

Urban Tree Canopy Expert Panel Statement of Work ***Submitted by the Center for Watershed Protection, Inc. to Virginia Tech***

Expert Panel Chair:

Neely L. Law, PhD, Senior Research Analyst at the Center for Watershed Protection, will chair the Expert Panel on Urban Tree Canopy (UTC). Neely led the Chesapeake Bay Program (CBP) Expert Panel on Filter Strips/Stream Buffer Upgrades and participated on the Urban Nutrient Management, Enhanced Erosion and Sediment Control Expert Panels and is a current panel member for the Street Sweeping, Catch Basin and Storm Drain Cleaning Expert Panel. Her CV is provided as an attachment to this statement of work (SOW).

Expert Panel Membership:

The UTC Expert Panel will include three recognized topic experts, three individuals with expertise in environmental and water quality related issues, a representative from the CBP Watershed Technical Work Group (WTWG), and a representative from the CBP modeling team. The latter two will be assigned by the CBP. The individuals listed below have indicated their commitment to serve on the Panel with a letter of support and their CVs and support letters are provided as attachments to this SOW. All Panel members will be asked to disclose any potential conflicts of interest prior to serving on the Panel.

- Susan Day, PhD, Associate Professor and Director of the Urban Horticulture Center, Virginia Tech
- Peter MacDonagh, FASLA, Director of Design & Science, LEEP AP, CSLA, ISA, RHS, Kestrel Design Group
- Mike Galvin, ISA, Director of Consulting, SavATree
- Karen Cappiella, Director of Research, Center for Watershed Protection
- Sally Claggett, Program Coordinator, U.S. Forest Service
- Jessica Sanders, Director of Technical Services and Research, Casey Trees
- Thomas Whitlow, Associate Professor, Cornell University
- Qingfu Xiao, Assistant Research Water Scientist, University of California – Davis
- Keith Cline, Director, Urban Forest Management Division, County of Fairfax Virginia

In addition, David Nowak, Project Leader/Research Forester with the US Forest Service Northern Research Station will be given the opportunity to participate as a panel guest to provide input and discussion on the UFORE model.

Project Narrative/Scope of Work:

The specific tasks to accomplish the project objectives are described below.

Task 1. Assemble Panel

Using the scope and charge of the previous UTC Panel, the Center will make revisions as needed for review by the CBP. The Panel Coordinator (Jeremy Hanson, VTech) will send a draft with the proposed list of Panelists to the source sector Workgroups, the WQGIT Chair and Vice Chair, and the other GITs for their review and comment. The

Scientific and Technical Advisory Committee (STAC) will also be afforded the opportunity to comment before final approval. The Center will revise the Panel scope and charge and membership based on input from these various stakeholders. A brief description of the key Panel roles is provided below:

- Panel Coordinator: The Panel coordinator will assist the Panel Chair and the Panel to help them deliver a quality report in the specified timeframe by providing logistical support (scheduling calls/meetings, operating webinar and conference lines, provide meeting minutes and help set the agenda etc.) and strategic guidance on the expert panel process. He/she will also serve as liaison between the Expert Panel and the wider CBP partnership.
- Panel Chair: The Chair will be the chief strategist and panel lead. The Chair will work with the Coordinator and Panel members to assign specific tasks and ensure the Panel is on schedule. The Chair will use his/her expertise to facilitate productive technical discussions among the panelists. The Panel Chair and Panel members are responsible for developing the Expert Panel report that conforms in form and content with the *Protocol for the Development, Review, and Approval of Loading and Effectiveness Estimates for Nutrient and Sediment Controls in the Chesapeake Bay Watershed Model* (CBP BMP Protocol).
- Panel Members: The Expert Panel is responsible for following the specific charge of the Panel, as well as adhering to the BMP Protocol. Panelists will participate and offer their own unbiased expertise and best professional judgment throughout the process, and will perform assigned or voluntary tasks that assist the development of the final Panel report.
- Modeling Team Representative: The modeling team representative will serve as liaison between the CBPO modeling team and the Expert Panel, relaying and responding to questions that the Panel has for the modeling team regarding the simulation or incorporation of the BMP(s) into the CBP Watershed Model, Scenario Builder, or other modeling tools. He/she will also assist with the development of the Technical Appendix, which accompanies each Panel report.
- WTWG Representative: The WTWG representative serves as a Panel member to offer his/her expertise with BMP tracking and reporting, which is a crucial piece of the Panel's final report.

Panel support will be provided by Center for Watershed Protection staff, Ari Daniels, who will compile and summarize data from the UFORE model and other similar models and assist with the final report, and Karen Capiella who will provide support on the literature review and report development.

Deliverables: Final Panel charge and membership

Task 2. Literature Review and Synthesis

The Expert Panel Chair will coordinate a review and synthesis of the literature (published/academic and gray literature) on the water quality benefits of urban trees and the influence of various factors on their performance. The literature review conducted by the previous UTC panel will provide a baseline for this task.

The literature search will focus on the following major topic areas:

1. What is the effectiveness of urban tree canopy on reducing runoff, nutrient and sediment?
2. How does effectiveness vary by species, over time, with differences in planting sites (e.g., distance from impervious cover or other trees, soil conditions, geographic location) and with different maintenance strategies?

The Panel will search for relevant academic literature through university databases that provide access to numerous journals in the ecological, hydrologic and biological sciences. Internet searches will also be conducted to look for other relevant materials such as technical reports and state or local stormwater manuals that may provide documentation of sources for tree pollutant load reduction credits. The abstracts of all relevant articles will be obtained and read and, if the data presented is relevant to the research questions, the publication will be obtained and entered into a catalog. The Center for Watershed Protection will catalog publications with complete reference information using Endnote. The Panel Chair and Coordinator will determine the interface most suitable to share publications with the Expert Panel (i.e., Sharepoint or other web-based sharing software)

All of the literature entered into the catalog will be read to extract key information and to make an assessment of the study's relevance as well as the reliability of the resource. Key information that will be summarized includes: type of study, methods used, timeframe, geographic location, and relevant findings, including ancillary benefits of urban trees. Where studies with negative pollution reduction data are found, they will be considered the same as all other data. Data sources will be characterized according to the data source characterization matrix and other considerations described in the CBP BMP Protocol in order to determine how much influence (i.e. 'weight') the data should have on resulting estimates. A summary of the literature will be developed as part of the Expert Panel report that synthesizes the major findings of the literature review.

Deliverables: Catalog of relevant research studies

Task 3. Panel Meetings

The Panel Chair will convene up to six Panel meetings, including a stakeholder forum, to facilitate productive technical discussions among the panelists. Meetings #2 and #5 will be held at the CBP in Annapolis and the rest will be held by telephone conference. The Panel Chair will prepare materials for presentation at each Panel meeting and identify key questions to guide the discussion. At least one Panel meeting will be dedicated to review/discussion of the literature review results and one meeting will be centered around preliminary (strawman) recommendations for developing effectiveness estimates.

The second Panel meeting will be dedicated to an open forum where interested parties, other than the Expert Panel members, can share and present scientific data with the Panel members. The intent is to provide an open exchange of information that may help inform the Panel as it moves forward with its deliberations. The Center will lead the

Forum, which will be a half day meeting to be held at the CBP in Annapolis. At this meeting, the Panel Chair will present the charge of the Panel and will solicit feedback from attendees on specific issues to address with the Panel and relevant resources and research. The first part of the meeting will be open to stakeholders and the second part will constitute just the Panel members.

Deliverables: Minutes from the stakeholder forum and the Panel meetings

Task 4. Draft Expert Panel Report and Recommendations

The Expert Panel will develop a draft report that includes the following:

- Identity and expertise of Panel members
- Practice name/title
- Detailed definition of the practice
- Recommended nitrogen, phosphorus, and sediment loading or effectiveness estimates
- Justification for the selected effectiveness estimates, including a list of references used and a detailed discussion of how each reference was considered, or if another source was investigated, but not considered.
- Description of how best professional judgment was used, if applicable
- Land uses to which the BMP is applied
- Load sources the BMP will address and potential interactions with other practices
- Description of pre-BMP and post-BMP circumstances, including the baseline conditions for individual practices
- Conditions under which the BMP works/does not work/or varies in its effectiveness
- Temporal performance of the BMP including lag times between establishment and full functioning (if applicable)
- Unit of measure (e.g., feet, acres)
- Locations within the Chesapeake Bay watershed where this practice is applicable
- Useful life; effectiveness of practice over time
- Cumulative or annual practice
- Description of how the BMP will be tracked, reported, and verified:
- Suggestion for a review timeline
- Outstanding issues that need to be resolved in the future and a list of ongoing studies, if any
- Documentation of any dissenting opinion(s) if consensus cannot be reached
- Operation and Maintenance requirements and how neglect alters performance
- Any ancillary benefits or unintended consequences beyond impacts on nitrogen, phosphorus and sediment loads.
- A technical appendix that describes changes that will be made to the modeling and reporting tools to accommodate the BMP(s).

Deliverables: Draft Panel report with recommendations

Task 5. Approval Process

The Panel Chair will work with the Panel Coordinator to go through the CBP review and approval process. This will involve presenting the draft recommendations to the Forestry Workgroup, Urban Stormwater Workgroup, Watershed Technical Workgroup and the Water Quality Goal Implementation Team and addressing and responding to any comments received during the comment period. The budget and schedule assume one meeting with each workgroup plus two additional meetings with the Modeling Team if needed. Any additional meetings would be subject to additional expenses and an extension of the timeline. The Chair will seek the Panel's input in the event that significant comments are made, or major revisions are requested, as the report is reviewed by the CBP partnership. Although the Panel Chair and Coordinator are responsible for managing the comment process, Panel members may be expected to address and respond to comments received during the comment period, as appropriate.

Deliverables: Final approved report with recommendations

Project Timeline:

The project will be completed over a 10-month timeframe as shown in Table 1. The assumed period of performance for this work is February 9, 2015- December 9, 2015.

Table 1. Project Timeline	
Task	Completion Date (Months from Award)
Draft scope charge and membership	Month 1
Revised scope charge and membership	Month 1
1 st panel meeting	Month 1
Catalog of research studies	Month 2
2 nd Panel meeting and Stakeholder Forum	Month 2
Summary report of literature reviewed	Month 3
3 rd Panel meeting	Month 3
4 th Panel meeting	Month 4
5 th Panel meeting	Month 4
6 th Panel meeting	Month 5
Draft Panel report	Month 6
Review and approval by FWG	Month 8
Review and approval by WTWG	Month 9
Review and approval by WQ GIT	Month 10