



### U.S. Army Corps of Engineers Institute for Water Resources

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#### HEC Provides “GIS for Hydrologic and Hydraulic Modeling” Training in Brazil

ALEXANDRIA, VIRGINIA. The US Army Corps of Engineers (USACE) and Brazilian Agência Nacional de Águas (ANA) entered into an agreement in 2013 for a mutual exchange of expertise. ANA’s mission includes water resources management, monitoring of rivers and reservoirs, planning of water resources, and disseminating hydrologic information to encourage the proper management and sustainable use of water resources in Brazil. A significant contribution to the agreement between USACE and ANA has been technical training classes provided by USACE subject matter experts (SME) to ANA on topics of flood risk management, reservoir operation, and the planning and operation of hydrologic networks.

The Institute for Water Resources’ (IWR) Hydrologic Engineering Center (HEC) is participating in a number of the technical training classes in support of the USACE and ANA agreement. Since the agreement was signed, HEC SME’s have taught classes in hydrologic modeling with HEC-HMS, hydraulic modeling with HEC-RAS, and application of GIS data and tools for hydrologic and hydraulic modeling. Upcoming classes will focus on more advanced hydrologic and hydraulic topics, including continuous simulation, unsteady flow, and sediment transport, and include reservoir simulation with HEC-ResSim. The technical training classes are taught in Brasilia, Brazil at one of the ANA offices and are typically five days long, Monday through Friday, eight hours per day. Not only are students from ANA, but other federal agencies are invited as well as academia, which include both professors and graduate students. Class size ranges between 25 and 35 students and instruction is in English. The class structure includes lectures followed by workshops to allow the students to apply lecture topics to real world examples using software developed at HEC.

A common report from HEC instructors is that the Brazilian students are extremely engaging during the classes. At the beginning of the class, instructors are warmly welcomed by the class coordinators and introduced to the students. Students have been eager to learn and discuss the material during the lectures and especially during the hands-on workshops where questions about applying the class material to their own projects are discussed. Breaks and lunch have been a great opportunity to talk more in depth with individual students to gain a personal perspective on their work and to build relationships.

During the most recent class, Application of GIS for Hydrologic and Hydraulic Modeling, the students were asked to bring in data (terrain, precipitation, and flow) specific to the watersheds they work within. On the last day of the class, the students applied the tools taught during the class, HEC-GeoHMS and HEC-GeoRAS, and developed models specific to their watersheds. By the end of the day, students had preliminary models up and running which could be further refined when returning to their offices.

#### Learn More

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