

# Reconnect Vermont Rivers

## Vermont ANR Rivers Program

Vermont rivers are being physically restored at a remarkable pace. Restoring the physical nature of a river is about making the connections that allow natural restorative and maintenance processes of the river to take over. Vermonters are securing hundreds of river connections every year. Every time we install a larger culvert to fit the stream, remove a dam, or give space for a river to meander, we are restoring vital connections that, in time, will make us safer during floods and sustain the multitude of fish and wildlife species that depend on healthy rivers.

### What are connected rivers?

They are:

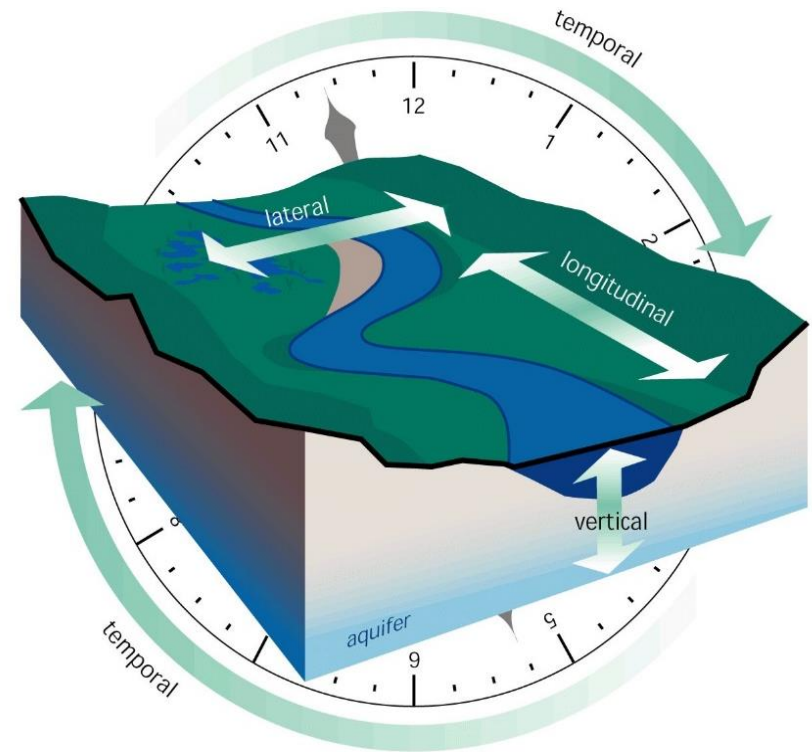
- Free-flowing water with minimal human diversion, obstruction, or stormwater surcharge;
- Surface waters that exchange with groundwater and flow into wetlands and floodplains during floods; and
- Dynamic meandering systems within naturally-vegetated riparian corridors that are wide enough to accommodate a river's minimally erosive pattern and dimensions.

Our villages and roads sprang up along rivers, and the sustainability of many Vermont communities will require that certain river segments remain disconnected with structural controls. However, thousands of river disconnections have become derelicts of the past and represent opportunities to restore river processes to their natural, connected state in a way that benefits Vermont's social, economic, and environmental well-being over time.

From 2015 to 2017, more than 1,200 river projects were completed to reconnect rivers or maintain river connections in Vermont, and this counts only those known to the agencies of Natural Resources and Transportation.

The movement to reconnect our rivers is underway and we have an opportunity to celebrate what is becoming a collective effort to improve our commitment to flood resiliency and healthy watersheds. We, as watershed leaders dedicated to restoring the physical integrity of river and riparian ecosystems, have a tremendous opportunity to achieve even greater momentum by affiliating into a broad campaign to **Reconnect Vermont Rivers**.

The Four Types of River Connectivity



In Stream Corridor Restoration: Principles, Processes, and Practices, 10/98.  
Interagency Stream Restoration Working Group (FISRWG)(15 Federal agencies of the US).

Historically, the importance of river connections was not well understood. People worked with increasing industrial capacity to channel streams and rivers in an effort to dry their lands, power their mills, and protect themselves from floods. We now understand that many attempts to contain flood waters have been a recipe for erosion and a threat to public safety, with an annual cost of tens of millions of dollars in damage. These losses, often incurred downstream, must be accounted for in river management and decisions to build or maintain structures in river corridors.

When structures or instream activities result in a disconnection, an imbalance is created which increases either the erosion or deposition processes that would otherwise naturally distribute evenly along the river continuum over time. Increases in stream power lead to erosion of the stream bed and banks, undermining bridges or the foundations of other structures. Large decreases in stream power lead to excessive deposition of sediment and large wood that clog the river channel, sending flood waters over roads and into village streets.

State, federal, and regional agencies, non-profits, and private foundations are providing technical, regulatory, and/or funding assistance to remove derelict dams and replace undersized stream crossings that disconnect upstream and downstream segments of river.

Other connections are being achieved by restoring buffers and floodplains, purchasing river corridor easements, and limiting or avoiding the:

- Construction of berms, levees, ditches, fills, or straight, over-deepened channels that disconnect rivers, wetlands and floodplains;
- Indiscriminate river dredging that creates shallow, over-widened, and aggrading (deposition-prone) river channels;
- New encroachments within river corridors that constrain meanders and result in more powerful, over-steepened channels;
- Diversions and dams that decrease river flow; surcharges of stormwater from ditching and impervious cover; and
- Removal of the woody debris and native riparian vegetation that provides food, shade, and shelter to fish and aquatic organisms.



Rivers are constantly working toward balance and connectivity—with or without human intervention. Therefore, our avoidance strategies form a strong foundation for river restoration. As rivers keep working, we “passively” restore them by limiting, avoiding, or removing encroachments.

Vermonters have an important opportunity to organize their ongoing active and passive restoration work under the readily understood concept of **connectivity**. The ANR Rivers Program will seek to work with other agencies and organizations to unite our education and outreach efforts under such a banner. Our cumulative success to *Reconnect Vermont Rivers* will represent tangible year-to-year progress to a citizenry eager to see improvement in flood resilience and the restoration and protection of our waters. Policymakers and those with the means to support this work will hopefully come to see these results as making a significant and immediate contribution to the health of our economy and environment. Finally, going forward, Vermont communities will increasingly face the challenges and financial stress that will accompany the droughts and floods of a changing climate. The connected river may just be the low cost, working landscape that pulls us through.