

## MAPPING FLOOD STAGES FOR BASIN COMMUNITIES

*"The commission may study and determine the nature and extent of the flood plains of the Susquehanna River and its tributaries. Upon the basis of the studies, it may delineate areas subject to flooding, including but not limited to a classification of lands with reference to relative risk of flooding and the establishment of standards for flood plain use which will promote economic development and safeguard the public health, welfare, safety, and property."*

--Article 6, Section 6.2 of the Susquehanna River Basin Compact, P.L. 91-575; 84 Stat. 1509 et seq.

### What is a flood stage forecast map?

In the mid-1970s, the Susquehanna River Basin Commission (SRBC) developed a technique to produce flood stage forecast maps that reflect a range of stream stages that are tied to forecast points. SRBC prepared and widely distributed maps for 90 basin communities. Each community map covered all or portions of that community.

The maps provide details of flood plain areas and flood profiles with water level contours to show and explain what areas in a community will be inundated as flood waters reach certain levels (flood stages). These maps were developed using the flood profiles generated for the federal flood insurance program and relate to stream gages operated and maintained by the U.S. Geological Survey. Data from these stream gages are used by the National Weather Service as forecast points. Each map identifies the location of the stream gage used in preparing the map.

SRBC currently is seeking funds to produce maps for other communities.

### Why are flood stage forecast maps important for the basin?

The Susquehanna River Basin is one of the nation's most flood prone areas--experiencing over six times the national average in damages per square mile each year. Of the 1,388 basin communities, 1,150

of those are affected by flooding. Furthermore, since the year 1810, the basin has been devastated by a major flood about every 20 years, with the most recent being the January 1996 flash flood.

Because the basin is so flood prone, it is important that community officials and residents understand what will happen to them when the basin's waterways reach flood stage. Many basin residents are unfamiliar with and confused by the term "flood stage." For example, when a flood stage of 20 feet is predicted, people want to know if that means the water will rise 20 feet from the river's bottom or 20 feet above normal levels. Does it mean a wall of water 20 feet high will come down the river or that the water will rise 20 feet over the flood plain?

The flood stage forecast maps convert forecasted flood stages, issued by the National Weather Service, to mean local water level elevations for communities within the map study area.

### Who uses flood stage forecast maps?

The maps can be used by: 1) emergency personnel to identify areas that will be inundated first; 2) municipal officials to develop flood evacuation plans; and 3) individuals living near the flood plain to easily determine how the forecasted flood will affect them.

### How long can the maps be used?

Once produced, the flood stage information is considered permanent. The only factor that may change is the addition of new development within the mapped area.

SRBC widely distributed the maps during the early 1980s to the community officials that were in office then. However, since there is a significant amount of turnover in local government, it is important that newly-elected officials be made aware of these maps so the communities can continue to benefit from them.

### **How are the flood stage forecast maps used?**

Flood stage delineations, indicated by contour lines on the map, are placed usually in five (5) foot intervals. The intervals are chosen based on the topography of the flood plain. SRBC determined that a stage interval of five feet at the forecast point is generally adequate for interpretation and accuracy.

A flood stage forecast map is used after the National Weather Service or another reliable source predicts the expected flood stage for a specific event. Once that information is available, the map user can refer to the map and follow the instructions included on each map. In the next column is a sample instruction with the associated graphic.

The delineation lines placed on the map simply define the area of inundation to be expected if the forecasted flood stage happens to be one of the pre-selected stage interval lines. If the forecasted stage is not one that has been placed on the map, the map user must interpolate between stage interval lines. A more conservative approach, especially where delineations are provided at less than five foot intervals, is to use the next highest stage inundation line shown when considering the next course of action.

### HOW TO USE MAP

1. Locate your property on map.
2. Determine the flood stage which will affect you. Consider not only water on your property, but also water preventing your evacuation.
3. Listen for forecasts on the radio and television of stages at the stream gage used on the map.
4. If the forecasted stage could affect you, begin emergency actions. If not, listen for revised forecasts until waters recede.

EXAMPLE: If you live in House A, river stages greater than 24 feet [indicated as 24 on the map] would affect your property directly. If your evacuation route goes through a low-lying area, emergency action may be required at a lower stage than the stage affecting your property.