

Functional Uplift in Stream Restoration

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To Overcome Problems, Need to Agree on Problems

- Increased discharge of surface water leads to channel enlargement
 - Widening and deepening of channel
 - Reduction of baseflow and perenniality
 - Degradation of shallow groundwater
- Development leads to simplified drainage network
 - Conversion of headwater streams to pipes or strait ditches
 - Feedback with channel enlargement propagating downstream
 - Not only has the drainage network, but stream functions have been simplified

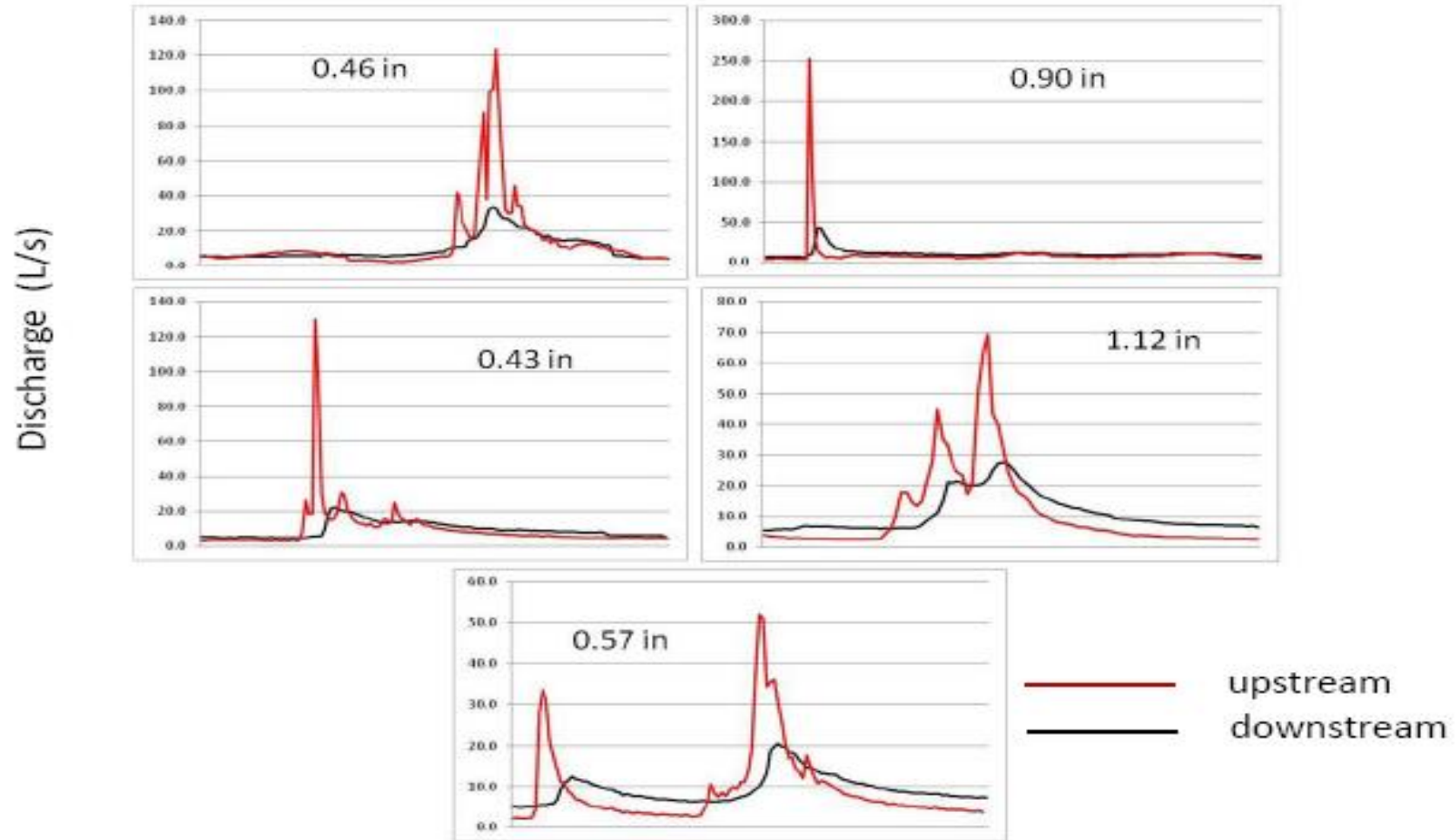
Restorative Efforts Focused on Problems

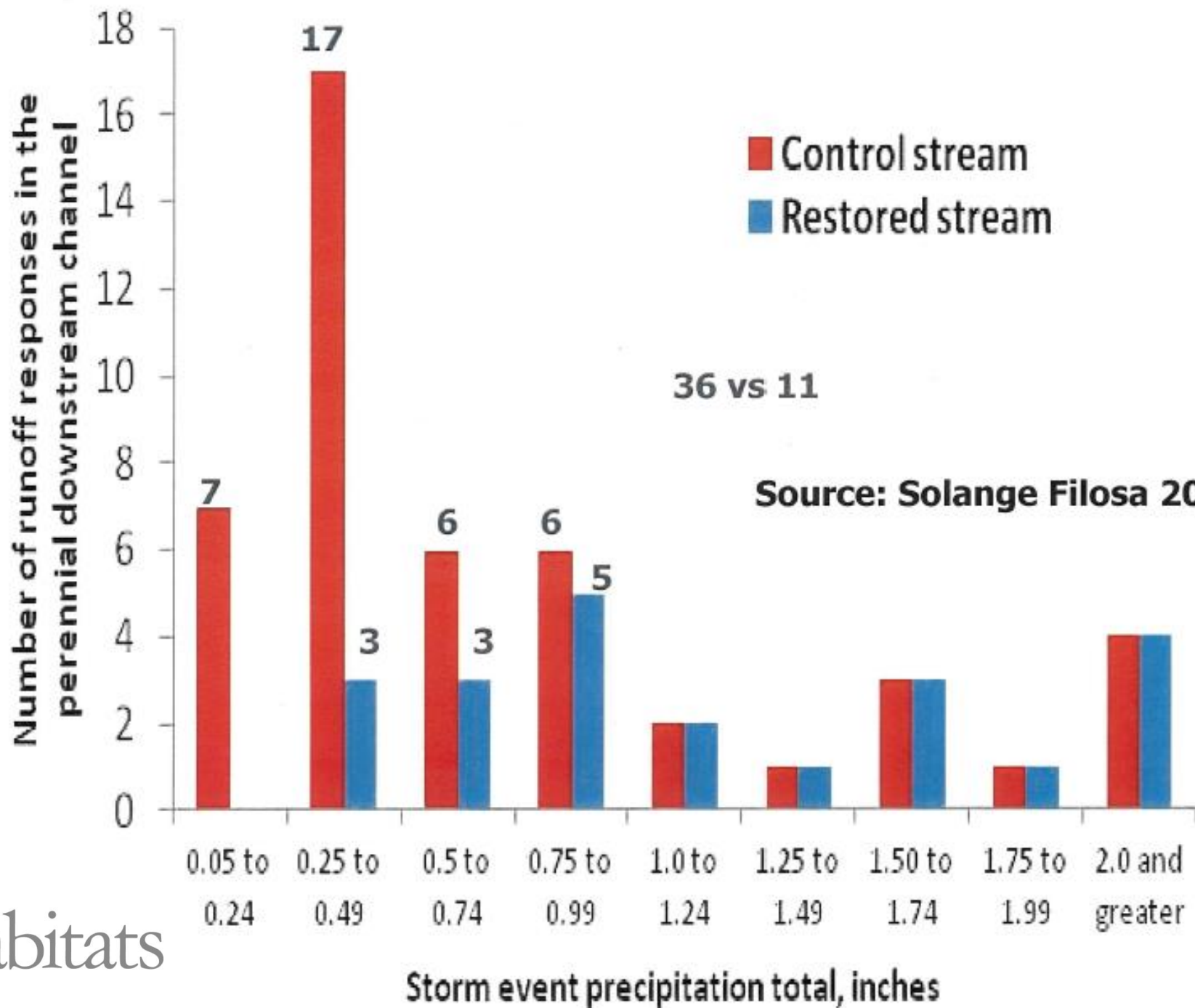
- Restore simplified eroded conveyance channels to complex material processing systems
 - 'Two stage' or bankfull channels aren't a solution
 - If it isn't connected to its floodplain or riparian zone every time we get a ½-inch or less rain, we're not going in the right direction
- Add Complexity to Flow Path
 - Create a profile with areas of 0 or negative slopes along the flowpath
 - Increase friction, 1st order (material roughness) and 2nd order (bed diversity)
 - Add storage along flowpath in oversized pools, floodplain and riparian depressions, etc.
- Extend channel length

Linkages to Functional Uplift

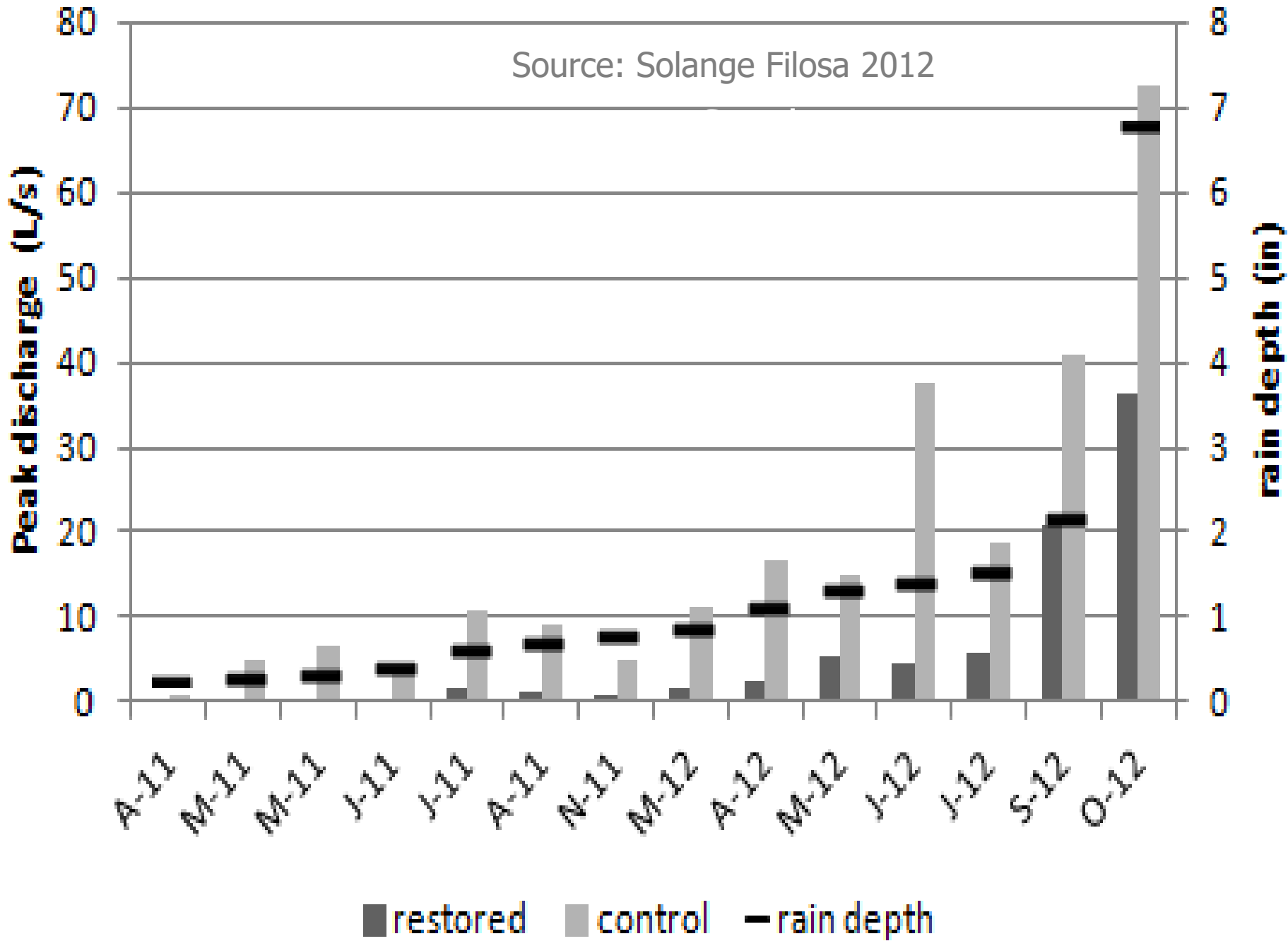
- The efforts on the previous slide WILL contribute to a
 - reduction in peak discharge,
 - increase in time of concentration,
 - rise in shallow groundwater,
 - improved baseflow depth and perenniality,
 - greater surface area & contact time = delivery of water quality improvements
 - increased diversity of instream habitat = improved aquatic habitat
- These benefits will develop in proportion to the length of stream, area and nature of watershed, ability to reconnect to riparian zone

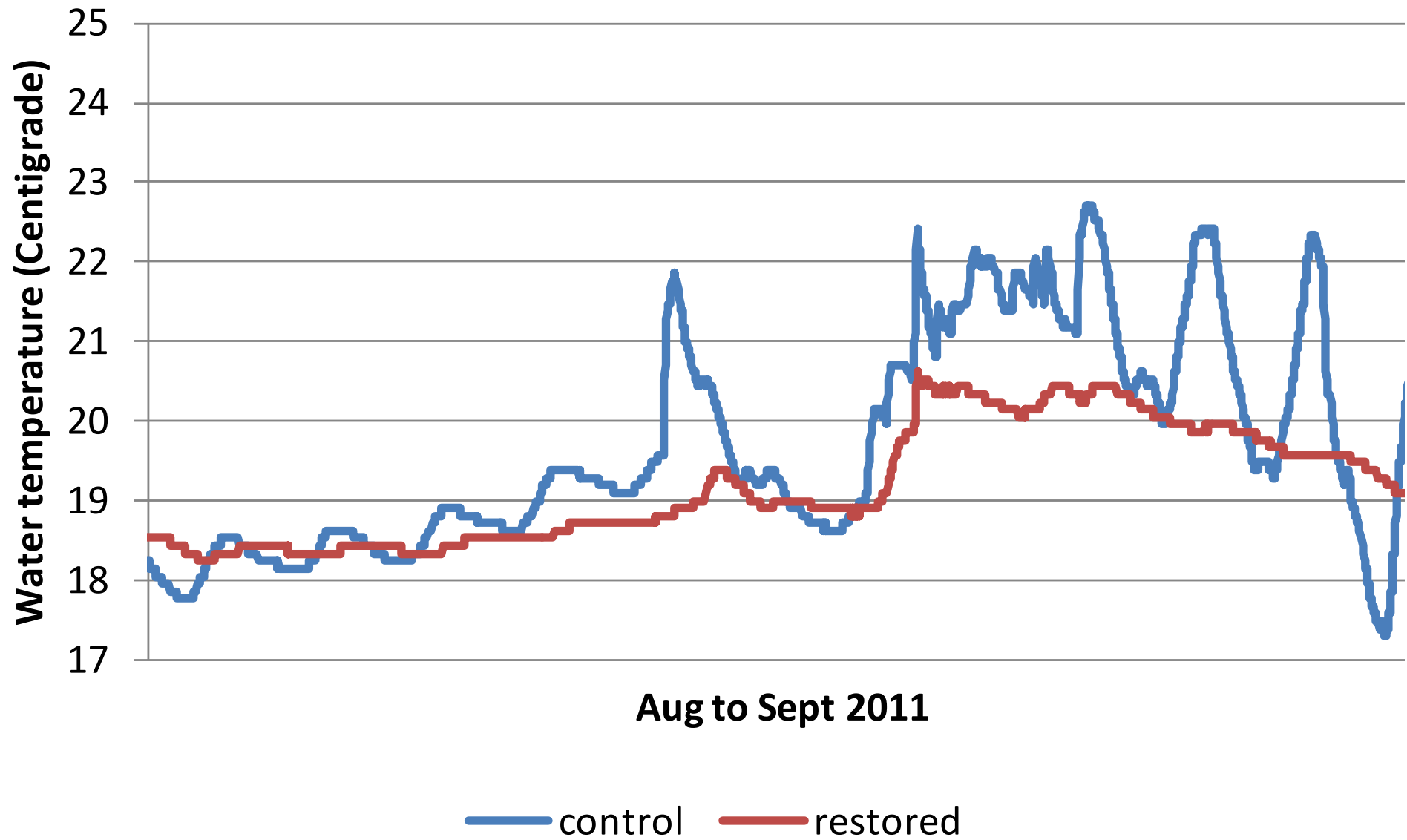
Hydrographs during individual storms WILELINOR





Source: Solange Filosa 2012





Aug to Sept 2011

— control — restored