



WATER RESOURCES MANAGEMENT

LECTURE 1 – INTRODUCTION

INTRODUCTION

- Syllabus Review
- Website Tour
- Definitions/Concepts

DEFINITIONS/CONCEPTS

- Water Resources Management

- The activity of planning, developing, distributing and managing the optimum use of water resources. Water resource management planning considers the competing demands for/ on water (quantity, quality, location, and timing) and seeks to allocate water on an equitable basis to satisfy all uses and demands.

DEFINITIONS/CONCEPTS

- **Allocate**
 - 1: to apportion for a specific purpose or to particular persons or things : distribute
allocate tasks among human and automated components
 - 2: to set apart or earmark : designate allocate a section of the building for special research purposes
- Because the resource is scarce; allocation will by necessity deny the resource to some, and supply it to others.

DEFINITIONS/CONCEPTS

- **Equitable**
 - 1 : having or exhibiting equity : dealing fairly and equally with all concerned an equitable settlement of the dispute
 - 2: existing or valid in equity as distinguished from law an equitable defense
- Because the resource is scarce; allocation will by necessity deny the resource to some, and supply it to others. Equity implies some kind of “fairness” is that allocation.

DEFINITIONS/CONCEPTS

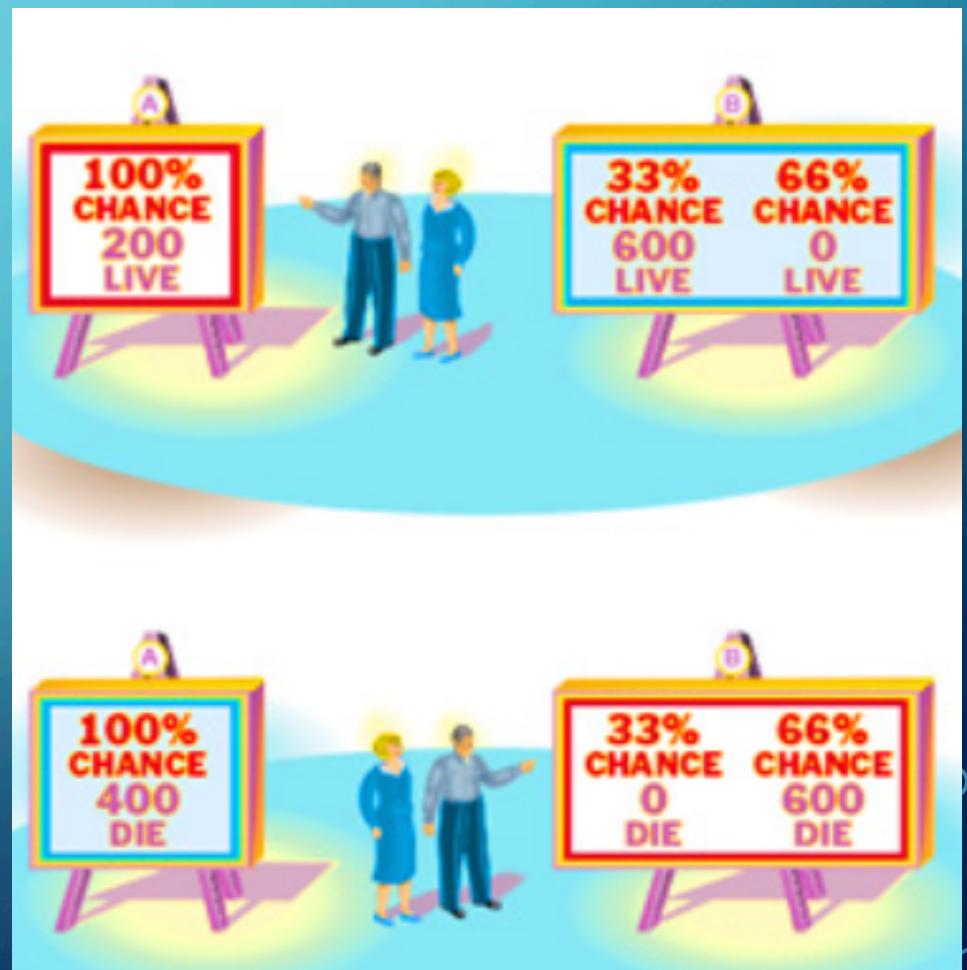
- The allocation requires decisions be made
 - Individual decision maker
 - Collective decision maker(s)

DEFINITIONS/CONCEPTS

- How do individuals and groups make decisions?
 - Some people may seem indecisive or inconsistent. They may avoid making decisions as long as possible. The same reluctance to make decisions also happens in organizations or institutions.
 - On the other hand, some people and groups may be accused of "leaping to conclusions" or making a decision "without considering all the facts."
 - This implies that decisions should be made by collecting and weighing various elements in a rational way. (That is alternatives must exist, or there is no decision)

DEFINITIONS/CONCEPTS

- How do individuals and groups make decisions?
 - Psychological Aspects
 - People's choices depend upon how alternatives are presented



DEFINITIONS/CONCEPTS

- Examine what we have so far
 - Scarce resource
 - Allocate fairly
 - To allocate we need to make decisions
 - Decisions (by people) are emotional at the moment of the decision

DEFINITIONS/CONCEPTS

- Challenge of Water Resources Management
 - Define "what is fair" for a situation
 - Define alternatives (present a decision point)
 - Implement tools to support the decision

DEFINITIONS/CONCEPTS

- Tools to Support the Decision
 - Value to alternatives – how to measure “fairness”
 - Policy to rank the value(s)
 - Policy to guide the decision
 - We could hand off the decision to an algorithm
(Narrow Domain AI)

DEFINITIONS/CONCEPTS

- Tools to Implement the Decision
 - Do we control the system?
 - SCADA Algorithm operating a water distribution network – can probably fully autonomous with little human intervention
 - ... or just influence the system
 - Voluntary compliance versus risk of apprehension for water quality management