

Subject: RE: Nutrient Leaching

Date: Thursday, March 3, 2016 at 1:45:35 PM Mountain Standard Time

From: Hesketh, Eric - NRCS, Amherst, MA

To: Case,Shaun, Jack Carlson

CC: Miller, Andrew - NRCS, Washington, DC, David,Olaf, Bagdon, Joseph - NRCS, Amherst, MA, Gross, Chris - NRCS, Beltsville, MD

I think you've got it right.

Just to make things clear. 3) WQM-02 should always output the wtbl_top_min value. (Already changed in code, as of today) – when wtbl_top_min does not exist for a soil it should return a blank or null.

WQM-02 should also return:

```
name": "aoa_comp_wtbl",  
  "value": "None",  
  "Description": "Kind of water table"
```

I'm assuming that is being returned but the description of the response <https://alm.engr.colostate.edu/cb/issue/6520> hasn't been updated.

Eric

From: Case,Shaun [mailto:Shaun.Case@ColoState.EDU]

Sent: Thursday, March 03, 2016 3:14 PM

To: Hesketh, Eric - NRCS, Amherst, MA <eric.hesketh@ma.usda.gov>; Jack Carlson <pspicata@rams.colostate.edu>

Cc: Miller, Andrew - NRCS, Washington, DC <Andrew.L.Miller@wdc.usda.gov>; David,Olaf <Olaf.David@colostate.edu>; Bagdon, Joseph - NRCS, Amherst, MA <joseph.bagdon@ma.usda.gov>; Gross, Chris - NRCS, Beltsville, MD <chris.gross@wdc.usda.gov>

Subject: Re: Nutrient Leaching

Okay. Thanks for the responses.

Some clarifications:

Many services are designed to take input that was generated by another service. These subsequent calls are not always done immediately, nor are they always "chained" by another service, such as what WQM-21 does. Consequently, though logic dictates that no-one should ever call service "x" without first calling service "y", that does not imply that the user would always be calling them all directly, or immediately in sequence. In the cases of WQM-02/05/06, the specifications would indicate that they are intended, initially to be called separately since

they deliver and consume different data from each other, and the input data to them, though typically achieved from other service calls, could be generated through other means by a consumer, as well, such as from storage of previous calls to other services or from building a query to the service based on information known to the user from their expertise/research, etc.

The WQM-21 service allows the "chaining" of service calls so that there is no user interaction between or during that process of moving result data from one service call to input of yet another service call. However, if a user has data achieved from a previous call to WQM-02, they may submit it to WQM-21, bypass a call to WQM-02 again, and just pass the information to WQM-05/06. (Note, WQM-05 and 06 return different data from each other, so chaining WQM-05 to WQM-06 through WQM-21 does not return WQM-05's data to the user, but rather only returns the final results of WQM-06)

So, the process of updates, as I see it, is:

- 1) WQM-05 should always require the `wtbl_top_min` parameter. [However it is acquired by the calling program/user] (Some users may store data acquired from a previous call to WQM-02 and use it as input)
- 2) WQM-21 should always require the `wtbl_top_min` parameter if a calling program is attempting to call WQM-05/06 without first calling WQM-02. (This would be useful for when data was stored by a user from a previous call to WQM-02 and simply wants to chain the calls to WQM-05/06 at a later time for that data.)
- 3) WQM-02 should always output the `wtbl_top_min` value. (Already changed in code, as of today)
- 4) WQM-05 needs the specified changes to the calculations based on the items 1-4 specified in the initial email.

How does that sound?

Thanks,
Shaun.

From: "Hesketh, Eric - NRCS, Amherst, MA" <eric.hesketh@ma.usda.gov>
Date: Thursday, March 3, 2016 at 12:53 PM
To: Shaun Case <Shaun.Case@ColoState.EDU>, Jack Carlson <pspicata@rams.colostate.edu>
Cc: "Miller, Andrew - NRCS, Washington, DC" <Andrew.L.Miller@wdc.usda.gov>, "David,Olaf" <Olaf.David@colostate.edu>, "Bagdon, Joseph - NRCS, Amherst, MA" <joseph.bagdon@ma.usda.gov>, "Gross, Chris - NRCS, Beltsville, MD" <chris.gross@wdc.usda.gov>
Subject: RE: Nutrient Leaching

My response, in rust below, to your response to my response to your response to Christine....

Eric

From: Case,Shaun [<mailto:Shaun.Case@ColoState.EDU>]
Sent: Thursday, March 03, 2016 11:28 AM
To: Hesketh, Eric - NRCS, Amherst, MA <eric.hesketh@ma.usda.gov>; Jack Carlson <pspicata@rams.colostate.edu>
Cc: Miller, Andrew - NRCS, Washington, DC <Andrew.L.Miller@wdc.usda.gov>; David,Olaf <Olaf.David@colostate.edu>; Bagdon, Joseph - NRCS, Amherst, MA <joseph.bagdon@ma.usda.gov>
Subject: Re: Nutrient Leaching

Tried some HTML reformatting below as the formatting may have been lost in the original message....Please see below:

From: Shaun Case <Shaun.Case@ColoState.EDU>

Date: Thursday, March 3, 2016 at 9:26 AM

To: "Hesketh, Eric - NRCS, Amherst, MA" <eric.hesketh@ma.usda.gov>, Jack Carlson <pspicata@rams.colostate.edu>

Cc: "Miller, Andrew - NRCS, Washington, DC" <Andrew.L.Miller@wdc.usda.gov>, "David,Olaf" <Olaf.David@colostate.edu>, "Bagdon, Joseph - NRCS, Amherst, MA" <joseph.bagdon@ma.usda.gov>

Subject: Re: Nutrient Leaching

Hi Eric,

Sure.

For those unfamiliar with the abbreviations for the nutrient services:

WQM-02: Soil Component Attributes (WQMSoilAttributes)

WQM-05: Nutrient Soil Leaching Potential (NutrientSLP)

WQM-06: Sediment and Nutrient Soil Runoff Potential (SedNutSRP)

WQM-21: Nutrient Soil Leaching and Runoff Loss Potentials for an Area of Analysis (NutrientSLP-SRP) - The services combines WQM-02, WQM-05, and WQM-06 services into a single service.

1.0 Currently:

1.1) WQM-02 can be called by WQM-21 or can be called separately/independently. This is what I expect – this should be no problem with the addition of “wtbl top min” in the export (response). I see WQM-02 as the starting point for nutrient and pesticide loss calculation services.

1.2) WQM-05 can be called by WQM-21 or can be called separately/independently. When WQM-21 is run it should automatically run WQM-02. WQM-05 still needs to run WQM-02 get a set of soils to work on.

1.3) WQM-21 can call WQM-02 before calling WQM-05/06, or can be used to call WQM-05/06 without calling WQM-02. Since WQM 05/06 both require the detailed soils package created by WQM-02, you should not be able to call them without running WQM-02 at least once.

2.0 Discussion:

2.1) Altering the output of WQM-02 is not an issue and would not affect any other services or client programs that I am aware of. Are there any concerns others have? I have no at this time. It should be straightforward.

2.2) Altering the input of WQM-05 to accept the new output of WQM-02 requires a change to the WQM-05 logic. WQM-05 logic has to be changed anyway to remove the effects of drainage from the nutrient leaching algorithm and to determine if the component has a water table with 76 cm of the soil surface.

a) In the cases where WQM-05 is called independently of the service call chain from WQM-21 it will require a new parameter (wtbl top min) to be specified in order to alter the calculations as requested

i) This requires the calling client software to have collected this value from somewhere in order to specify it as input. WQM-02 should be called in order to provide the data requested for WQM-05.

ii) In the cases where the calling client software cannot specify this value, i.e. has no way of uncovering its value As mentioned earlier, I can't see where the calling software shouldn't be calling WQM-02 first. I tried to make WQM-02 a one stop shop for inputs to both nutrient and pesticide loss WQM services.

- 1) A default value must be used - Default to calling WQM-02
- 2) Or the calculation logic will need to account for its missing state. ""

b) When WQM-05 is called from WQM-21, without the specification in input that causes WQM-02 to be called first, then WQM-21 needs to generate this value somehow. This should not happen. WQM-02 should be called at least once. If WQM-05/06 can be run several times, it should run on data persisted from the last WQM-02 run. If the list of soils changes (for example a different polygon is being described) WQM-02 should be re-run.

i) This can be added as a new required parameter to WQM-21 in the cases where WQM-02 is not specified as being called, based on the current input methods. Since I'm not up to speed with how WQM-21 is designed, I'll need to make a few assumptions. If WQM-21 simply "batch runs" the WQM-02,WQM-05,WQM-06 services, then WQM-02 needs to share its response (output) format including "wtbl top min" with WQM-05/06 which needs to accept the value as input. If WQM-21 is written as a separate service, then it needs to be updated to be mirror WQM-02, WQM-05 and WQM-06.

ii) This can be some default value as in 2.2.a.ii.1 or some altered logic as in 2.2.a.ii.2. See above

Hope this helps.

Thanks,
Shaun.

From: "Hesketh, Eric - NRCS, Amherst, MA" <eric.hesketh@ma.usda.gov>
Date: Thursday, March 3, 2016 at 9:08 AM
To: Shaun Case <Shaun.Case@ColoState.EDU>, Jack Carlson <pspicata@rams.colostate.edu>
Cc: "Miller, Andrew - NRCS, Washington, DC" <Andrew.L.Miller@wdc.usda.gov>, "David,Olaf" <Olaf.David@colostate.edu>, "Bagdon, Joseph - NRCS, Amherst, MA" <joseph.bagdon@ma.usda.gov>
Subject: RE: Nutrient Leaching

Shaun:

Could you clarify 1) below?

Eric

From: Case,Shaun [<mailto:Shaun.Case@ColoState.EDU>]
Sent: Thursday, March 03, 2016 10:41 AM
To: Whitley, Christine - NRCS, Fort Collins, CO <Christine.Whitley@ftc.usda.gov>; Jack Carlson <pspicata@rams.colostate.edu>
Cc: Miller, Andrew - NRCS, Washington, DC <Andrew.L.Miller@wdc.usda.gov>; David,Olaf <Olaf.David@colostate.edu>; Hesketh, Eric - NRCS, Amherst, MA <eric.hesketh@ma.usda.gov>; Bagdon, Joseph - NRCS, Amherst, MA <joseph.bagdon@ma.usda.gov>
Subject: Re: Nutrient Leaching

:-)

Answers:

1) Yes. Just a quick one, most likely, about how they would like the services, which are also available outside of the call to WQM-21, to change in light of the change request. Specifically, should we add a new required parameter, or make it optional with either a default value or default logic to pursue if it is missing from the input.

2) Yes and no. We do have a separate tracker system, which I am happy to update. However, since I do not have access to your tracker system, I don't have the information from it to make a tracker on our side. (Like you, I prefer to keep duplicate copies of things, if any, as exact copies of each other.)

3) I will keep you updated if there are any changes.

Eric, Joe,

Please feel free to contact me with any discussion or details I may have missed.

Thanks,

Shaun.

From: "Whitley, Christine - NRCS, Fort Collins, CO" <Christine.Whitley@ftc.usda.gov>

Date: Thursday, March 3, 2016 at 8:31 AM

To: Shaun Case <Shaun.Case@ColoState.EDU>, Jack Carlson <pspicata@rams.colostate.edu>

Cc: "Miller, Andrew - NRCS, Washington, DC" <Andrew.L.Miller@wdc.usda.gov>, "David,Olaf" <Olaf.David@colostate.edu>, "Hesketh, Eric - NRCS, Amherst, MA" <eric.hesketh@ma.usda.gov>, "Bagdon, Joseph - NRCS, Amherst, MA" <joseph.bagdon@ma.usda.gov>

Subject: RE: Nutrient Leaching

You are so good at responding promptly Shaun – I appreciate it.

You are saying you need to discuss yesterday's clarification questions with Eric / Joe?

And then (CSU) has a tracker which needs to be updated with the results?

Any details added please give me a list / summary – I would like to update our tracker here.

I will just watch for your notification that you have the clarifications you need then.

Christine Whitley

USDA/NRCS Contractor – Team Vistrionix

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christine.whitley@ftc.usda.gov

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From: Case,Shaun [<mailto:Shaun.Case@ColoState.EDU>]
Sent: Thursday, March 03, 2016 8:18 AM
To: Whitley, Christine - NRCS, Fort Collins, CO <Christine.Whitley@ftc.usda.gov>; Jack Carlson <pspicata@rams.colostate.edu>
Cc: Miller, Andrew - NRCS, Washington, DC <Andrew.L.Miller@wdc.usda.gov>; David,Olaf <Olaf.David@colostate.edu>
Subject: Re: Nutrient Leaching

Christine,

No problem, I will let you know. But, first, we need to finish the discussion/clarification and I will need to get a copy of the details of the tracker request so that I can follow it correctly and not miss anything new or changed that may be altered post discussion from the detail of Eric's email.

Thanks!
Shaun.

From: "Whitley, Christine - NRCS, Fort Collins, CO" <Christine.Whitley@ftc.usda.gov>
Date: Thursday, March 3, 2016 at 7:22 AM
To: Shaun Case <Shaun.Case@ColoState.EDU>, Jack Carlson <pspicata@rams.colostate.edu>
Cc: "Miller, Andrew - NRCS, Washington, DC" <Andrew.L.Miller@wdc.usda.gov>, "David,Olaf" <Olaf.David@colostate.edu>
Subject: RE: Nutrient Leaching

Thank you Shaun –

I am glad to hear this is straightforward! When you have a target date in mind, we would love to know it J

Christine Whitley

USDA/NRCS Contractor – Team Vistrionix
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From: Case,Shaun [<mailto:Shaun.Case@ColoState.EDU>]
Sent: Wednesday, March 02, 2016 9:35 AM
To: Jack Carlson <pspicata@rams.colostate.edu>
Cc: Miller, Andrew - NRCS, Washington, DC <Andrew.L.Miller@wdc.usda.gov>; Whitley, Christine - NRCS, Fort Collins, CO <Christine.Whitley@ftc.usda.gov>; David,Olaf <Olaf.David@colostate.edu>
Subject: Re: Nutrient Leaching

Jack, et al,

No problem adding this code. It looks very straight-forward. I would think this wouldn't take more than 1-2 days.

We need to clarify however:

- If NutrientSLP (WQM-05) needs to have these changes for any and all input cases, or just those coming via WQM-21 (i.e. Any calls to WQM-05 or just WQM-02 output sent into WQM-05 via WQM-21).
- Also, not all WQM-21 inputs require a stop-over in WQM-02, so for those cases where WQM-21 is being called to chain WQM-05 with WQM-06 minus WQM-02, we need this value specified in the input JSON, or if that is not desired, then we would send this only when WQM-02-05-06 is the desired chain from WQM-21, however, this introduces the problem of not having this value in WQM-05 when it is called outside of the WQM-21 (02/05/06) chain...

Thanks,
Shaun.

From: Jack Carlson <pspicata@rams.colostate.edu>

Date: Wednesday, March 2, 2016 at 9:22 AM

To: Shaun Case <Shaun.Case@ColoState.EDU>

Cc: "Miller, Andrew - NRCS, Washington, DC" <Andrew.L.Miller@wdc.usda.gov>, "Whitley, Christine - NRCS, Fort Collins, CO" <Christine.Whitley@ftc.usda.gov>, "David,Olaf" <Olaf.David@colostate.edu>

Subject: Re: Nutrient Leaching

Shaun,

Please add this item to the top of the to-do list, and could you provide a rough estimate of the time needed to make and post the change? This has priority with the map-unit fix relative to other CDSI-related workload (GRAS, etc.).

Also assume we'll discuss the tracker issue at this afternoon's dev meeting.

Thanks.

Jack

On Mar 2, 2016, at 9:12 AM, Whitley, Christine - NRCS, Fort Collins, CO

<Christine.Whitley@ftc.usda.gov> wrote:

Hello Jack –

Having discussed this update to Soil Leaching Potential with Aaron Lauster, he indicates that this would be a high priority fix prior to the initial release of RS.

Basically if we don't adjust the SLP for the first release, and then adjust it afterwards, any results from the first release will change when the second release comes out – something to be avoided if possible.

That said, the change you are already working on to handle the missing-map-unit issue is at least equally important and we don't want to stop that.

So, when are we getting the missing-map-unit-fix, and how long would it take for you to also provide this NEW request below?

Aaron is basically saying – we need this change below... unless it turns out to extend our release date unreasonably.

Please advise of the likely availability – we would like this fix if possible.

I do understand that you guys are performing wonderful feats for the RS project AND BEYOND... and we all appreciate it immensely.

- Christine

Regarding Trackers – I have entered trackers in our CoLab for this, but your team won't have access to this area, will they? I know you have your own CodeBeamer site though. Any suggestions as to how we could have tracker visibility on both sides for this? It would be very nice to have this, agree.

From: Hesketh, Eric - NRCS, Amherst, MA
Sent: Friday, February 19, 2016 4:33 PM
To: Jack Carlson <pspicata@rams.colostate.edu>; shaun.case@colostate.edu
Subject: Nutrient Leaching

Jack and Shaun:

I have a few small changes to the nutrient leaching logic. I tried to make it as similar to pesticide leaching as I could, but it looks like it won't work. Hopefully the changes will be easy to implement.

Unfortunately, we need to return a value from the soils service WQMSoilAttributes. Fortunately, it's already calculated.

We need to output the wtbl_top_min so It can be passed to Nutrient SLP.

In Nutrient SLP:

- 1) Leaching will be set to “high” if the wtbl_top_min <= 76 cm AND the water table kind is apparent. (Hwt_lt_24 is no longer used for nutrient leaching)
- 2) Drainage has no effect on the leaching rating.
- 3) For nutrients Water table will be set via soils data wtbl_top_min <= 76 cm AND the water table kind is apparent, there will be no allowance for the user to set the water table in any other way.
- 4) Dual hydrologic group soils receive a “High” because drainage will not be taken into account.

There is no change in the current code for “Histosols”.

Eric Hesketh

Technical Contact/Developer WIN-PST
Soil Scientist/Pest Management Specialist
Water Quality and Quantity Team, WNTSC
Amherst MA, 01002
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<http://go.usa.gov/Kok>

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