

17 July 2015

Hello All,

We look forward to seeing you at the upcoming short course – not much more than a week away! Here is some information to help you get prepared.

### **Key items**

- \*\* Bring a laptop. Install HEC-RAS on it. Learn the basics of RAS. Detail below.**
- \*\* Bring something to walk in streams. Sport sandals, river shoes, old sneakers are good. Waders OK but not essential.**
- \*\* *Do homework before class. Really. It will make a huge difference in what you get out of the class. We're not kidding.***

### **What to Bring**

We will have field trips on four days of the course. It can be quite hot and sunny (upper 80s and 90s), so please bring sun protection. Beverages will be provided but we encourage you to bring a water bottle. For the field trips, please bring clothing and shoes that you can get wet (e.g. shorts and sandals). We'll be wading in streams. It cools down in the evenings, so you may want to pack a light jacket. It probably won't rain, but we are in the mountains, so you never know. Especially this year.

### **Course Location**

The course will meet in the Merrill-Cazier Library (the main library) on the USU campus. The classroom is near the front entrance of library, which is on the east side. If you need to park, the nearest garage is northwest of the library (the big blue terrace). If you are staying at the University Inn, it is between the library and the parking garage. More location information and maps at the course website <https://cnr.usu.edu/streamrestoration/htm/course-information/sediment-workshop-logistics/>

### **Course Schedule**

The course begins bright and early at **8:30 am** Monday-Thursday. On Friday, we will meet at **7:30 am** because we have a long trek down to the Provo R. On Monday, please arrive at the Library by 8:15 or so, so we can get started on time. There will be coffee, juice and light snacks available throughout the day to help keep your energy and blood-sugar levels up. We will provide lunch on four days and dinner on Monday and Wednesday evenings. Tuesday and Thursday evenings there will be homework and you will be on your own for dinner.

On **Friday**, we will be traveling to the Provo River Restoration Project in the Heber Valley and will be finished in the afternoon about 3:30. The Provo Project is about an hour from the Salt

Lake City Airport. You can easily plan on flying out that evening, if needed. A flight after 6:30 should work. In the past, participants with their own vehicles drive them to the field site and leave straight from Heber Valley. We will arrange a ride to the airport if you need one. There will also be vehicles going back to Logan.

### **What about you?**

If you have a particular sediment or stream restoration problem, we would love to hear about it in advance. Describe it in **a page or less**, send a few images. Where is it? What are the key concerns, goals, objectives? Are there aspects that make this project unique or less straightforward from an assessment or design perspective? Are there specific problems/questions you are grappling with? We can talk about it during drive time or in the evening, and maybe we can point out connections during class. I can assure you that we will *not* be reading big project reports between now and the class, so package (market) the challenge in a page or less for maximum interest.

### **Preparing for the course ... homework!**

In planning the course, we always face hard decisions about what to include as well as how much. The most important thing is that you develop a strong, flexible, and robust understanding of those parts that are most important to you. For 99% of you, your best chance to do this is to study some of the material *in advance*. Seriously. Time spent *in advance* will amplify the benefits you get from the course. Instead of glancing at what flies by in class, you will be able to engage with it, make connections, and make it your own. We could teach much, much less in the class, go through it very slowly, and ensure that everybody leaves with a few basic points. We aim a bit higher, because we want to provide enough material to enable you to build on basic concepts with insight, understanding, and confidence. The only way this can work is if you do two things *in advance*: understand some vocabulary and concepts and familiarize yourself with some of the software we will be using.

Important elements of the course include water and sediment supply, hydraulics, and sediment transport. Questions we will be asking include: How do we estimate sediment supply to a stream reach? How do we estimate flow and transport in streams? How do we use those estimates in stream channel design? All this stuff will be covered in class, but the pace will be quick. If you are seeing it for the first time in class, your ability to really use the material, *to make it your own*, is likely to be pretty limited. If you come prepared, you can spend more of your time at the course understanding how this technical material is used in stream restoration.

**(a)** We will use HEC-RAS to calculate flow profiles in existing and design channels. Some will be familiar with RAS; the rest can easily develop sufficient familiarity in advance. Here's how:

Download HEC-RAS. Follow download instructions at <http://www.hec.usace.army.mil/software/hec-ras/>

Install RAS. Launch RAS.

With RAS running, you will find the documentation under the Help menu once you launch RAS.

You should work through Chapter 5 (Working with Projects) of the User's Manual. You should also launch the project "Critical Creek" (the first project in the Applications Guide) and poke around.

Again, we WILL be using RAS in the design exercise. We will also spend Tuesday afternoon doing a RAS-based exercise. If you have not used RAS, you can get up and running and become competent ... if you get rolling before class. *Estimated prep time: one to two evenings*

**(b)** We will be working on how to develop estimates of sediment supply. Be sure to read Grabowski et al. 2014 for background on the basic concepts, analyses and available datasets. *Estimated prep time: one evening*

Grabowski, R. C., Surian, N., & Gurnell, A. M., 2014. Characterizing geomorphological change to support sustainable river restoration and management. *Wiley Interdisciplinary Reviews: Water*, 1(5), 483-512.

Many of you will be familiar with the basic concepts, but the following three readings are optional for those of you who would like to brush up or read about certain topics in more detail.

Brierley G.J., Fryirs K.A., 2005. *Geomorphology and River Management: Application of the River Styles Framework*. Blackwell Publishing: Malden, MA, USA; 398 pp. (Chapters 8 and 9)

Davies, T.R.H. and O. Korup, 2010. Sediment cascades in active landscapes. Ch 4 in Burt, T.P., Allison, R.J. (Eds.), *Sediment Cascades in the Environment: An Integrated Approach*, Sediment Cascades. John Wiley & Sons, Ltd, 472 pp.

Naden, P.S., 2010. The fine sediment cascade. Ch 10 in Burt, T.P., Allison, R.J. (Eds.), *Sediment Cascades in the Environment: An Integrated Approach*, Sediment Cascades. John Wiley & Sons, Ltd, 472 pp.

**(c)** We will be working on measuring and calculating sediment transport. Everything you need to know is in a primer (Wilcock et al. 2009) published by the USFS STREAM team. You should read it through before class (particularly Chs. 1, 6, 7).

*Estimated prep time: one to two evenings (of course, you won't be able to put it down)*

Wilcock, Peter; Pitlick, John; Cui, Yantao. 2009. *Sediment transport primer: estimating bed-material transport in gravel-bed rivers*. Gen. Tech. Rep. RMRS-GTR-226. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 78 p

## **Computers**

We will be doing hands-on activities and you should bring a laptop. (If you are not able to bring a laptop, please let us know and we will try to arrange one for you.) Here are the software requirements:

(1) Windows OS. For Mac users, **Windows on Parallels or Fusion okay, Bootcamp is better.**

(2) HEC-RAS

(3) Microsoft Excel (If you use a Mac, you should note that some parts of our Excel software use VBA macros. Excel dropped VBA support for MAC in 2008 and then restored it in 2011. Go figure. If you use a Mac, make sure you have a 2011 or later version of Excel, or make friends with somebody using a windows version.)

We will work in groups of 3 on the design project. It will be helpful, but not mandatory, if somebody in each group has MS PowerPoint and ArcGIS or Google Earth. ARC-GIS is optional and we will provide a copy with a 1-yr license, if you are interested.

### **Travel Arrangements**

If you have not made arrangements for travel and accommodations, well, get on it! Logistics information at <https://cnr.usu.edu/streamrestoration/htm/course-information/sediment-workshop-logistics/>

There is a good shuttle from Salt Lake Airport (SLC) to Logan: <http://www.saltlakeexpress.com/>

It is perfectly reasonable to do this whole thing without a car, particularly if you are staying at University Inn (one of their drop-off points). If you do this, we will get you back to SLC on Friday after class.

### **Weather**

We are expecting the weather to be hot and sunny with highs in the 80s and 90s but we can never be sure. Please continue checking forecasts at [www.weather.com](http://www.weather.com) (The zip code for USU is 84322).

### **What to do in the area**

There are tons of outdoors things to do in Logan and around the grater Cache Valley. We won't go into detail - just use Cache Valley or Uinta-Wasatch-Cache National Forest as a search term and you will be in good shape. If you can build in a weekend or two, you can take in desert, red rock, Rockies, Tetons, ...

Peter, Patrick, Tyler