



# EPA Region 7

## Urban Stream Monitoring Network

MONITORING THE HEALTH OF KANSAS CITY METRO STREAMS

### NETWORK STREAMS

Shoal Creek

Line Creek

Jersey Creek

Brenner Heights Creek

Turkey Creek

Brush Creek

Indian Creek

Tomahawk Creek

Coffee Creek

Blue River

Cedar Creek

Mill Creek

### CONTACTS

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## The Importance of Urban Streams

Urban streams are dynamic ecosystems with physical, chemical and biological traits that are inextricably linked with the characteristics of the lands that they drain – their watersheds.

These living systems provide many benefits to urban watershed residents. When their riparian zones - the vegetated strips of land along their banks - are intact, stream corridors contain habitat for a diversity of native plants, animals and insects. Furthermore, riparian zones filter and purify stormwater, at the same time as they mitigate flooding by acting as large, permeable infiltration surfaces. And because all urban streams flow into our large area rivers - the Blue, Missouri, and Kansas - the quality of

their ecology directly impacts that of the receiving rivers, which are not only functioning ecosystems, but sources of drinking water for many.



Brush Creek through Prairie Village

Urban streams also enhance community health and socio-cultural well-being by providing a place to experience nature in our own backyards. This access offers a diversity of people, a variety of contemplative, inspirational, recreational, fishing, educational, and cultural experiences.

Unfortunately, the process of urbanization has degraded the quality of urban streams. Most urban streams are largely channelized, with their banks engineered for stability. Also, the lands in their watersheds are mostly developed, with a high degree of impervious surfaces. These conditions leave urban streams subject to increased stream velocities, scouring, and the destruction and elimination of in-stream and near-stream habitats. Local streams also receive contributions from households and industry, and when their riparian zones are degraded making them unable to function as filters, they are subject to pollutants from runoff, such as pet waste, transportation bi-products, and landscaping chemicals.

## Kansas City Urban Stream Monitoring Network

The EPA Region 7 Kansas City Urban Stream Monitoring Network was born of the need to address the degradation of urban streams, which have not been monitored comprehensively nationwide. Building on previous monitoring conducted by EPA, USGS and others, since 2006 we have used scientifically-based monitoring and assessment protocols to determine the condition of 12 Kansas City area streams, and how their states change over time,

in response to various urban factors.

We envision a network of monitoring sites and data generation that serves as a prototype for other urban areas, and enhances public awareness around local stream quality, allowing for real-time water quality reporting to the public, similar to that for air quality indicators like ozone and allergens.

Our efforts are intended to

increase scientific understanding of urban stream systems and their quality indicators, determine baseline stream conditions, reveal water quality trends, identify sources of impairment, and inform the public about stream conditions. Ultimately, we want to facilitate the protection and restoration of the biological, chemical, and physical integrity of our urban streams, and increase awareness and action around their plight.

# Stream Quality Indicators

Slender Madtom



Stonefly Larva

We monitor stream quality by looking at the following factors: flow regime; physio-chemical parameters; algae; macro-invertebrate and fish communities; instream and nearstream habitat; watershed condition; and water column and sediment chemistry.

Each stream in the study has three monitoring segments - lower, middle, and upper reach - and most monitoring

sites include the three main stream macrohabitats—pools, riffles and runs. Information on possible sources of contaminants, and places where stream segments are subject to significant runoff, are also noted.

The determined conditions can be statistically analyzed in comparison to data from that of least-disturbed (reference) streams, as a way of ranking stream quality

against a known standard. The data may be used to track the progress of protection and restoration efforts in the urban environment, and will provide citizens with important information regarding recreational opportunities and aquatic ecology. We hope to release a report detailing the results of efforts over the last several years and propose a water quality index for use in the Kansas City metro area.

## Partnership

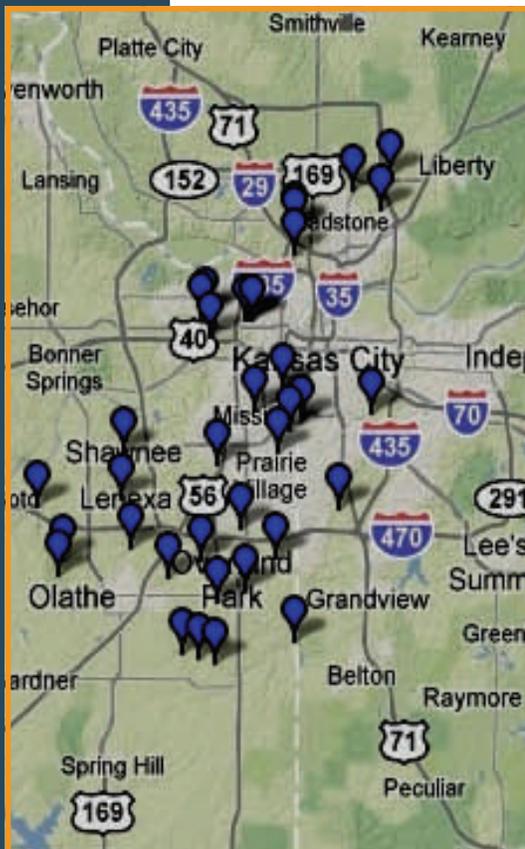
EPA Region 7 is engaging local community partners with stream monitoring skills in this Kansas City monitoring effort. Potential partners can adopt monitoring

for all or some of the parameters in a particular stream. We believe that local entities who conduct monitoring will benefit from the experience by increasing their scientific understanding of urban streams and monitoring methods. We also hope that their participation in this study will translate into acts of collaborative community engagement on

municipal and watershed levels that educate about and advocate for urban streams.



Partnering with Park University on Line Creek



Kansas City Urban Stream Monitoring Sites

## [www.kcwaters.org](http://www.kcwaters.org)

[www.kcwaters.org](http://www.kcwaters.org) is a Kansas City stream data sharing site, hosted by the University of Missouri - Kansas City (UMKC) Geosciences Department. By bringing together all the data generated by monitoring in the Kansas City metro area, through federal, state, and local partners, we hope to create an accessibility and transparency that all the project partners can rely on to understand stream quality both in water-

sheds, and particular stream segments. This sharing can also further the development of shared monitoring protocols and inform the best use of various stream protection and restoration strategies, such as Best Management Practice placement and green infrastructure development. Most importantly, it can provide local citizens with a single point to access information about waters in their own backyards.