Potential Team Projects for Rocky Branch Watershed

Geography 549, Spring 2012

The following are potential project themes for Rocky Branch Watershed (RBW). These and other concepts will be discussed in lecture and some will be developed in exercises. All topics can be adapted and modified as appropriate. Try to balance work load with quality and value of new information produced. Teams should consist of three or four individuals with no more than two graduate students on a team. More than one team can approach the same theme if efforts are coordinated so that unique contributions are made and redundancy is minimized. Teams are encouraged to work together by sharing data and expertise. This is not a competition, but an effort to learn techniques for understanding the hydrology of a complex urbanized watershed.

) STREAMFLOW

Daily Streamflow Data

- Collect available RBW flow data from USGS gages; compare with data on course web page and upload missing data as needed.
- Embellish with field measurements
- Compute flow duration curve(s) at longest term gauge(s)
- Analyze 7-day low-flow probabilities
- Compare gauges with overlapping time periods to drainage area

Flood Hydrology

- Collect annual maximum and partial duration series flood data from USGS gages in RBW; compare with data on course web page and upload missing data as needed.
- Generate storm hydrographs for larger events
- Compute unit hydrographs for various storm events
- Use simple lumped models (e.g. rational method) to estimate peak Q based on land use drainage area, etc.

) WATER QUALITY

- Collect available water quality data for RBW (there isn't much)
- Embellish data with sonde (requires calibration of Geography sonde or availability of another)
- Compare/analyze relationships between WQ and
  .) streamflow (get data from Streamflow team(s)
  .) drainage area
  .) percent impervious
- Collect stormflow WQ data: revive ISCO sampler; arrange for or do lab analysis

) SPATIAL WATERSHED MAPPING

Generate New Maps. Get LiDAR data for RBW from course web site:

-) Shaded relief, contours, drainage divides, channel networks,

-) Examine plane and slope curvature and compare with manual contour crenulations

Compare/Analyze Impermeable Surface Map:

-) Which subwatersheds have densest urbanization?

-) Where would detention storage of flood runoff be most effective?

-) What type land uses have most impermeable surfaces (use zoning map)

-) How have impermeable surfaces changed over time (compare Wooten & CEE maps)?

Map storm sewers, culverts, detention structures, road-side ditches, etc.

-) Use LiDAR base maps (from course web site) and hand-held GPS to field map features in a selected subbasin of RBW. Don't assume existing maps are correct; they have not been field tested; that is what this project would involve. Where channels go underground is generally not known yet drives hydrologic response. Systematic field mapping of channels is needed to identify the true channel network and efficiency of conveyance.

Map areas vulnerable to flooding/ construct flood histories

-) Where do residential, commercial and industrial developments occur in low-lying areas? Compare LiDAR maps with zoning and impermeable surface maps.

-) What has been their history of flooding? Community surveys may be used here.

Compile and register historical map data

-) Collect historical maps (T. Cooper library, etc.)

-) coregister them using ArcGIS

) WEB PAGE DEVELOPMENT

All teams will be expected to develop web-ready materials for incorporation on a RBW web site. The end online product should be part of the final presentation along with findings given in a power point presentation.