A real-time experimental system to estimate and forecast floods over the globe, the Global Flood Monitoring System (GFMS), has been significantly improved to provide flood detection, streamflow and inundation mapping information at higher resolution (as fine as 1 km) and nowcasts and forecasts (out to five days). Images and output data are available for use by the community with updates available every three hours (http://flood.umd.edu). The system uses satellite-based rainfall information, currently the TRMM Multi-satellite Precipitation Analysis [TMPA]), other satellite and conventional information and a newly-developed hydrological and routing combination model. The improved combined model, the Dominant river Routing Integrated with VIC Environment (DRIVE) system, is based on the VIC (Variable Infiltration Capacity) land surface model (U. of Washington) and the Dominant River Tracing Routing (DRTR) method. Within the DRIVE system the surface hydrological calculations are carried out at 0.125° latitude-longitude resolution with routing, streamflow and other calculations done at that resolution and at 1km resolution.

Flood detection and intensity estimates are based on water depth and streamflow thresholds calculated from a 15-year retrospective run using the satellite rainfall and model. Efforts are underway to link the satellite rainfall estimates to global NWP rainfall predictions (adjusted to the satellite data) to extend the flood calculations out to five days. Examples of results for recent flood events are presented along with validation against a global flood inventory and streamflow observations.