

A Computer Model for Evaluating Jessour

Design and Location in Arid Regions

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Senior Capstone Design

Project: To design a process for evaluating Jessour locations and design using GIS information and a WEPP water/erosion modeling program

Objective:
To develop a computer model to simulate the construction of a jessour in arid regions

Jessour Design Process:

- Research of geography and sociology of region, and history of Jessour usage
- Analyze GIS Data and select multiple alternatives
- Use Water-Modeling Programs
- Design the Jessour
- Analyze Social and Economic Impacts
- Determine and Present results

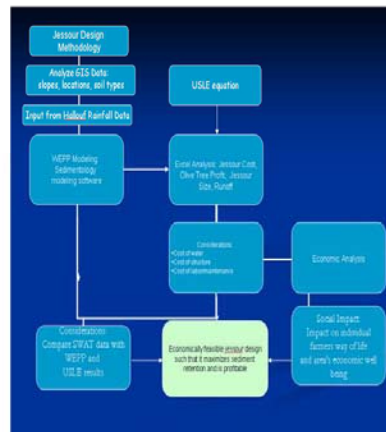


Tunisia is located on the Mediterranean Coast in Northern Africa

Climate→ The climate varies from a Mediterranean climate in the northern part of the country to a desert climate in the south

Rainfall→ In the southern part of the country, Tunisia's rainfall can vary from 0-150mm per year

Schematic of Design Methodology



Jessours in the Matmata mountains. A hydraulic unit made of three components: the catchment area, the terrace and the dyke. The jessours are used to bank the runoff from the mountain chain.



Importance of Olive Trees:

Olive Trees are the main crop for the region. Their fruit is a source of food, and also through the production of olive oil a source of income.

Over 95% of the Halouf watershed's (based on GIS Data) agricultural landuse was for Olive trees.

Olive trees require a minimum of 50 cm to start growing. The main soil type here was only 10mm deep, with hard rock underneath. The purpose of a Jessour is to trap sediment in order to grow crops.

