

RUSLE2

what you may not have been told

The Monthly Dirt

A monthly newsletter on the California Construction General Permit

An opinion article from The Monthly Dirt Editor

Background:

One might say that RUSLE2 had its origins in the aftermath of the great American environmental disaster of the 1930s - the Dust Bowl. As a result of this national catastrophe, the United States Department of Agriculture (USDA) and the Natural Resources Conservation Service (NRCS) were founded to promote sustainable agriculture and soil conservation practices. We owe much of what we know about erosion and sediment control to the USDA and its programs to assist farmers over the last century. To help quantify soil loss, the Universal Soil Loss Equation (USLE) was empirically developed through years of field

Being old enough to have experienced the computer technology age from nearly its inception, I am constantly amazed at how it has changed our everyday lives. I do not miss the days when you had to find a pay phone and some loose change to make a call while out and about, or using the labyrinth of map pages in a Thomas Brothers guide book in order to arrive at a new destination. In many ways technology has made our lives easier and more efficient. But has it made our lives better? Sometimes, nostalgically, I wish that I wasn't so tethered to my phone, Wi-Fi, and a world of apps. Now don't get me wrong, technology is fantastic in many ways and is here to stay. But I have this nagging feeling that perhaps we humans have developed too much dependency on it and may be in danger of forfeiting our own cognitive prowess. Into this jumbled mess of feelings and thoughts about technology enters RUSLE2 in the form of compliance requirements in the 2022 Construction General Permit.

observations and measurements. It was eventually revised and became known as the equation which we extensively use today for construction SWPPP planning - the Revised Universal Soil Loss Equation (RUSLE). Similarly an equation for sediment yield was also developed - the Modified Universal Soil Loss Equation (MUSLE). In 1993, the USDA Agricultural Research Service, the NRCS, and the University of Tennessee developed a computer program that would accept field and crop-specific inputs and generate RUSLE and MUSLE outputs in the form of soil loss expressed in tons/acre/year and sediment delivery (yield) in tons/acre. The new software became known as RUSLE2 and has continued

focused. However, in 2011 Caltrans released a version of RUSLE2 that was enhanced for construction practices (or at least those practices performed on highway projects). The original Caltrans version was updated in 2012 which drew the interest of many storm water professionals. In fact, I presented an in-person workshop featuring RUSLE2 during the 2014 Storm Water Awareness Week event. However, sometime between 2014 and 2025 the Microsoft Windows-based Caltrans version of the software became unstable and ceased to operate properly. (While I don't know why exactly this occurred, I suspect that it was no longer fully compatible with newer versions of Windows). In January 2025, Caltrans removed the RUSLE2 download feature from their website and posted a message that they were working on a newer version which would soon be made available.

Renewed Interest in RUSLE2:

I, probably like many of my storm water colleagues, only recently discovered that the Caltrans version of the software was no longer functioning. This was due to several factors. The first being that, although there was considerable initial interest in the software when Caltrans first

to be extensively used, tested, and updated to this very day for the agricultural industry. It is open source freeware that is housed on and downloadable from a [Purdue University website](#). While the 2008 updated version contains some construction-related features, it continues to be predominantly agriculture



released the construction oriented version, after dabbling with it, we found that the results produced from the program were what we, as storm water professionals, already intuitively expected. We discovered that we could get the same, if not better, results using the manual calculations with more refined and detailed inputs than we could incorporate into RUSLE2. Therefore, it got set aside as do many other novelty apps. Then onto the compliance scene arrives the 2022 CGP with three distinct uses for RUSLE2. As such, the Construction General Permit Training Team (CGPTT) mandated instruction about the software in the QSP/QSD prerequisite training and the new QSP/QSD training curriculum to be used by CASQA-approved Trainers of Record (ToRs). Seeing these new training requirements, I decided to brush up on the software which was when I discovered it to not be functioning. I spent dozens of hours trying to get it to work. I reloaded the older Caltrans software versions. I tried populating them and the USDA version with different construction-based databases. I signed up for and attended RUSLE2 workshops and classes that were being offered in our industry. But they provided no answers or new insights and the training stopped at exactly the place where I was encountering a roadblock. In my desperation, while attending a January 2025 forum by the CGPTT for ToRs on the proposed new CGP curriculum, I spoke up and shared my frustration with RUSLE2 and asked if anyone was able to get the software to function properly. To this inquiry, I got no response; not then or in the subsequent days and weeks. Finally in February 2025, I was able to connect with the project manager for the Caltrans team that was updating the software. He graciously provided me a beta version of the updated software which I found to function as it had in 2014. This month Caltrans rolled out the finalized version which is now available for download on their [website](#).

RUSLE2 as a CGP Compliance

Tool: While we have been using this software fairly successfully in our now-approved QSD prerequisite course, [The Connections Course](#), and are incorporating it into the new CGP curriculum, we have learned that it is very much the same tool that we dabbled with in 2014. The software in its current form has some significant limitations, of which we are not hearing very many individuals talk about in our industry. Now please don't misunderstand me, Caltrans has done a great job of updating the software and is graciously offering it free of charge to the California storm water industry.

A MONTHLY DIRT SPECIAL

video interview



But Caltrans primarily performs highway construction for which the tool is presumably well suited. I have found that while using the USDA version is like shoving a square peg into a round hole, using the Caltrans version for non-roadway projects is akin to putting an octagon peg into the hole - it's a better fit, but not a great fit. For example, there are no management practice input options for buildings and other infrastructure features typically present on commercial or residential projects.

In spite of Caltrans' generosity in providing us with a copy of the software, their agency did not by default sign up to be the State-wide RUSLE2 tech support resource. In fact, there is no technical support for RUSLE2 users outside of Caltrans projects. That's a big problem that no one seems to be talking about either. Since the CGP requires the use of RUSLE2 but doesn't specify a specific software version or provider, what is preventing techy users from making improvements of their own to the open source freeware? This could range from upgrades by scholarly experts with honest intentions to some rather nefarious under-the-hood manipulations by those needing post-construction values to equal pre-construction values. Who would even know the difference? Such manipulations may not be ethical but, because of the lack of clarity in the CGP, they most likely would not be illegal.

Notwithstanding, I have been using the latest Caltrans version for demonstration examples for the final stabilization, vegetative buffer, and TMDL CGP requirements. My experience with the software is revealing that it is not always feasible to obtain RUSLE2 outputs that meet the permit's requirements even though I know from years of first hand professional

experience that the proposed BMPs are more than sufficient to comply with the permit and meet the water quality goals. Trainer David Franklin of EnviroTech NPDES Services and I teamed up recently on a [podcast](#) in which we delve into some of the technical issues we have encountered while using RUSLE2 for which we feel need further clarification from the Water Board and/or storm water industry.

The Magic Black Box Myth:

Perhaps those who wrote the RUSLE2 requirements into the permit have had a much different experience than I have had with the software. (I will readily admit that I am no RUSLE2 expert but rather someone who has been trying to muddle my way through these new requirements.) But with the lack of any experts stepping forward, I have to wonder if my experience is all that unique. I understand the appeal of a magic black box into which we input data and out pops a result indicating if we are in compliance with the CGP. But from my somewhat limited experience and perspective, that box doesn't exist (at least not yet.) Technology is wonderful and is always evolving but, as professionals, we need to be cautious about relying so heavily on new and relatively unproven technologies rather than using our own professional knowledge and skills to provide reliable and time-proven results.

Please contact us if you have any questions ... The Monthly Dirt

Newsletter Editor:

John Teravskis, QSP/QSD, CPESC, CESSWI, WPCM, ToR
jteravskis@wgr-sw.com (209) 334-5363 ext. 110
or (209) 649-0877

Technical Questions about Environmental

Compliance? Contact...

Matt Lewis, QSP, CESSWI, WPCM
matt.lewis@wgr-sw.com,
Rebekah Burnett, acting editor
rburnett@wgr-sw.com

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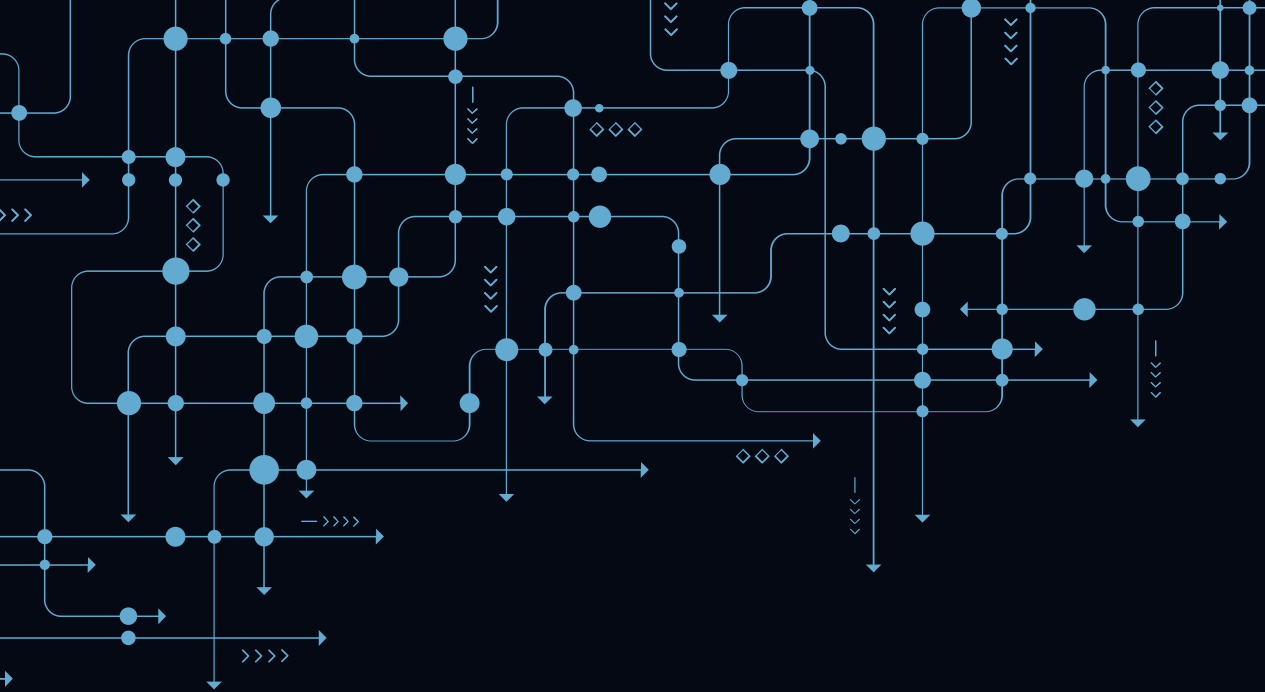
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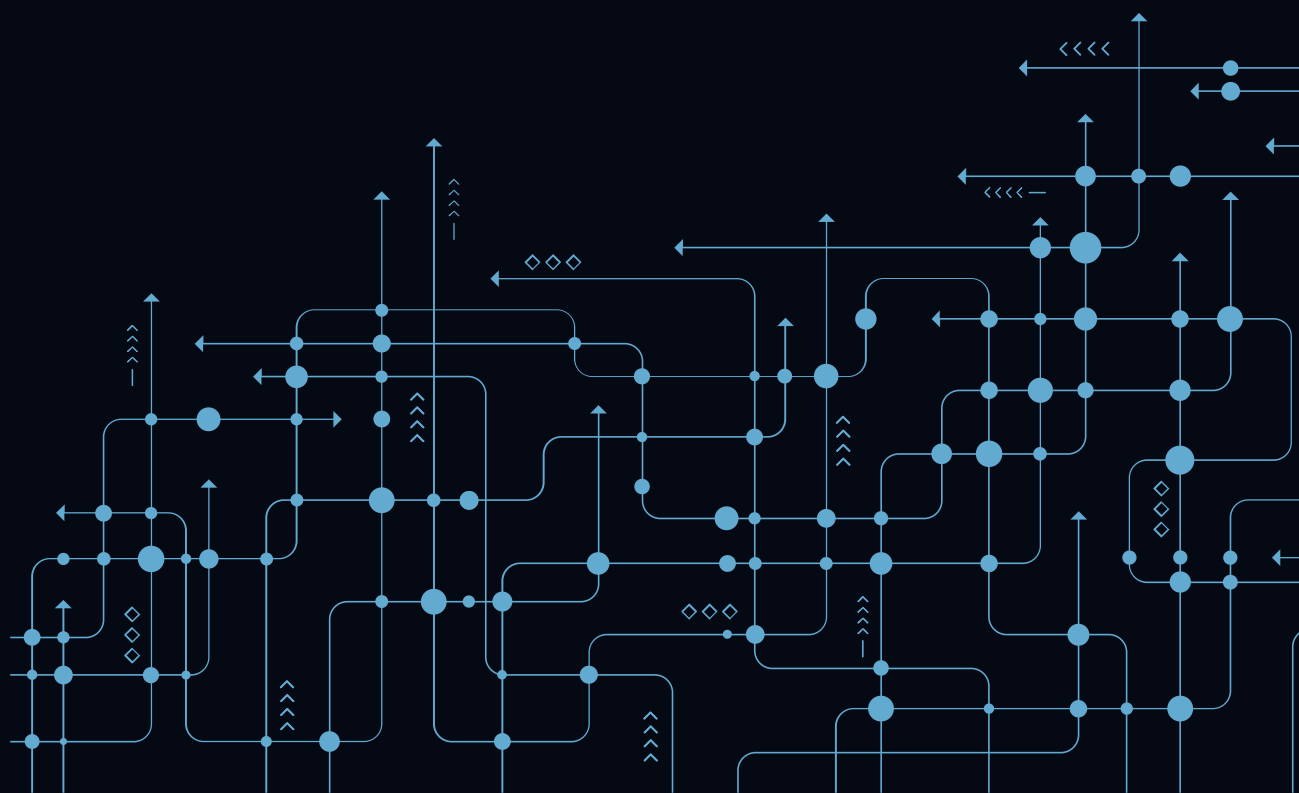




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