

Proposed General Conceptual Model of Urban Impacts on Streams, 29 Oct 2007

General Notes:

- I did this in Powerpoint to facilitate easy modifications.
- My goal was to incorporate the content of the 1st urban stream symposium conceptual model while simplifying the spaghetti to make it more readable, and while adding a layer that shows potential management interventions and working within the conventions of the CADDIS models. I also tried to address Allison's thoughts expressed in her Oct. 1 email.
- I endeavored to follow the conventions used in the CADDIS models. However, this is such a simplification that I needed to make some modifications. Also, I added the category of management and created a new symbol for it.
- Arrows indicate major pathways. Additional pathways (which may also be important) are indicated by a plus sign and the appropriate letter or number. All of stressors 1-11 affect all of biota; this is what the big arrows and lines are meant to convey.
- I indicated decreased DO rather than increased DO variability, under the assumption that the actual stressor is an increase in occasional low DO, rather than the variability per se.
- Stressors not listed in a particular order; I just did what made the diagram simplest.
- The relationships/mechanisms between stressors and the biota are not explicit in this. The detailed submodels, which can be based on the CADDIS models, can show these.

Questions:

- Did I adequately incorporate everything from the 1st urban stream symposium conceptual model? If not, please add/correct.
- Does the section on the basis of the food web/general functional measures adequately capture the essentials? For example, increased leaf decomp rate is not explicitly noted; this is part of reduced OM retention / increased processing rate.
- Which of the stressors and linkages represented in the general model are regionally important/unimportant, and which are general?

Submodels:

The submodels need to show the mechanistic paths by which stressors affect the biota, especially to show which are potentially the most important and linkages where more research is needed.

One possible approach to breaking these down:

- 1) Hydrogeomorphic. Cully Hession leads a team that focuses on stressors 1-4, their interactions with other stressors and their mechanistic links to the biota.
- 2) Water quality. Someone (Jerry McMahon? Kate Schofield? Other volunteers?) leads a team to focus on stressors 5-9, their interactions with other stressors and their mechanistic links to the biota (emphasizing direct links to the higher levels (inverts and up)).
- 3) Trophic base. Mike Paul, Peter Groffman, Judy Meyer and/or others look at how the stressors affect the trophic base of the food webs and how these interact.

Again, I suggest we look first at the CADDIS models in developing the submodels.

These submodels could either be done sequentially or simultaneously. Doing them simultaneously would be more time efficient and might lead to competing ideas, which would generate good debate when we attempt to integrate them.

Suggested next steps:

- (1) Give feedback on this model and get it to a point where we're happy with it (or, if you think it stinks, say so and propose an alternative).
- (2) Make a list of the big research questions that are represented by this general model.
- (3) Consider major regional variations to this model. Maybe also consider how the model is different for suburban rather than urban watersheds, or for developing versus built-out watersheds.
- (4) Send the model to the larger group for review and comment; amend appropriately.
- (5) Discuss how to create the submodels.
- (6) Once we agree on an approach, split into teams for the submodels; each team must have a leader who takes responsibility. Teams should also consider potential regional differences and major research questions.
- (7) Teams report back to the executive committee, which comments on the submodels; somehow we integrate them into one monster model (?)