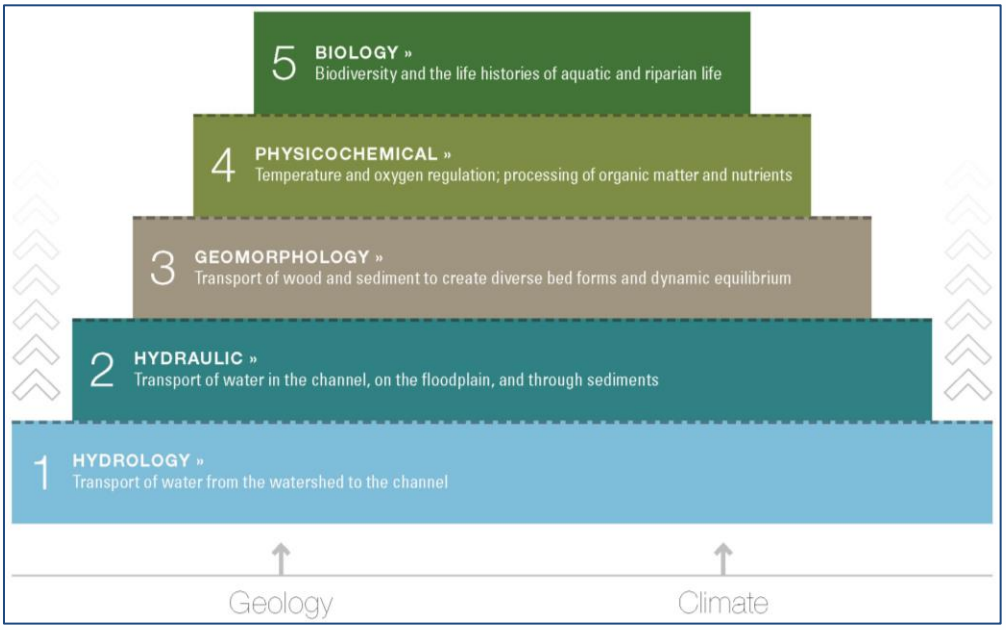
Workshop Stresses Improvement of Stream Functions

Stream restoration has many meanings. Some define restoration as a return to pre-disturbed conditions. Others take a broader approach and define restoration as the improvement of stream functions to a reference condition.

Rich Starr, Chesapeake Bay Field Office, and Will Harman, Stream Mechanics, led a workshop applying the Stream Functions Pyramid Framework (SFPF) to regenerative design restoration (RSC). RSC projects are a relatively new approach to stream restoration and over the past two or three years, practitioners and regulators have been struggling in communicating the benefits of these types of projects. Most of that struggle has been associated with the lack data and when there was data, the organization of that data. EPA-Chesapeake Bay Program recognized the potential for the SFPF to address this breakdown in communication and requested the CBFO to provide training to regulators and practitioners. The goal of the training is to gain concurrence between the two groups on how the SFPF should be applied to RSC projects that could ultimately improve permit review significantly.

The Stream Functions Pyramid Framework provides an organized thought process for developing stream restoration project goals, function-based assessments, and restoration plans. The framework organizes stream functions into a pyramid-shaped hierarchy with higher-level functions supported by lower-level functions.



Hydrology creates the base of the pyramid. These functions determine how much water is produced by the watershed and include measures such as the rainfall-runoff relationship and bankfull discharge determination. Hydraulic functions are next and describe the flow dynamics in the channel and floodplain where floodplain connectivity and flow dynamics are critical measures. Geomorphic functions follow and integrate the hydrology and hydraulic functions to

transport sediment and create diverse bed forms. Once this structure is in place, physiochemical functions can improve, including increased dissolved oxygen, lower stream temperature, denitrification, and organic processing. At the top of the pyramid are the biological functions because they rely on all of the below functions. These functions include the life cycles of fish and macroinvertebrates, riparian condition, and more.

The pyramid can also be used to design monitoring plans that quantify improvements by focusing on improving functions, rather than just channel form. Monitoring can then quantify the improvement or function lift in each of those functions.

About 55 people attended including representatives from Maryland Department of Natural Resources, Maryland Department of the Environment, U.S. Army Corps of Engineers, Anne Arundel County, Baltimore County, Montgomery County, Fairfax County, and Arlington County, as well as several practitioners.

Once introduced to the Stream Functions Pyramid Framework, attendees visited regenerative design site and two impaired stream sites. Participants then ascertained restoration potential and function lift for the two impaired sites and developed function-based project goals and objectives for both sites. Throughout the training, course participants provided input on how the SFPF could be applied to RSC projects. By the end of the training, a draft outline of this application was developed and concurrence on its use was given by both practitioners and regulators.

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