surrounding areas." In our northeast region, plant activity in wetlands lags behind adjacent uplands because of the presence of water in wetlands, which takes on heat very slowly. Use of plant activity in surrounding uplands to indicate the beginning of the growing season in wetlands is not proper.

Response: Growing season is a concept generally applied to large units of the landscape. We don't usually recognize a different growing season for each small patch of ground. Thus, the supplement says to evaluate the growing season "in the wetland or in surrounding areas subject to the same climatic conditions …" in recognition of the fact that plant green-up can vary from place to place over short distances due to many factors. The fact that waterlogged areas may lag behind does not mean that their

growing season is different. Delayed green-up in these areas is because of their obvious wetland hydrology.

Soil temperature is also used to indicate the duration of the growing season as it was in the 1987 Manual, but the depth at which the soil must be above 5°C (41°F) was changed from 20 inches in the 1987 Manual to 12 inches in the Regional Supplement. There is no explanation of why this expansion of the growing season is appropriate.

Response: The original 20-inch depth was based on Soil Taxonomy and is the depth below which most diurnal changes in soil temperature are damped out. The supplement raises the required depth to 12 inches because the upper 12 inches of the soil profile is the zone of interest for wetland delineation.

Why is water-stained leaves now a primary indicator?

Response: In the opinion of the regional working group (and most working groups across the country), water-stained leaves, which are produced when fallen leaves are inundated for long periods during the growing season, are strong stand-alone evidence for recent wetland hydrology.

There are not enough precautions or warnings about the use of the hydrology indicators, especially for the less experienced delineator. In Group B, the evidence of recent inundation by water marks, sediment deposits, or drift deposits must be carefully used, because these indicators may not be present for the proper duration or the proper time of the year to meet the wetland hydrology definition.

Response: The role of wetland hydrology indicators is explained in the introduction to Chapter 4. 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 endorsed by the National Academy of Sciences in 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 Northcentral and Northeast regional 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. Therefore, the 3 factors are designed to work together to identify wetlands. They do not have the same roles or reflect the same things. Only long-term hydrologic monitoring can provide more reliable information about the hydrology of a site, and this is impractical under most circumstances.

Inundation visible on aerial imaging is a very questionable newly proposed primary indicator of hydrology. In our region, most aerial photographs are taken during leaf-off conditions in late fall/early winter or late winter/early spring periods. Areas that show evidence of inundation at those times outside of the growing season, especially after snow melt in spring,

are not reflective of wetland hydrology. Using aerial photographs to show areas of inundation is a helpful tool, but it should not be a positive primary indicator.

Response: The Cautions and User Notes to this indicator express the same ideas. Just as with direct onsite observations of flooding or ponding, the user must consider whether recent precipitation has been normal and, if the observation is made outside of the growing season, whether the inundation is likely to extend into the growing season. With these caveats, the working group believes that the presence of surface water in a photograph deserves the same status (primary) as the direct observation of surface water during a site visit.

Surface soil cracks, although secondary, is another poor indicator. Such cracks are very common in upland areas in silt/clay soil where water pools for short durations.

Response: Surface soil cracks are unequivocal evidence of recent ponding but, as pointed out in the User Notes, can also occur in temporary upland ponds and puddles. However, the three-factor approach, involving indicators of hydric soil and hydrophytic vegetation as well as wetland hydrology, ensures that these areas will not be mistaken for wetlands.

The bias starts in the first paragraph [in the Difficult Wetland Situations chapter] of the Introduction, with the first sentence stating *"Some wetlands can be difficult to identify because wetland indicators may be missing due to natural processes or recent disturbance."* It would be nice if there was a second sentence that read, *"Conversely, certain uplands can be difficult to identify because upland indicators may be missing due to natural processes or recent disturbance."*

Response: There are no such thing as "upland indicators" and they are unnecessary. Under the 1987 Manual, areas are upland by default unless they meet wetland criteria.

Later in the first paragraph it states that *"Problem area wetlands are naturally occurring wetland types that lack indicators of hydrophytic vegetation, hydric soil, or wetland hydrology periodically due to normal seasonal or annual variability, or permanently due to the nature of the soils or plant species on the site."* It should be acknowledged that the converse is true and would be stated: *"Problem area uplands are naturally occurring upland types that lack indicators of upland vegetation, upland soil, or upland hydrology periodically due to normal seasonal or annual variability, or permanently due to the nature of the soils or plant species on the site."* Sections addressing the latter situations are missing from the Regional Supplement and should be added.

Response: See the previous response.

All of the subsections under "4. Specific Problematic Vegetation Situations," starting on page 107, have problems that contravene the basic three-parameter approach of defining wetlands. These sections should be eliminated or revised.

Response: In the sections on Atypical Situations and Problem Areas, the 1987 Manual discusses various examples in which wetlands may lack hydrophytic vegetation indicators due to human or natural disturbance, or to seasonal or annual variability. Wetlands in these areas may still be identified accurately using procedures given in these sections. The regional supplement does not change the intent or overall approach

of the 1987 Manual in these situations. It simply gives examples and options for atypical and problem situations that are common in the region.

I was surprised by the wording under "5. General Approaches to Problematic Hydrophytic Vegetation" starting on the bottom of page 111. Part a. of that subsection is entitled "FACU species commonly found in wetlands." This subsection lists a number of FACU species that may be found in wetlands. This should not be unusual, since FACU species are defined as those that may be found in wetlands up to one-third of the time. The list of these FACU species includes common buckthorn, which is listed as UPL (upland) in Reed (1988). The procedure for dealing with areas where we find these species is to: "drop any FACU species listed above from the vegetation data, and compile the species list and coverage data for the remaining species in the community." Such a procedure expands the limits of the jurisdictional wetland area and is contradictory to the three-parameter approach used to define wetlands.

Response: We will rename this section "FACU species that commonly dominate wetlands." It is intended to highlight a problem caused by particular FACU species that often dominate wetlands in the region to the extent that they fail hydrophytic vegetation indicators. We recognize that FACU species are commonly found in wetlands. The problem arises when certain FACU species regularly dominate areas that clearly have hydric soils and wetland hydrology. On such sites, these FACU species are expressing their ability to act as hydrophytes. Perhaps the most obvious example in this region is eastern hemlock, some ecotypes of which can grow in monotypic stands in peat soils that are saturated to the surface for much of the year. The final draft will list only 10 plant species (out of roughly 450 FACU species in the region), which the working group proposes for special treatment when found in otherwise obvious wetland situations. ERDC would appreciate comments to help us refine this list, but we concur with the working group that the problem should not be ignored.

Jim Turenne, NRCS, letter dated 15 Sept 2008

The 1987 Manual allowed the use of "Field Indicators for Identifying Hydric Soils in New England" a document produced by the New England Hydric Soils Technical Committee (NEHSTC) and distributed by the New England Interstate Water Pollution Control Commission (NEIWPCC) to satisfy the hydric soil parameter. This document is the result of over 16 years of work by the NEHSTC, a group of Federal, State, University, and Private Sector soil and wetland scientists that have focused their expertise to the New England Region to develop the indicators to result in a hydric soil boundary based on wetland science and in conjunction with plants and hydrology. The regional supplement should allow the use of the New England Field Indicators (current version) for areas that are meeting the plant and hydrology indicators but are not meeting the National Hydric Soils indicators. This could be simply added under the Hydric Soil Indicators for Problem Soils section starting on page 60. This section could limit the use of the New England guide to the New England region only rather than trying to define an MLRA boundary (which is not an exact line on the ground).

Response: The 1987 Manual never mentions the "Field Indicators for Identifying Hydric Soils in New England" or any other indicators for hydric soils other the those listed in the 1987 Manual (paragraphs 44 and 45 of the Manual). A memo dated September 17, 1998, from John Studt, Chief of Regulatory for the US Army Corps of Engineers stated specifically that the National Technical Committee for Hydric Soils (NTCHS) "Field Indicators for Hydric Soils in the United States" could be used for problem soils and

when correlated with existing 1987 Manual indicators. The 1998 memo also never mentioned "Field Indicators for Identifying Hydric Soils in New England." However, the New England District of the Corps has in the past supported the use of the New England indicators.

One goal of the project to develop regional supplements to the 1987 Manual has been to develop lists of wetland indicators based on ecoregion concepts rather than political boundaries. Thus we have used combinations of the USDA Land Resource Regions (LRR) and Major Land Resource Areas (MLRA) to develop wetland delineation regions within which wetland conditions are fairly consistent, allowing better tailoring of wetland indicators.

Although the NEHSTC has been trying to propose some of the indicators contained in the New England guide the process is very complex and time consuming. While the National soils guide captures many of the soil conditions it was not developed with representation from anyone from the Northeast and there are currently no members from the Northeast on the NTCHS. We have some unique soils and geology and also land-use demands that often require a precise boundary to be flagged and allowing the use the New England guide will help better define the wetland edge for the Northeast.

Response: Throughout this project, the Corps of Engineers has worked closely with the NTCHS on the identification of hydric soil indicators for each supplement. The procedure for proposing new indicators and commenting on existing indicators has been published and in place for many years. We welcome the decision by the New England Hydric Soils Technical Committee to submit data to NTCHS in support of their proposals. Participation by the New England committee will likely have benefits beyond the borders of the New England states.

Page 30: Observe and Document the Soil – there needs to be more information to the use of the process of describing and documenting soil morphology. Reference to Chapter 3 of the Soil Survey Manual (http://soils.usda.gov/technical/manual/contents/chapter3_index.html) that provides detailed procedure for describing soils should be added along with the Field Book for Describing Soils (http://soils.usda.gov/technical/fieldbook/), another excellent guide is the NEIPCC supplement for Version 3 (http://www.neiwpcc.org/neiwpcc_docs/V3_Supplement.pdf). The section should cover soil textural determination and how to describe the layers (what soil scientists call soil horizons). More on the description sheet section.

Response: Great care and the input of dozens of soil scientists and wetland delineators experienced with describing soils for the purpose of hydric soil identification have gone into the design of the data form in the supplement. It asks only for the basic information required to document the presence or absence of a hydric soil. Additional information about the details of soil texture, horizon designations, etc., is not necessary to the hydric soil determination. However, if desired by the user, additional data can be recorded in the Remarks sections of the form or on a separate sheet.

Figure 9 photo on page 37 is not a Histic Epipedon but from a poorly drained Raynham Soil (I have direct knowledge of this). A better photo should be selected.

Response: We will use the best photo available to us.

Page 43 – I know it is not possible to change the National indicator through this comment but the requirement of a 6 inch layer to make depleted is too thick for soils in the Northeast. Most of our soils with depleted have a 2-4 inch depleted zone under the dark surface as this is the zone of high microbial demand and thus depletion of oxygen. Many of our soils actually brighten up below the depleted layer. Indicator VI or VII in the New England version 3 should be listed in the user notes if the area meets hydric plants and hydrology.

Response: This change can be made easily by submitting the proposal along with appropriate data to the NTCHS.

Page 50 Indicator S6 – Although this indicator has a long history of being poorly written, difficult to interpret, etc. and has been voted by the Northeast NCSS Hydric soils committee I think it need to be moved to the problem soils section if the other two parameters are met (veg, hydro). Currently there is problems with the National Hydric soils addressing spodosols in the northeast, the NEHSTC has a proposed mesic spodic indicator (can be sent upon request) that was developed by a sub-committee by reviewing over 35 pedons with hydro data and veg. Without this indicator many of our poorly drained hydric soils will not meet a National. Morphology associated with these soils is complex and they tend to occur on the line.

Response: The supplement follows the recent decision by the National Technical Committee for Hydric Soils to retain indicator S6 (Stripped Matrix) throughout the NC/NE region.

Page 51 Indicator S7 – A map of 149B should be added as the boundary extends into SE Plymouth County and the south shore of RI. S7 also applies to region R in Version 6 so that needs to be changed in the "Applicable sub region" section. Also the user notes say it is applicable to interdunal swales – this indicator occurs in outwash areas and can be found throughout the region.

Response: MLRA 149B is shown in Figure 1 of the draft supplement but not at a large enough scale for the purpose of applying this indicator. We will add a more detailed figure to this indicator description. However, the USDA MLRA description for MLRA 149B includes only Block Island in Rhode Island.

Hydric Soil Indicators for Problem Soils section – F20 – Anomalous bright loamy indicator should be extended to New England within 200 m from estuary. I have seen this morphology in my mapping along the coastal zone.

Response: Data to support this change should be submitted to NTCHS.

Wetland Hydrology Indicators – Indicator C4- reduced iron user notes could add or use IRIS tubes if monitoring is an option, removal of iron from the tube remaining for 1 month or more within 12 inches should make this indicator.

Response: Indicators are things that can be observed in a brief site visit. For the evaluation of C4 (Presence of Reduced Iron), the use of IRIS tubes would require a long monitoring period and, thus, goes beyond the concept of an indicator. However, the use of IRIS tubes is sanctioned by NTCHS as part of the technical standard for hydric soils, mentioned in Chapter 5 of the supplement for use with problem soils.

Indicator D6 needs to be added for soil survey and wetland mapping (NWI and State wetland maps) as a secondary indicator. This was part of the 1987 manual and needs to be added. These maps are records of what or how someone (a qualified soil or wetland scientist) interpreted the area as part of the resource inventory mapping process.

Response: In a letter dated May 2, 2006, the NTCHS recommended to the US Army Corps of Engineers that using soil survey data as an indicator of wetland hydrology is an inappropriate use of the data. Due to issues of scale and the natural variability of soils within mapping units, soil survey descriptions and tabular data are not sufficiently site-specific for use as wetland hydrology indicators. The NTCHS and the regional supplement continue to encourage people to use soil survey data as an off-site tool to identify broad areas where hydric soils are likely to be found.

Appendix C Data Form – Soil profile description form needs to be a whole page as keying out the soils involves doing a detailed description of the upper 20-24 inches, as currently designed it will be difficult to fill out neatly and be able to read. A column for (interpreted) soil horizon is needed – although the national does not use horizons for some reason it is still needed for the describer to document what they interpret to be occurring in the soil – is the layer a Bg (gray colors due to wetness) or a Bw (gray colors are lithochromic as in dark parent material) – is it a E horizon and thus redox concentrations needed for depleted (which we do not find redox concentrations in our Eg horizons). Depths need to be in cm not inches.

Response: The space provided for hydric soil descriptions has been increased by expanding the entire data form to three pages. However, the form is still limited to the information required to determine the presence or absence of hydric soil indicators. Additional information about horizon designations is not necessary for the determination of a hydric soil and, therefore, was not included. If desired, horizon data can be included in Remarks. All measurements in the supplements are expressed in inches.

Williams Creek Consulting, Inc. (Brian Catt) letter dated 19 Sept 2008:

The proposed combination of all Facultative species (FAC+, FAC, & FAC-) into one category of FAC, will effectively include all FAC- species as wetland plants, when valuating the hydrophytic vegetation criterion. This change is particularly worrisome for the regulated public since the potential for meeting the hydrophytic vegetation criterion at any given sampling area is greatly increased via inclusion of numerous additional "wetland" species subject to the dominance test. … Inclusion of these species as wetland indicators will result in the designation of greater amounts of hydrophytic communities, and therefore, result in greater amounts of wetland determinations.

Response: We understand the concern, which has been discussed in every regional working group. However, field testing of regional supplements across the country has shown that the concern is exaggerated. On 229 sites sampled to date across the country, only four had higher wetland boundaries due to changes in the treatment of FAC- plants (including zero of 35 sites in the Northcentral & Northeast region). Furthermore, recently the national panel for the wetland plant list concluded that "+" and "-" modifiers could not be supported with scientific data and would be dropped from future versions of the plant list. All FAC- plants are being re-evaluated by national and regional plant panels, and will eventually be assigned a FAC, FACU, or some other status.

If the regional supplements are truly intended to represent regional variations in wetland characteristics, then it seems logical to concurrently publish a revised *National List* of *Plant Species that Occur in Wetlands*, which considers species distribution and occurrence, appropriate for each supplement region.

Response: This suggestion is now being implemented by regional and national plant panels.

We anticipate that the additional documentation and quantification required by the Regional Supplement (particularly with the hydrophytic vegetation parameter) will require approximately 30%-80% more time (particularly in the difficult areas) to complete the field and paperwork associated with each data collection point. This will result in the cost of a typical wetland delineation to increase significantly.

Response: After users become familiar with the new indicators, procedures, and data requirements, the amount of time to complete a delineation should decline. However, one goal of the working group was to increase the rigor of data collection and reporting in an effort to improve the accuracy and defendability of wetland determinations.

Determination of primary hydrology indicators through use of aerial photography will likely lead to misrepresentation of hydrological conditions. Most aerial photography is collected during leaf-off conditions in order to achieve greater accuracy of surface conditions. This would lead to interpretation of hydrological conditions outside the growing season. If the supplement manual is going to require that wetland delineations be performed during the growing season, it would be inappropriate to utilize hydrological data based determined outside the growing season. We do, however, recognize that aerial photography review for evidence of inundation is valuable for identifying locations of potential wetlands. We recommend that "inundation visible on aerial" be included as a secondary indicator.

Response: The working group believes that inundation seen on an aerial photograph should be given the same weight as inundation observed during a site visit (both are primary indicators). In both cases, the User Notes caution that precipitation occurring prior to the observation should be evaluated for normality. It is appropriate to discount inundation observed only after an unusual rainfall event or during an abnormally wet period. In addition, inundation seen outside the growing season is discounted unless experience indicates that such inundation typically lasts into the growing season. It is not necessary to require that wetland delineations be done only during the growing season, but caution and common sense are needed in applying this and most other indicators.

Several primary and secondary hydrology indicators effectively use hydric soil indicators as a surrogate for wetland hydrology indicators. This places a disproportionate amount of reliance on the hydric soils parameter and weakens the concept of a three parameter test.

Response: Actually, only "Hydrogen Sulfide Odor" is used as both an indicator of wetland hydrology and hydric soil, and the reasons are explained clearly in the User Note. The National Technical Committee for Hydric Soils (NTCHS) considers it to be a test-positive indicator of hydric soil. In addition, the sulfidic odor is only produced by soils that are currently saturated and reduced, thus exhibiting wetland hydrology. The indicator clearly satisfies the basic definitions for both factors. This does not undermine

the required three-factor approach because the basic definitions of all three factors are met.

Secondary indicators of "saturation visible on aerial" and "geomorphic position" are nearly always mutual, resulting in the application of two secondary indicators (and consequently meeting the wetland hydrology test). This concept does not allow for consideration of drainage when evaluating the potential presence of wetland hydrology, which is often present in agricultural situations. Relic vs. recent hydric soil features (particularly dark surface coloration) are impossible to distinguish from aerial photos.

Response: The pairing of these two secondary wetland-hydrology indicators is appropriate and would provide strong evidence for the presence of wetland hydrology. However, we think this would occur only rarely because aerial photos that show saturation are not common. It is more likely that the Geomorphic Position indicator would be paired with some other indicator. The possibility that an agricultural site may be effectively drained must be considered in relation to a number of wetland hydrology indicators (note the discussion of drainage systems in Chapter 5). Hydric soil features should never be evaluated from aerial photography, and the supplement does not suggest this.

The manual description of difficult situations regarding agricultural land is too liberal, which may result in substantial amounts of current agricultural land designated as jurisdictional wetlands.

Response: We do not understand the comment. This section gives options for determining whether hydrophytic vegetation, hydric soils, and/or wetland hydrology are present on lands intensively managed for agriculture. It is consistent with the existing guidance given in the 1987 Manual for Atypical Situations.

The section relies too much on soils parameter, which are often disturbed in agricultural settings.

Response: We do not understand the comment. There is no particular emphasis given to the soils factor in this section. All three factors are discussed with equal emphasis.

The manual does not provide detail on determination of relic or recent hydric features. Additional training would be necessary in order to accurately determine these conditions. We request that proper recommended training courses be established prior to preparation of the supplement manual.

Response: This topic is beyond the scope of the supplement. We recommend that a soil scientist with local experience be consulted if there is a need to distinguish relict hydric soil features.

We recommend not using aerial photo as an indicator of wetland hydrology, since there is no way to determine duration of inundation from photo. Example exercises resulted in numerous acres of developed agricultural land considered wetland. This conclusion may result in loss of income to farms as a result of lost government subsidies for farmers removing wetlands for farm production.

Response: The Corps of Engineers wetland delineation manual and new Regional Supplements are for Clean Water Act applications. They do not affect farm subsidy programs.

We recommend clarification on the preferred soil survey resource (on-line vs. NRCS Soil Survey) is preferred when evaluating soils. Due to changes in nomenclature, discrepancies in soil types have been encountered. In addition, the on-line soil survey does not currently provide soil profile information in order to accurately confirm soil types identified on the survey.

Response: In general, the NRCS Web Soil Survey provides more recent data and is therefore preferred over published hard-copy soil surveys. However, the Regional Supplement identifies hydric soils based on indicators observed during an on-site inspection and not published soil maps. It is not necessary to "confirm soil types" when making a hydric soil determination.

Review of the regional maps has led to a significant potential for confusion or use of the wrong supplement by both applicants and permit regulatory agencies. There does not appear to be a detailed discussion of how these regions were derived. We recommend evaluating determination of the regions by watershed or District boundary lines to ensure consistency and proper applicability.

Response: As explained in the supplement, wetland delineation regions are based on USDA Land Resource Regions (LRR) and Major Land Resource Areas (MLRA). The proper combinations of LRRs and MLRAs for each region were determined by regional working groups of wetland experts. The regions are illustrated in each supplement and GIS layers showing these regions are available from the NRCS MLRA web site or from the editor of the supplement. In any case, the selection of the proper supplement for a particular site depends both upon its location relative to mapped region boundaries, and the physical and biological characteristics of the site compared with descriptions given in each supplement. If there is any doubt in a transitional area, apply both supplements and compare the results.

We also recommend development of a more accurate map of regions. The preferred resource would consist of a GIS layer in order for the consultants and agencies to accurately determine the correct supplement manual.

Response: See the previous response.

The concepts presented in the Regional Supplement, particularly the "Difficult Wetland Situations" section, appear to greatly expand the definition of wetlands. It appears that with these new procedures, the burden of proof is shifted from demonstrating that an area meets the three parameter test, and is therefore a wetland, to proving that an area is not a wetland.

Response: We disagree. There has been no change in the wetland definition or basic three-factor approach to determining wetland boundaries as described in the 1987 Manual. The supplement simply provides an updated and refined set of indicators for each factor based on more than 20 years of experience since the 1987 Manual was published. Field testing has indicated that wetland boundaries on the majority of sites do not change under the new supplements but the wetland determinations are more objective and defendable.