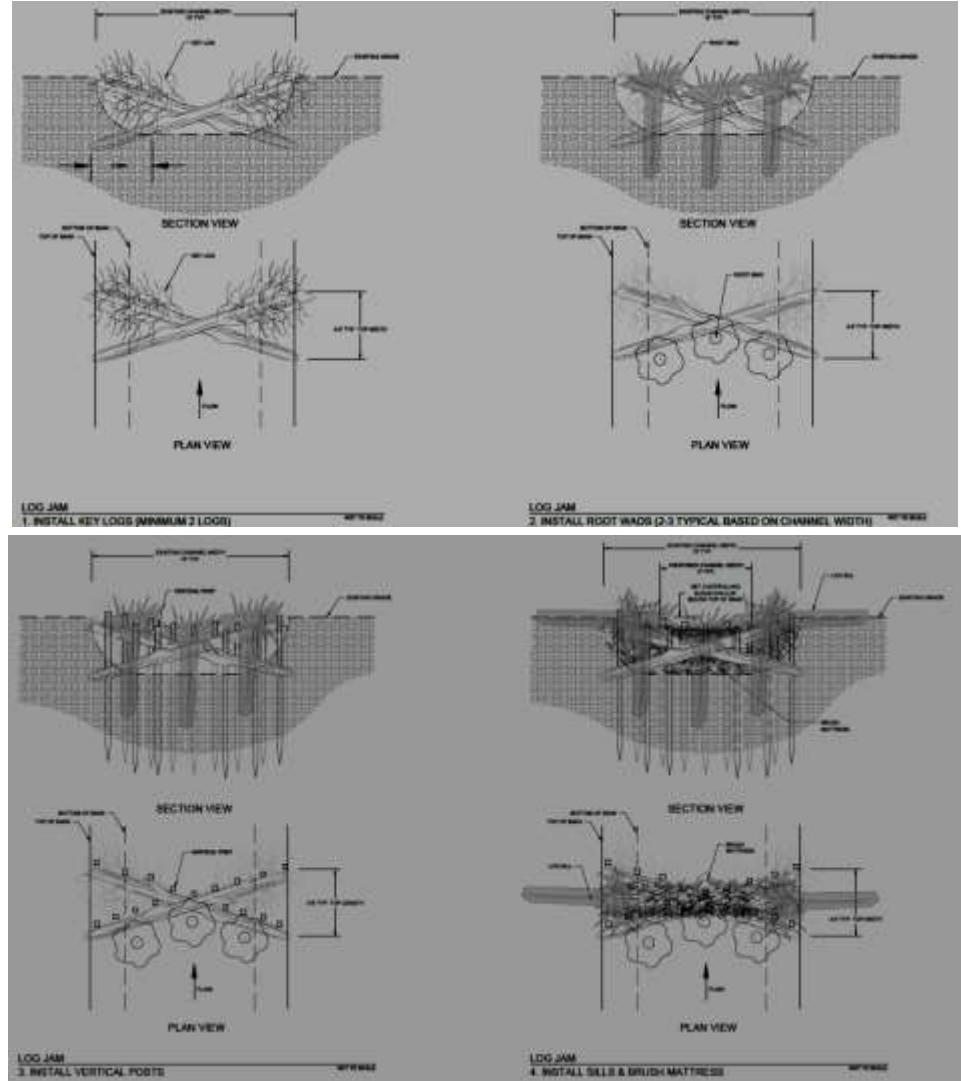


A photograph of a stream restoration project. The stream is filled with water and surrounded by a dense forest. The banks are covered with a layer of brown burlap fabric, which is used to stabilize the soil. Numerous dark, woody branches and sticks are scattered throughout the stream, some partially submerged and some protruding above the water. The water appears slightly turbid. The background shows a lush green forest with tall trees and dense foliage.

# Stream Restoration Using Wood- Not Just for the Coastal Plain!



- ~4,100-lf stream restoration using ~77 wood structures
- 1<sup>st</sup> and 2<sup>nd</sup> order stream channels



## Main Tributary - Middle

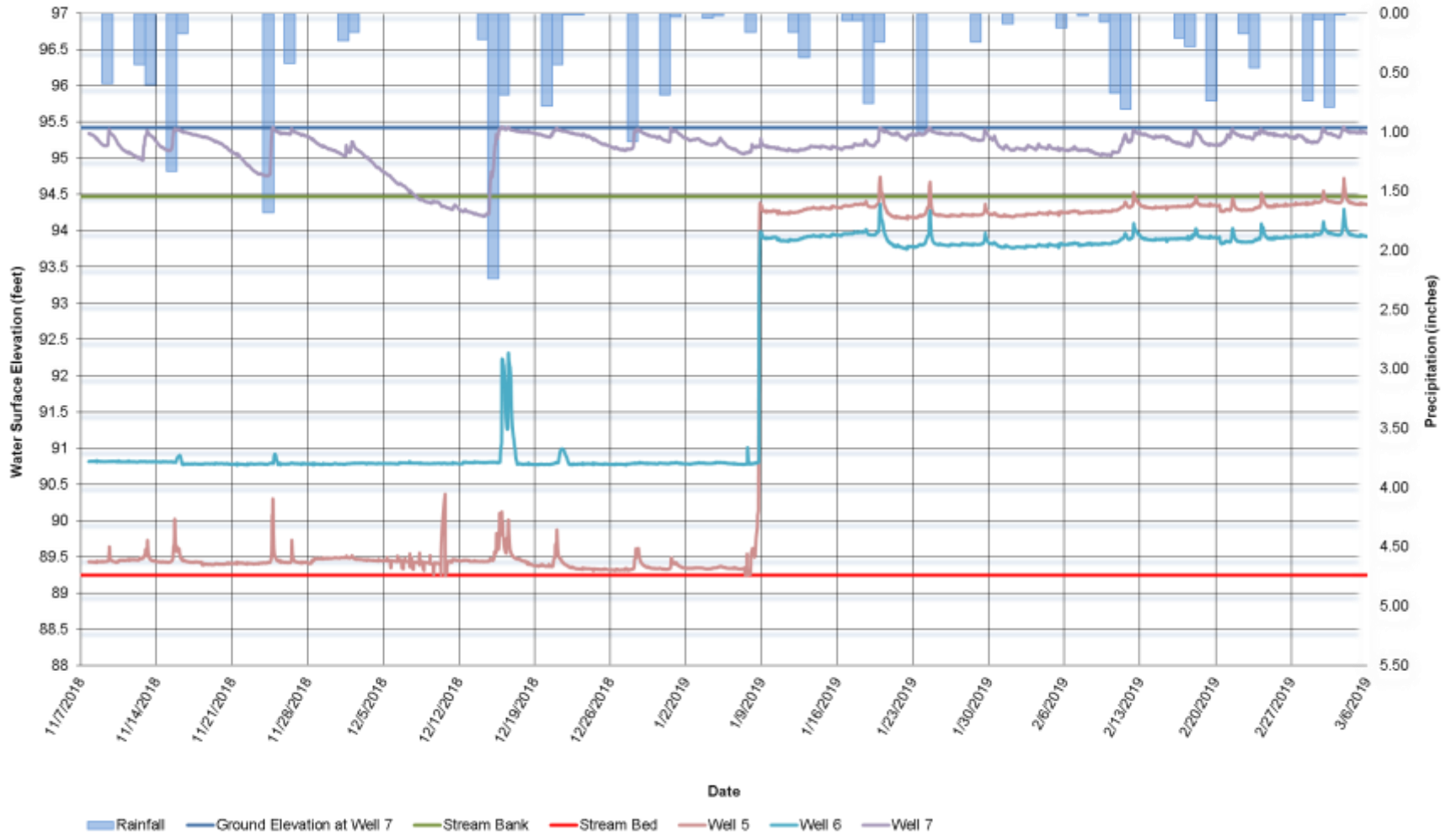


**February 2018**



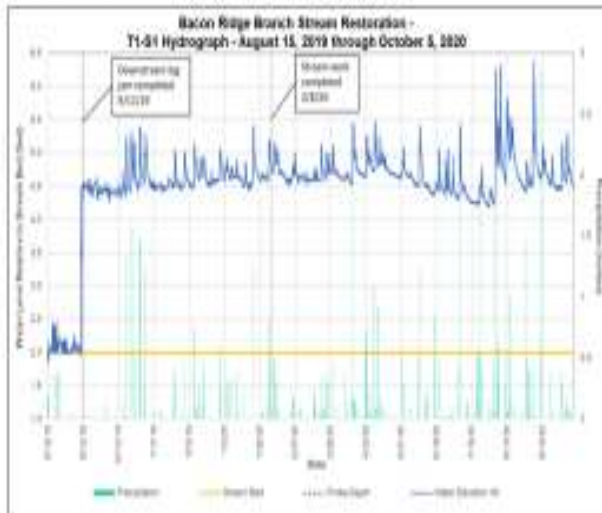
**October 2019**

**BACON RIDGE BRANCH Groundwater Monitoring: November 7, 2018 - March 6, 2019**



# Elks Camp Barrett Hydrographs: Transect 1

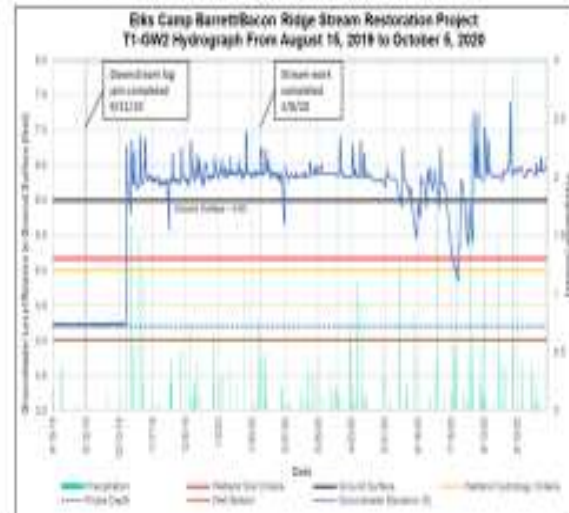
Mainstem Channel



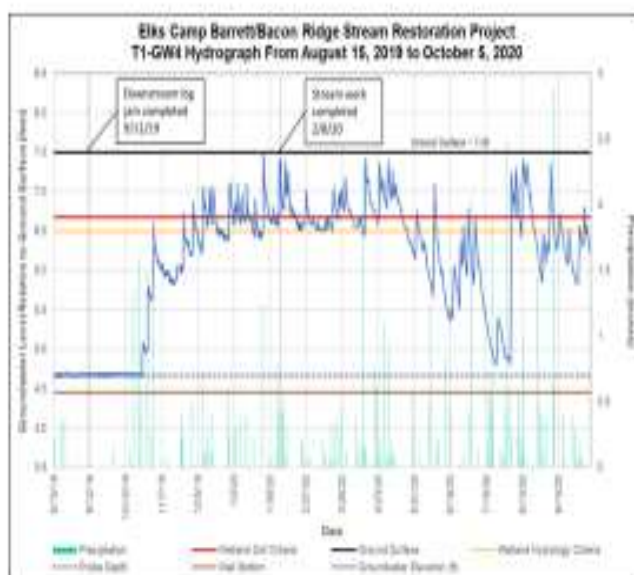
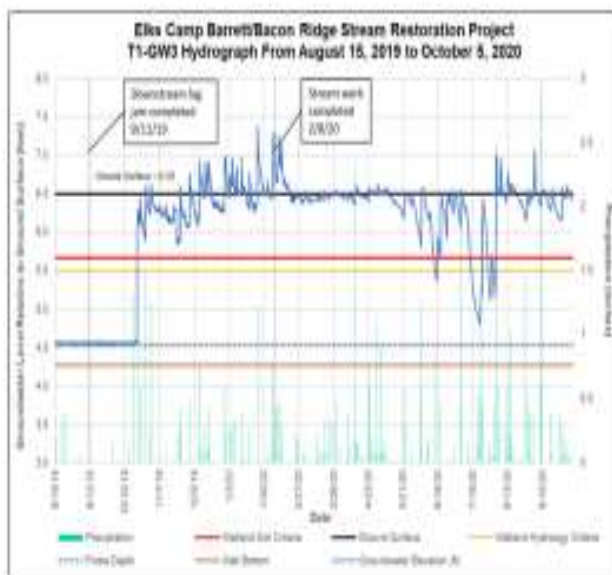
GW1: 50' from Stream



GW2: 100' from Stream



GW3: 200' from Stream



GW4: 300' from Stream

# Progression of Methods for Surface Water Conveyance

Next ?

**Integrated Stream and Floodplain Techniques  
(valley restoration, baseflow channel with floodplain reconnection, etc.)**

**Bankfull Channel Design**

**Rip-rap, gabion,  
Concrete channels**

**Pipe**



**Functional Value**

**Time**



Coastal Plain Outfall  
(Not just for the Coastal Plain)



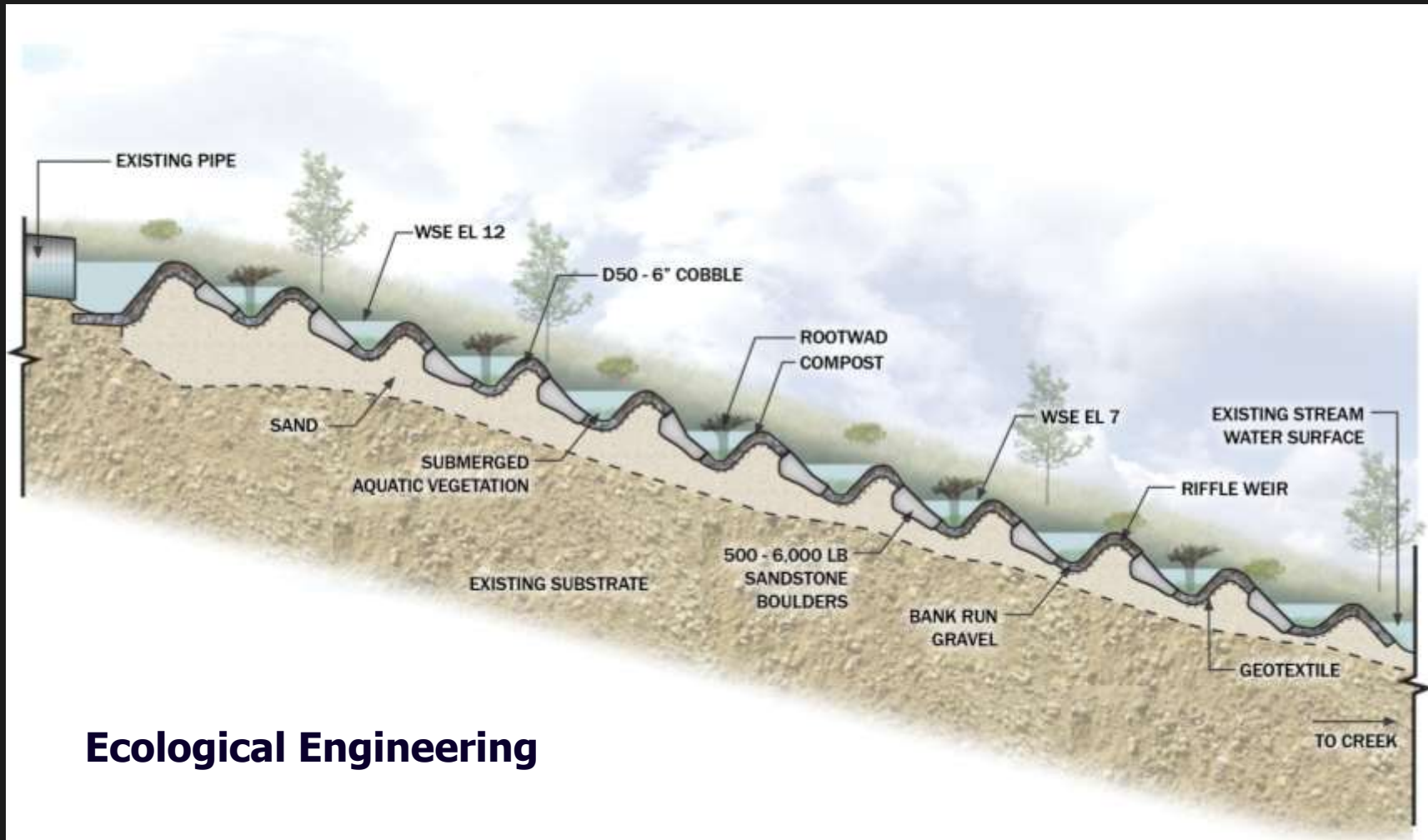
Regenerative Stormwater  
Conveyance



EPA Bay Program Approved  
BMP



# Ephemeral Gully Restoration Approach



**Ecological Engineering**

**Regenerative Stormwater Conveyance**

**Carriage Hills  
Pre-restoration**

**22-ft incised**

**Adverse effect on  
shallow  
groundwater  
and downstream  
flows**





Sand seepage bed

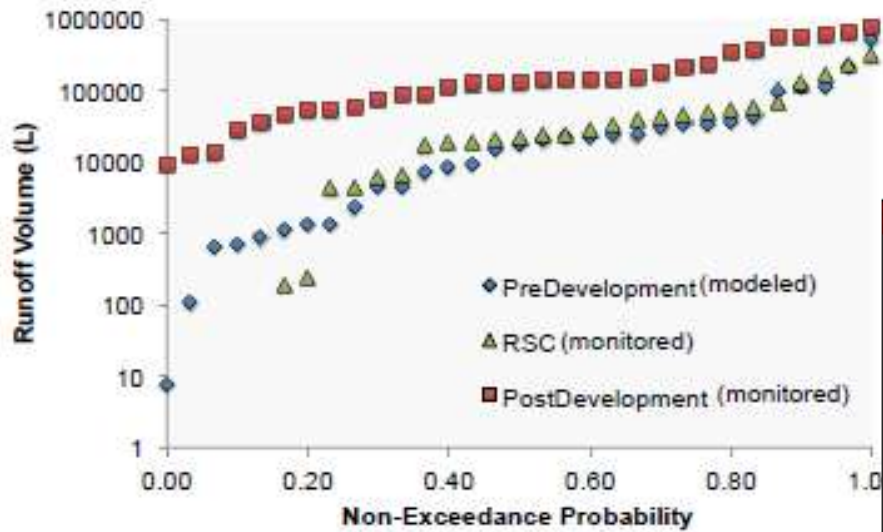


**Riffle Grade Controls**

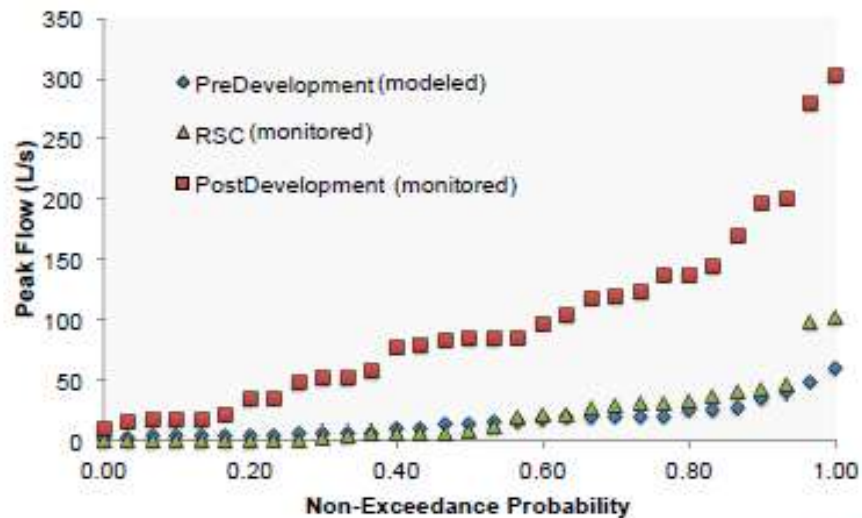
# Carriage Hills Post-restoration

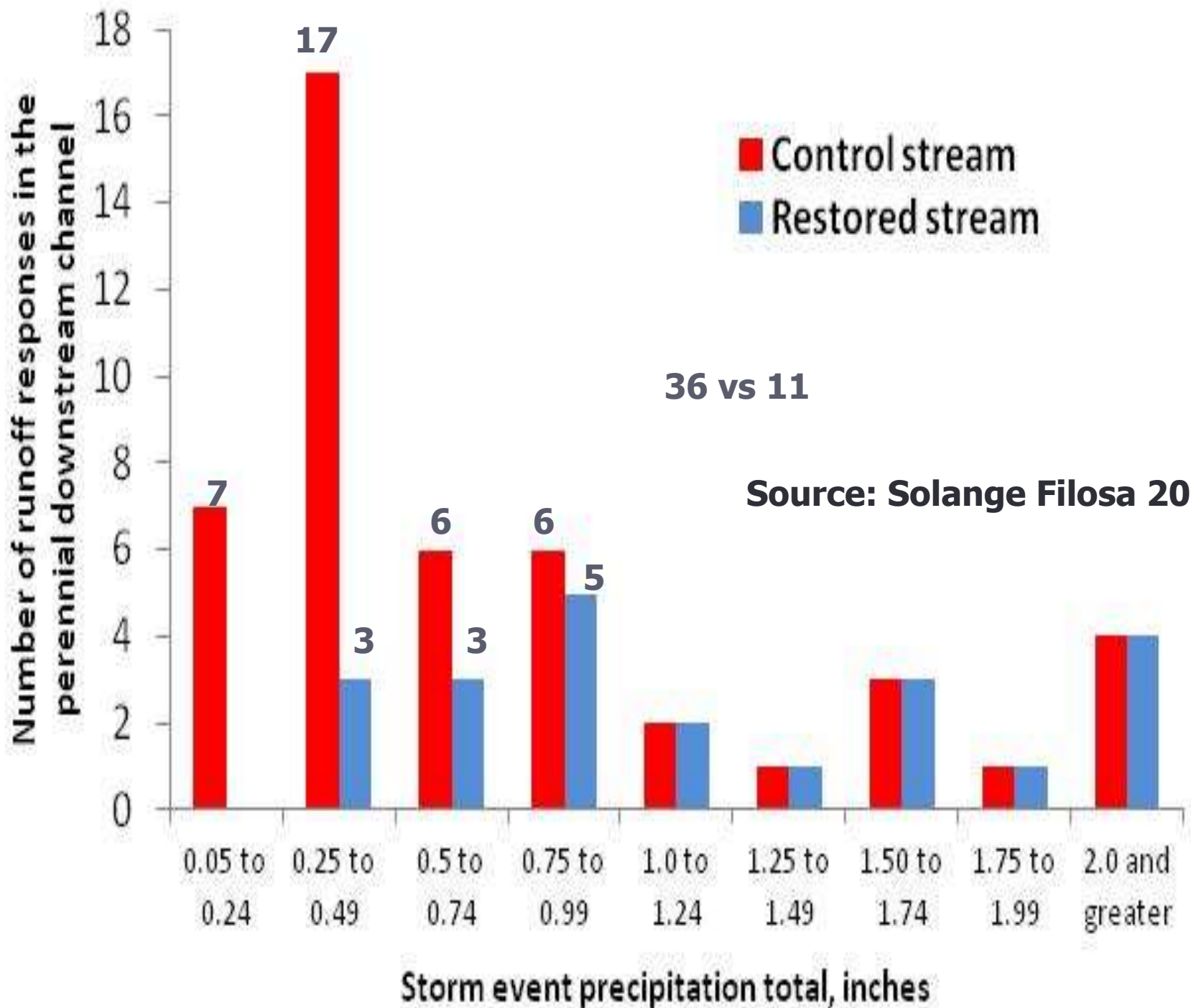


# Runoff Volume

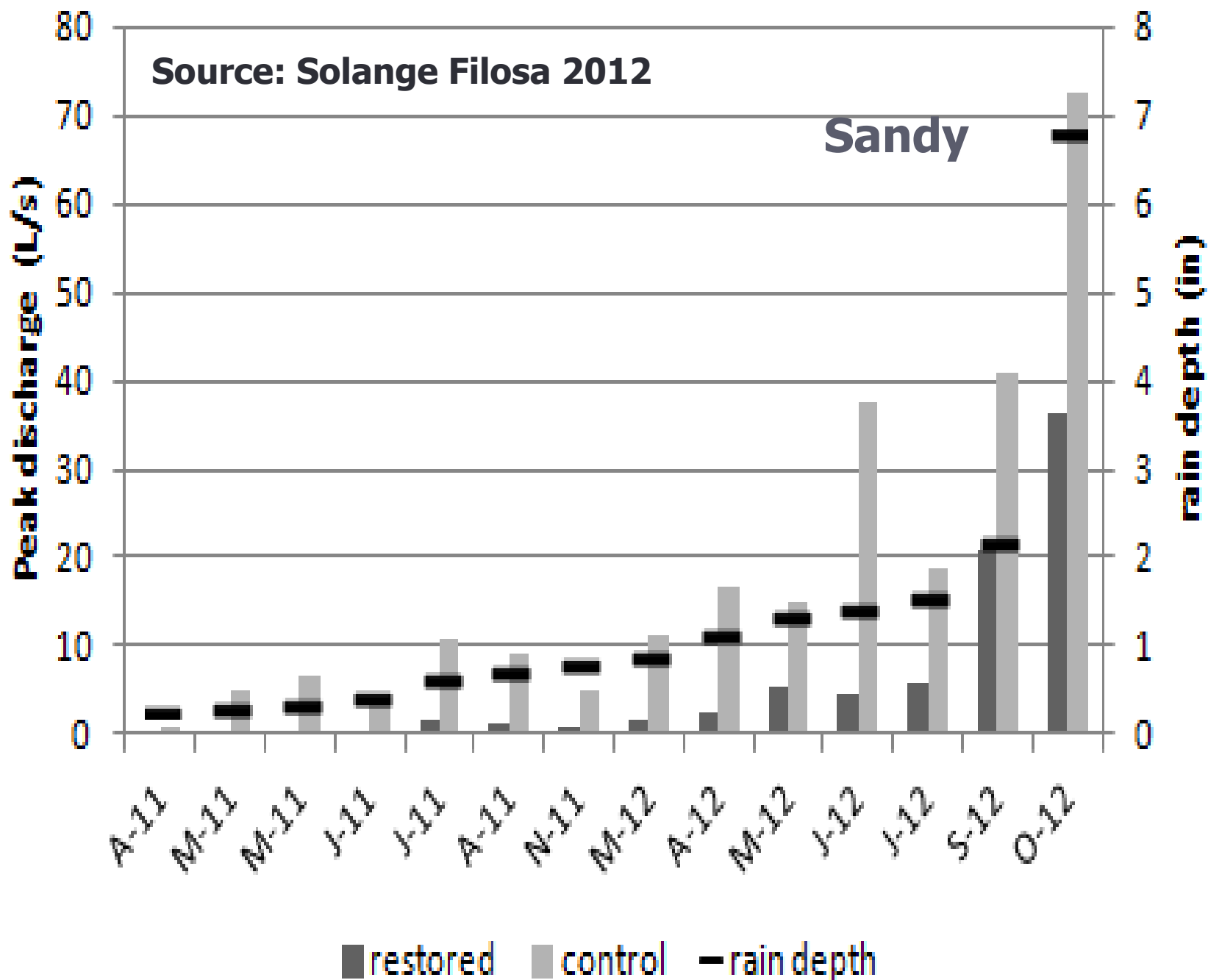


# Peak Flow

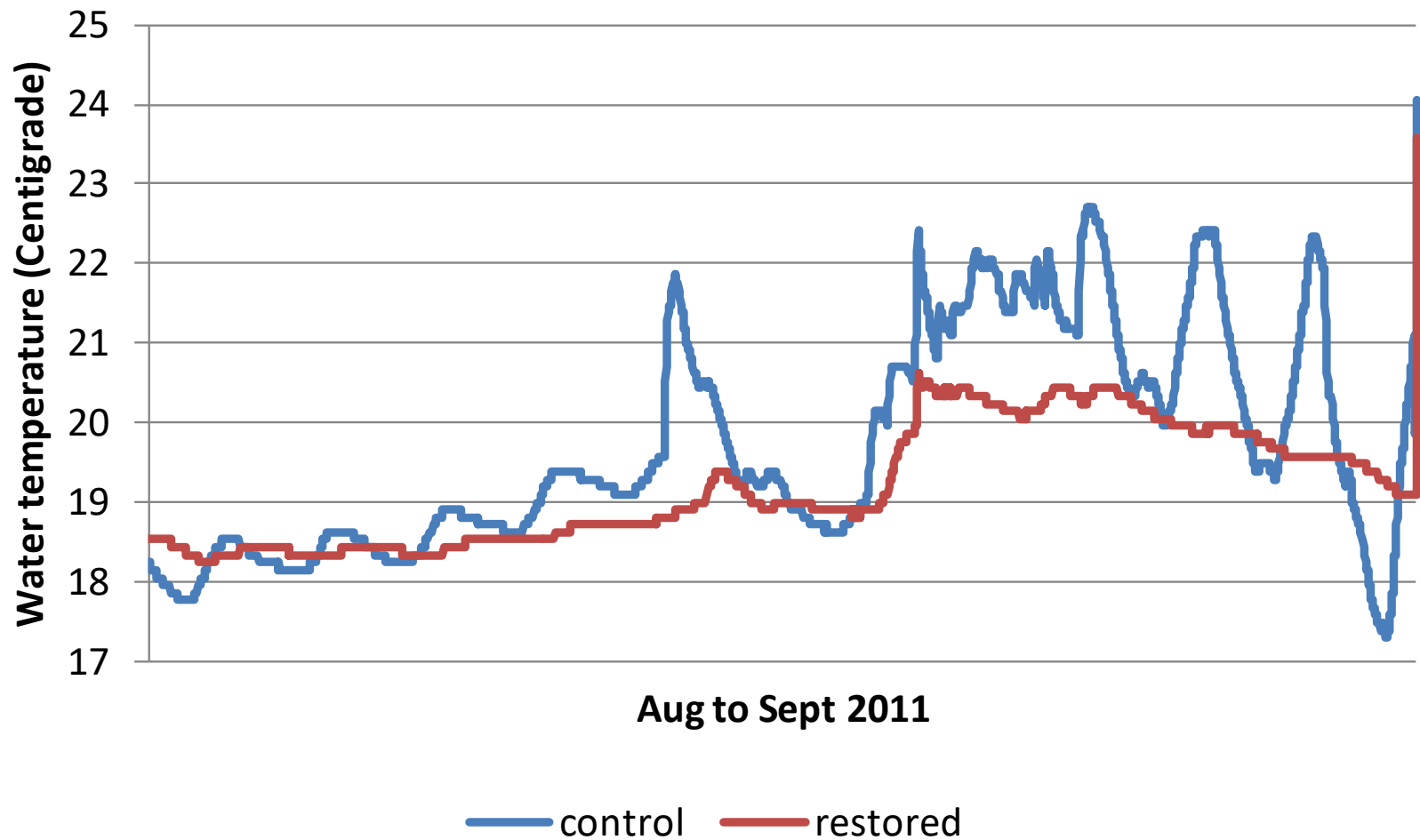




Source: Solange Filosa 2012







**Solange Filoso, University of Maryland Center for Environmental Science, Chesapeake Biological Laboratory**

Questions?

