Environmental Laws vs Laws of Nature

Using Enterprise Architecture to Model the Balance of these Systems

Science of Laws

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Some Facts About Laws

- More than 5,000 bills are introduced in Congress each year.
- Only about 150 of them become law.
- Local ordinances are typically the easiest to pass, while federal and international laws are the most complex and challenging.
- The majority of laws occur at the local or state level - close to home.
- A bill is more likely to become a law

when it is simple and proposes only a minor change or addition to an existing law.

Some Interesting laws

- It's against the law to catch fish with your bare hands in Kansas.
- In Utah, it is illegal to swear in front of a dead person.
- Driving more than 2,000 sheep at a time down Hollywood Blvd. is prohibited by law.
- You can't plow a cotton field with an elephant in North Carolina.
- In Georgia, US, members of the State Assembly cannot be ticketed for speeding while the State Assembly is in session.
- Hypnotism is banned by public schools in San Diego.
- In Cleveland, Ohio it is illegal to catch mice without a hunting license.
- In Kentucky, it is illegal to carry ice-cream in your back pocket.
- In Nebraska, It is illegal for bar owners to sell beer unless they are simultaneously brewing a kettle of soup.
- It is illegal to hunt camels in the state of Arizona.
- In Pennsylvania, it is illegal for a man to purchase alcohol without written consent from his wife.
- In Miami, it is forbidden to imitate an animal.
- Alaska law says that you can't look at a moose from an airplane.

Major Environmental Laws

- **Atomic Energy Act (1954):** government's keen interest in monitoring the commercial and national defense uses of atomic energy.
- **Clean Air Act (1970):** Sets goals and standards for the quality and purity of air in the United States. By law, it is periodically reviewed. A significant set of amendments in 1990 toughened air quality standards and placed new emphasis on market forces to control air pollution.
- **Clean Water Act (1972):** Establishes and maintains goals and standards for U.S. water quality and purity. It has been amended several times, most prominently in 1987 to increase controls on toxic pollutants, and in 1990, to more effectively address the hazard of oil spills.
- **Coastal Zone Management Act (1972):** Provides a partnership structure allowing states and the federal government to work together for the protection of U.S. coastal zones from environmentally harmful overdevelopment.
- **Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)(1980):** Requires the cleanup of sites contaminated with toxic waste. This law is commonly referred to as "Superfund."
- **Endangered Species Act (1973):** Is designed to protect and recover endangered and threatened species of fish, wildlife and plants in the United States and beyond. The law works in part by protecting species habitats.

Measures of Effectiveness

- Based on the Ideal Law of Government, a law:

  (1) Is simply stated and has a clear meaning;

  (2) Is completely successful in achieving its problem-solving objective;

  (3) It interacts synergistically with other laws;

  (4) It produces no detrimental side effects; and

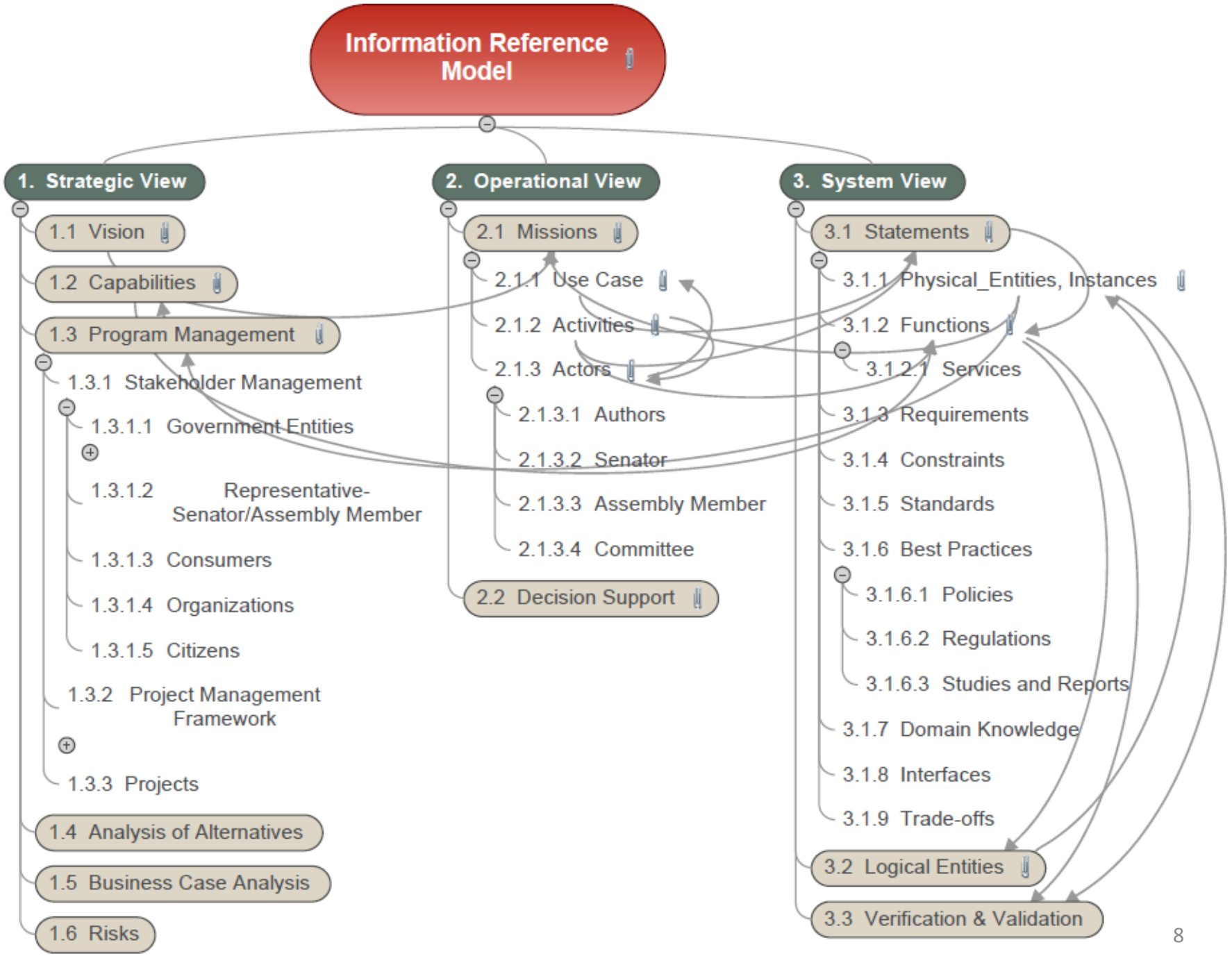
  (5) It optimally serves the purpose of democracy

"Law is a bottomless pit; it is a cormorant,--a harpy that devours everything."
Jonathan Swift


Concept Exploration
Research and Development
Verification and Acceptance
System Validation & Deployment
Operations and Maintenance
Changes, Upgrades, Process Improvement
Retirement or Replacement
Idea
Law Developed (Bill Written and presented to legislature)
Bill Evaluated, Debated
Bill Voted on and Approved
Law Becomes Statute
Law is Enforced
Law Reviewed
Law Revised or Retired

SE Process Applied to the Law Making Process

- **Minimizes Risks**: improves project transparency and project control.
- **Improves Quality**: ensures that the results to be provided are complete and have the desired quality.
- **Reduces Total Cost**: costs of development, production, operation and maintenance of a system can be estimated and tracked by applying a standardized process model.
- **Improves Communication between Stakeholders**: standardization of elements and terms is basis for the mutual understanding between all stakeholders.


Information Reference Model
1. Strategic View
1.1 Vision
1.2 Capabilities
1.3 Program Management
1.3.1 Stakeholder Management
1.3.1.1 Government Entities
1.3.1.2 Representative-Senator/Assembly Member
1.3.1.3 Consumers
1.3.1.4 Organizations
1.3.1.5 Citizens
1.3.2 Project Management Framework
1.3.3 Projects
1.4 Analysis of Alternatives
1.5 Business Case Analysis
1.6 Risks
2. Operational View
2.1 Missions
2.1.1 Use Case
2.1.2 Activities
2.1.3 Actors
2.1.3.1 Authors
2.1.3.2 Senator
2.1.3.3 Assembly Member
2.1.3.4 Committee
2.2 Decision Support
3. System View
3.1 Statements
3.1.1 Physical_Entities, Instances
3.1.2 Functions
3.1.2.1 Services
3.1.3 Requirements
3.1.4 Constraints
3.1.5 Standards
3.1.6 Best Practices
3.1.6.1 Policies
3.1.6.2 Regulations
3.1.6.3 Studies and Reports
3.1.7 Domain Knowledge
3.1.8 Interfaces
3.1.9 Trade-offs
3.2 Logical Entities
3.3 Verification & Validation

Information Reference Model

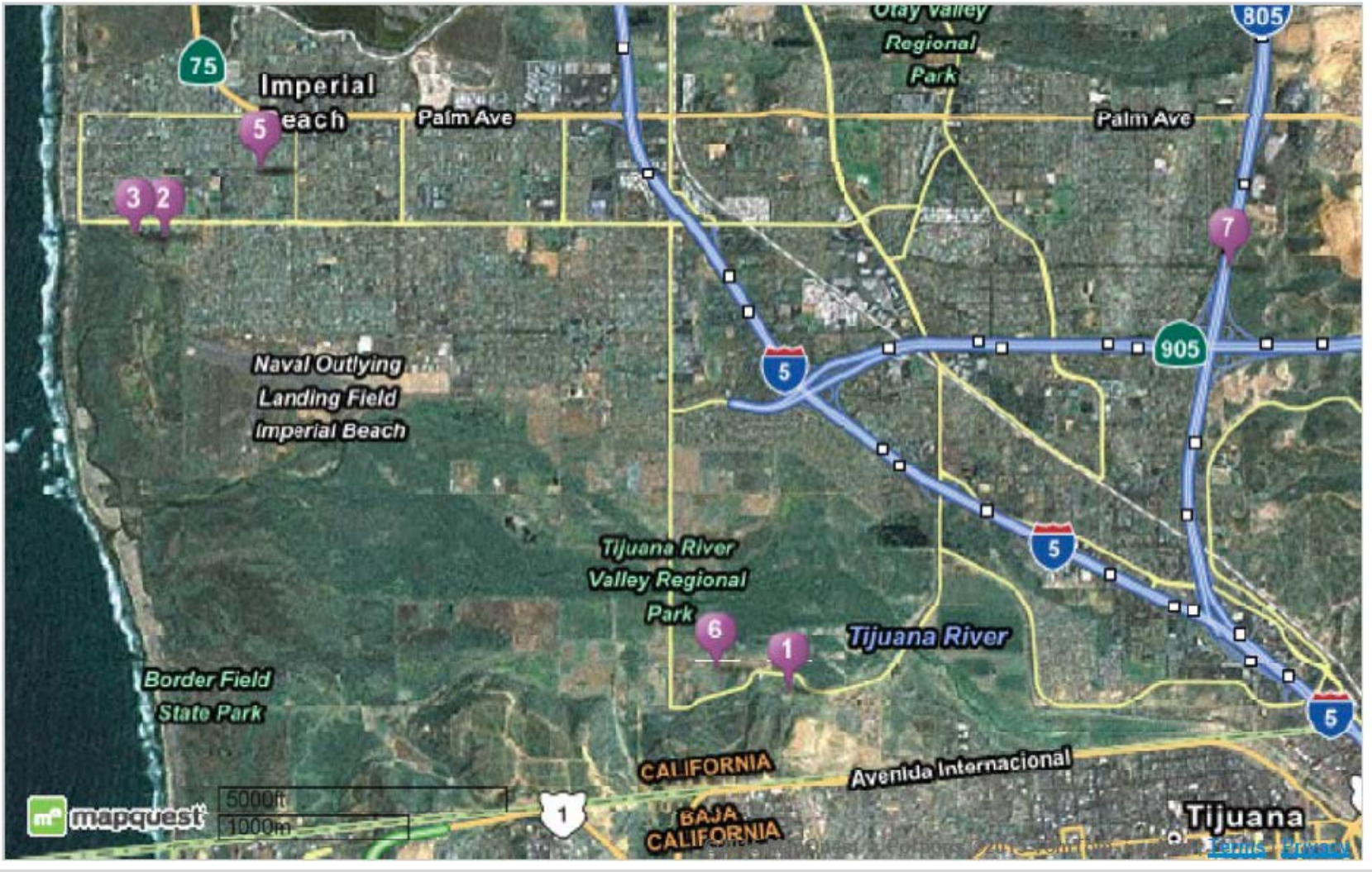
- Facilitates the following:
  - Planning, managing, implementing, and executing processes
  - Developing and maintaining common understanding of enterprise
  - Scalable to changing requirements
  - Tracking of product development (quality control) and process improvement (quality assurance)
  - Reduces complexity

Case Study

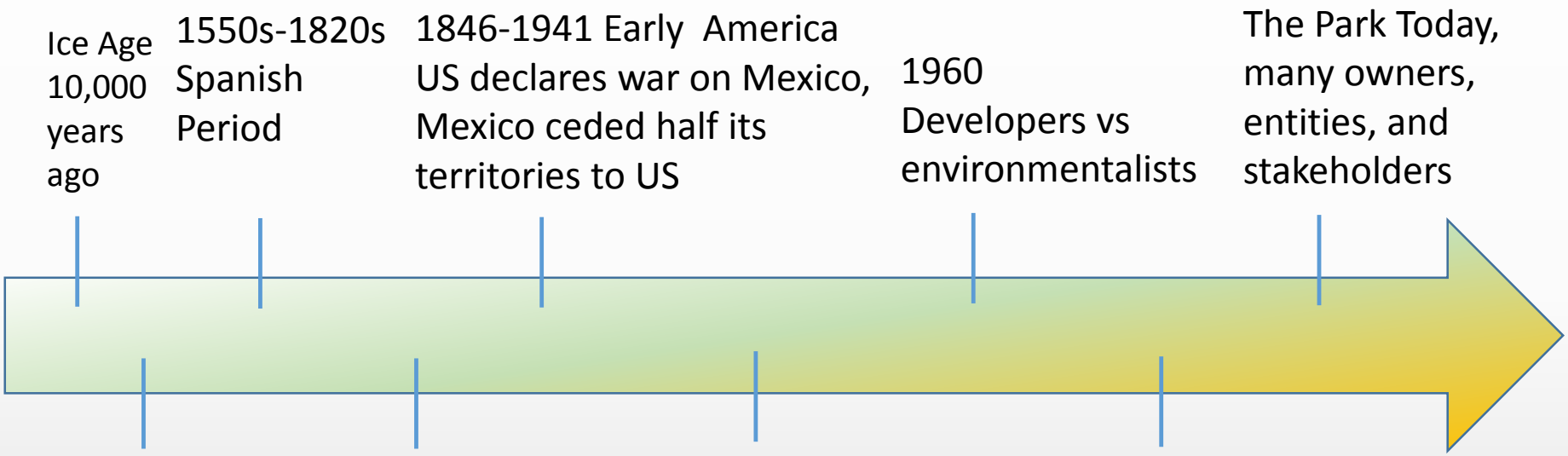
- Tijuana River Valley– Laws in motion, laws in conflict

Photo by Chris Stone

Tijuana River Valley and Vicinity



History of the Tijuana River Valley



Leveraging the Legislative Process

- California voters approved money for Border Field's acquisition as a state park in a 1964 Bond Act
- Passage and Enforcement of Endangered Species Act, Clean Water Act, California Coastal Act
- Finally, environmentalists could use legislation to prevent efforts to turn the Tijuana River into a concrete channel.

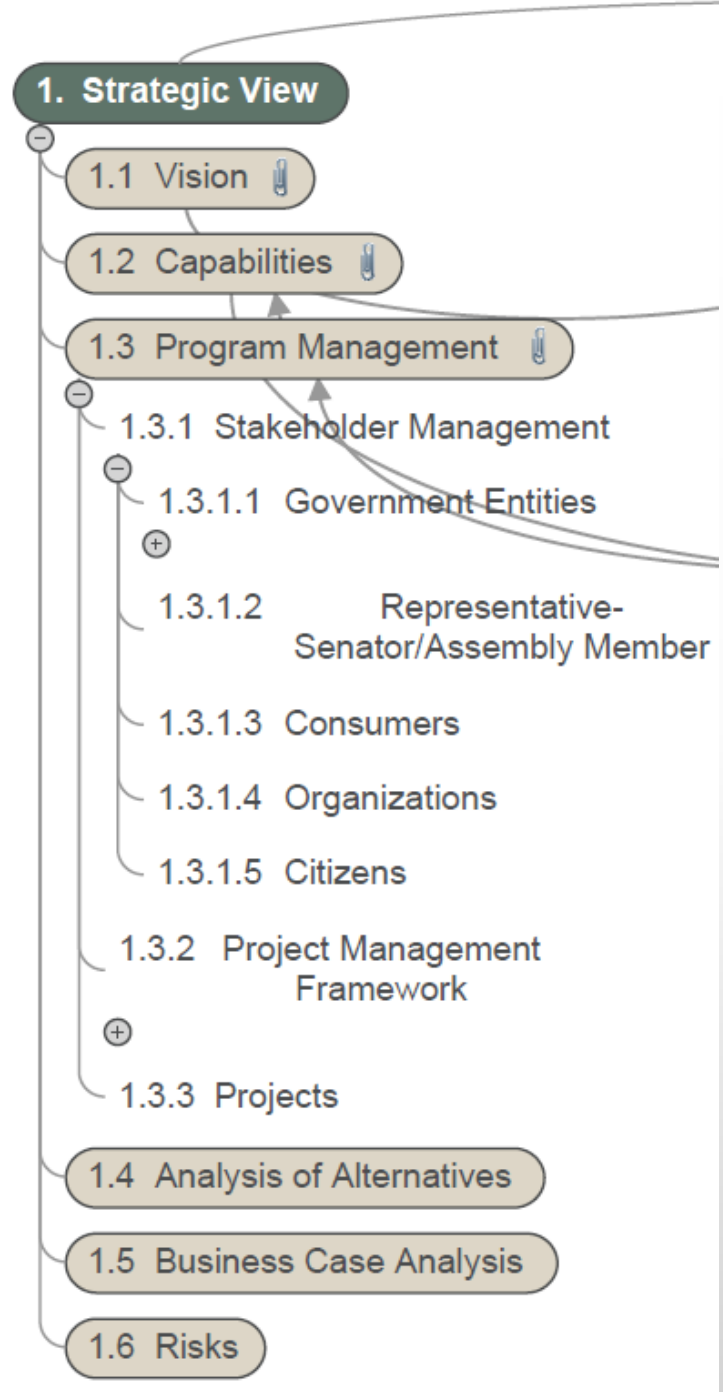
But Nature keeps coming back attempting to change the landscape

Tijuana River Watershed

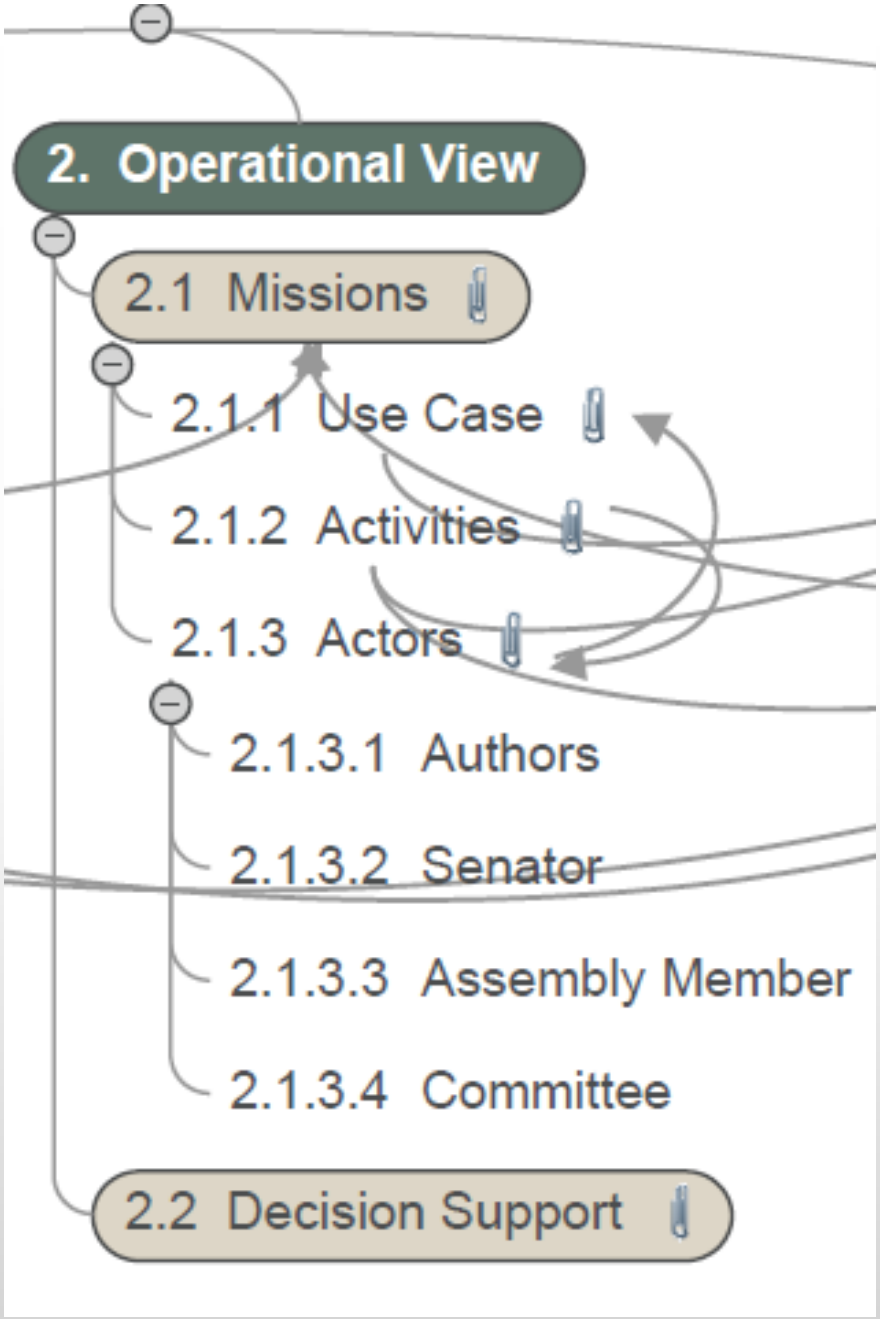
1,700 sq-mi watershed | 27% in US 73% in Mexico | Q100 = 75,000 cfs | Q10 = 17,000 cfs

Annual Rainfall: | 10 inches/year at coast | 25 inches/year in mountains

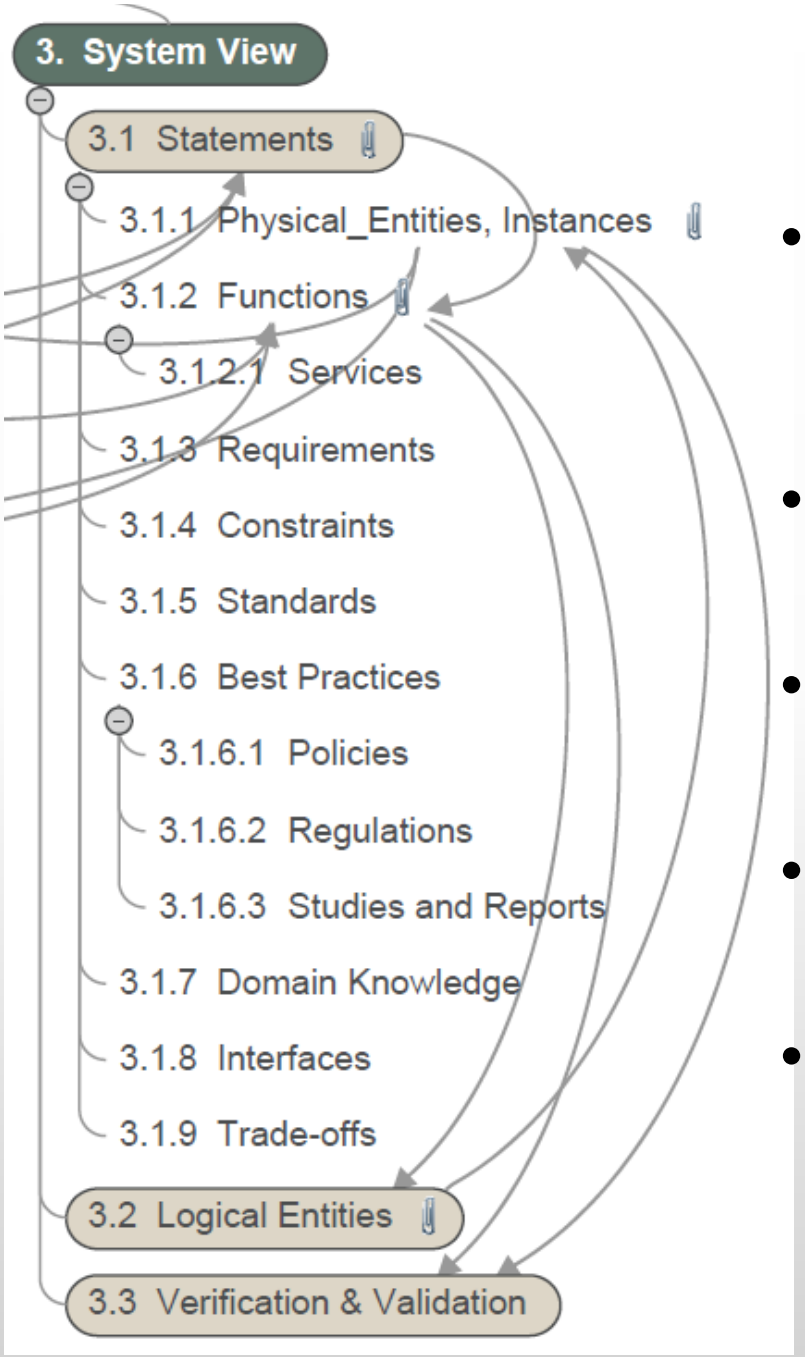
Who's Responsible?



- Stakeholders-identify and managing them, developing effective communication
- Understand the problems and the solutions and help to achieve vision of a healthy Tijuana River Watershed
- AoA-Source control and pollution prevention activities may be the best and most economical
- Manage Complexity of Cost, Schedule, Scope, Risk, Quality-spread across multiple projects and organizations



- Missions - Focus on successfully reducing the sediment and trash
  - Partner with Mexico to implement optimum, watershed-based solutions
  - Understand how water, sediment and trash flow
  - Reduce sources of sediment and trash
  - Implement sediment and trash capture in watershed
  - Fund and perform ongoing operations and maintenance (O&M)
  - Involve and inform community in Mexico and United States
  - Protect and enhance natural resources



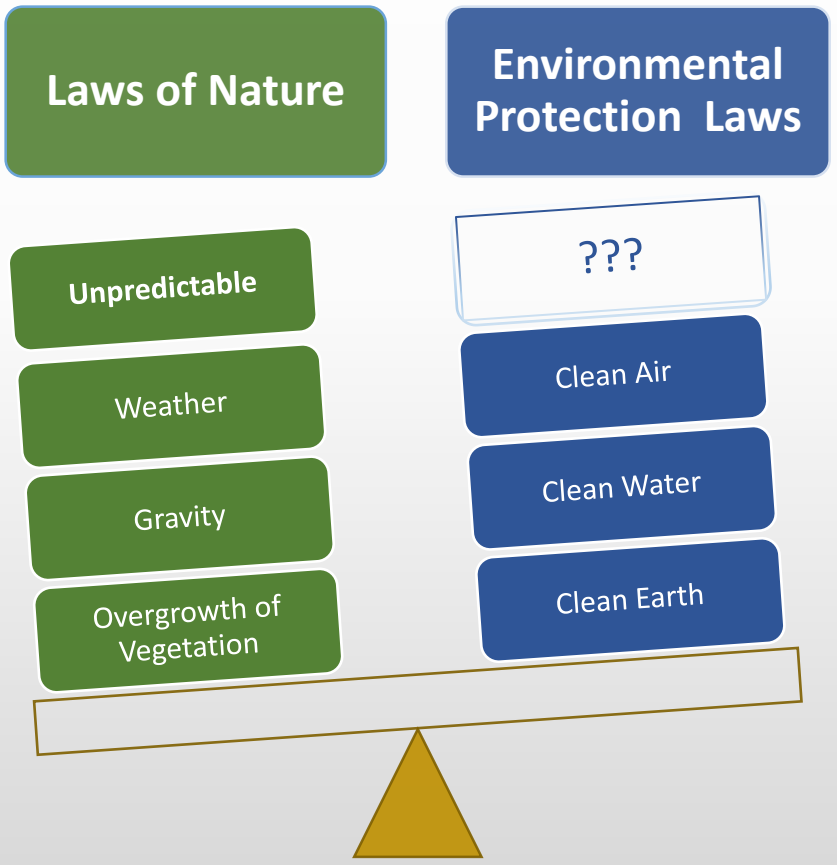
- Resolution to the sediment and trash problem requires partnerships.
- Manage interfaces, relationships, and dependencies
- Implement and integrate processes, standards and policies
- Implement efficiencies where possible
- Manage and track intertwined and interconnected systems and subsystems requirements and constraints

Can We Balance These Systems?

Missions

Complex Relationships

Many interfaces



Dependencies

Constraints

Conflicts