

National Weather Service Updates Flood Stages for Some Rivers in Puerto Rico

The National Weather Service (NWS) is implementing updates to flood stages for several U.S. Geological Survey river gages across Puerto Rico. This initiative is a critical step in enhancing the river flood warning program, providing better tools for the public and emergency management partners to anticipate and respond to flood events.

Methodology for New Stages

The revised flood stages were determined through a multi-faceted approach centered on statistical analysis and data from impacts collected from previous events.

The methodology is a statistical analysis linking the Exceedance Annual Probability (the chance of exceeding the threshold of a certain event; EAP) to the river flow required to reach Minor, Moderate, and Major flood stages. The EAP benchmarks utilized for classifying these stages are:

Flood Stage Category	Exceedance Annual Probability (EAP)
Minor	0.5 to 0.2
Moderate	0.1 to 0.04
Major	Above 0.02

This statistical framework was combined with impacts collected from previous Local Storm Reports (LSRs), historical watermarks collected by the Junta de Planificación de Puerto Rico, Flood Inundation Maps (FIM) to distinguish the impacts associated with each river flood category, and historic floodings associated to these river gages.

Flood Stage Definitions

The NWS utilizes specific impact criteria to define the conditions associated with each flood stage category:

- **Action Stage:** Action is taken for possible high water. Water may cause minor impacts and be a nuisance to persons near the stream. Local governments or agencies may take actions to reduce property damage and danger to life.
- **Minor Flood Stage:** Some property flooding and public threat may occur. Roadways, trails, park land, and private property near the stream may become flooded.
- **Moderate Flood Stage:** Flooding of structures and main roadways may occur. Residences and numerous roadways near the stream may become flooded. Evacuations may be necessary. Disruptions to daily life.
- **Major Flood Stage:** Extensive flooding of structures, main roadways, and other critical infrastructure may occur. Schools, hospitals, police stations, fire stations, residences, businesses, and roadways may become flooded. Evacuations may be necessary. Significant disruptions to daily life.

Next Steps

The National Weather Service is committed to continually evolving its Hydrology program. The validation of these new flood stages will require **additional field work and supplemental flood reports** to confirm their accuracy and effectiveness. Furthermore, efforts are ongoing to review or define flood stages for other river gages across Puerto Rico.

River Gage Name	NWSLID	Former Flood Stages				New Flood Stages			
		<i>Act</i>	<i>Minor</i>	<i>Mod</i>	<i>Major</i>	<i>Act</i>	<i>Minor</i>	<i>Mod</i>	<i>Major</i>
Rio Tanama at Charco Hondo	ARDP4	8	11	15	19	8	11	15	22
Rio Bairoa abv Bairoa	CABP4					8	10	13	15
Rio Turabo abv Borinquen	CAKP4	9	12			9	12	16	18
Rio Camuy nr Bayaney	CMAP4	12	16	18	20	15	17	20	25
Rio Canovanas nr Campo Rico	CNAP4	7	10	13	15	10	13	15	17
Rio Gurabo blw Mango	GUTP4	13	18	20	22	13	16	19	22
Rio Caonillas at Paso Palma	JAXP4	12	16	20	24	12	16	N/A	N/A
Rio Saliente at Coabey nr Jayuya	JAYP4	8	11			8	10	13	16
Rio Guadiana nr Guadiana	NAMP4	5	8.25			5	8.25	14	17
Quebrada Josefina nr Pineiro Ave	QJOP4					8	11		
Quebrada Margarita	QMAP4	5	7.25			5	7.25	13	14
Rio Grande de Loiza at Quebrada Arenas	SLLP4	8	11	16	21	9	12	16	21
Rio Usabon at HWY 162 nr Barranquitas	USAP4	8				8	10	14	22
Rio Espiritu Santo nr Rio Grande	VEDP4	6	9	12	14	9	13	15	17

- Newly defined flood stages are in blue.