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DEVELOPMENT OF A PROTOTYPE SYSTEM OF TORRENT MANAGEMENT FOR THE SUPPRESSION OF FOREST FIRES.

Dimitrios Emmanouloudis¹ and George N. Zaimes²

More than a thousand torrents flow through the Greek peninsula, while very few to none are used for beneficial uses. Beneficial uses of torrent waters could include irrigation of agricultural fields, water supply for municipalities and production of hydro-electric energy.

The storage of torrents waters in reservoirs could also be used to suppress forest fires, a major problem in Greece. Most forests of Greece are in mountainous watersheds, with torrents the closest surface water quantities. This fact makes torrential water the most logical and feasible source of water that could be used to suppress forest fires.

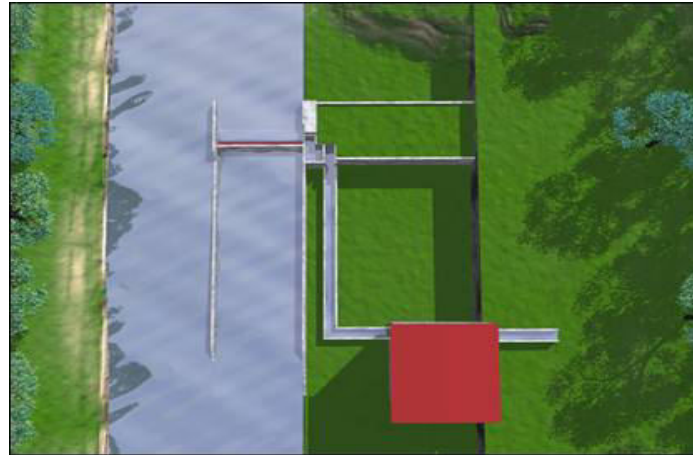
In Greece the process of filling airplanes or helicopters with water to fight fires is relatively easy because of the unlimited quantities of water in the seas that surround the Greek peninsula. However this is not true for the land vehicles that fight fires. The land vehicles are the main means of fire fighting during night times because is prohibited for planes and helicopters to fly. Additional problems for land vehicles are frequent damage of water supply networks or water filling pumps during fire events because of the high temperatures. Thus, many times the activities of these land vehicles can be ineffective, while they are imperative in the suppression of the fire during night times when forest fires can restart.

Initially, this will be developed for Thasos Island in northern Greece that has had many severe fires in the last 20 years. However, its future application will be for the entire Greek peninsula and its islands.

This paper will investigate its capability of supplying the forest land vehicles with the necessary amount of water from the torrential watershed of Prinos, Thassos. This will be done by using a hydrologic model adjusted with a GIS. After the relevant research, the appropriate number and location of dams that need to be constructed we will be suggested. The type of dam that used will be a prototype that is the most suitable for this Mediterranean environment. These are small overlapped dams that are able to collect water even under extremely small baseflow conditions. This type of flow conditions is typical of Euro-Mediterranean torrents. The collected water will be moved to the subsurface reservoirs through intake canals (Figure 1). When the reservoirs are filled up a pumping system will supply water to the fire land vehicles.

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Figure 1. The overlapped dams: a) aerial view, b) cross-sections of the pumping system and the intake canals.