

Upscaling

Some major aspects:

Using a representative reach of a river (quantitative proof for this assumption?) for a modeling program and then transferring the results to other reaches of the river is not upscaling but simply working with random samples representing the entity.

Different models are applicable at certain scales only. A model must be able to represent its appropriate scale. The results of such models can be incorporated in larger scale management tools. This means that complex models can be used to directly generate generic information to be used within management + decision making tools to be given to basin managers or decision makers. This is important but not really upscaling.

Physical upscaling means to use results gained from a model with a certain (spatial) resolution on a certain scale, e.g. a river reach with a given length, and generate results that are applicable and valid to an area with a wider scale, e.g. a longer river reach or a higher organizational level (floodplain, other river reaches). Does anyone do that?

Multi-scale models include some principles from large scale models (e.g. temperature variability) into habitat models. Consider connectivity over space and time between small scale habitat units.

Is a direct upscaling needed or not

- Which are relevant parameters for an upscaling process (quantitative links across scales)
- Modeling approaches used for upscaling
- Is downscaling ever required?

Physical habitat modeling (small scale) aspect	Large scale aspect
<ul style="list-style-type: none"> • Static flow, time series • Precise, but inadequate scale • Single species/life stages approach • Static physical habitat • Non-disturbance condition 	<ul style="list-style-type: none"> • Many species, ecosystem approach • Holistic approach • Larger spatial scale • Theory based, dynamic • Disturbance • Large scale processes form physical habitat -> physical hierarchie • Dynamics = variation over time, natural flow regime • Baseflow stability and flood frequency • Importance of flow for shaping riverine ecological processes

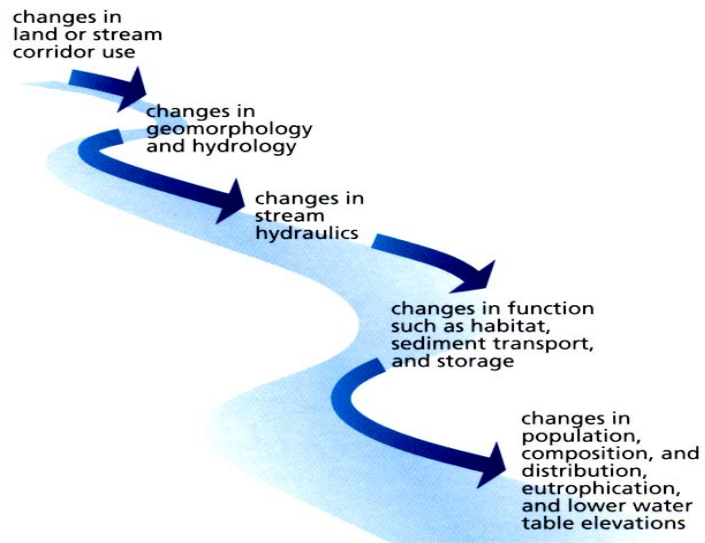


Fig. 0-1: Relevant aspects for floodplain ecological processes (Wentworth 2001)