An approach to Robust Optimization of Large Scale Complex River System

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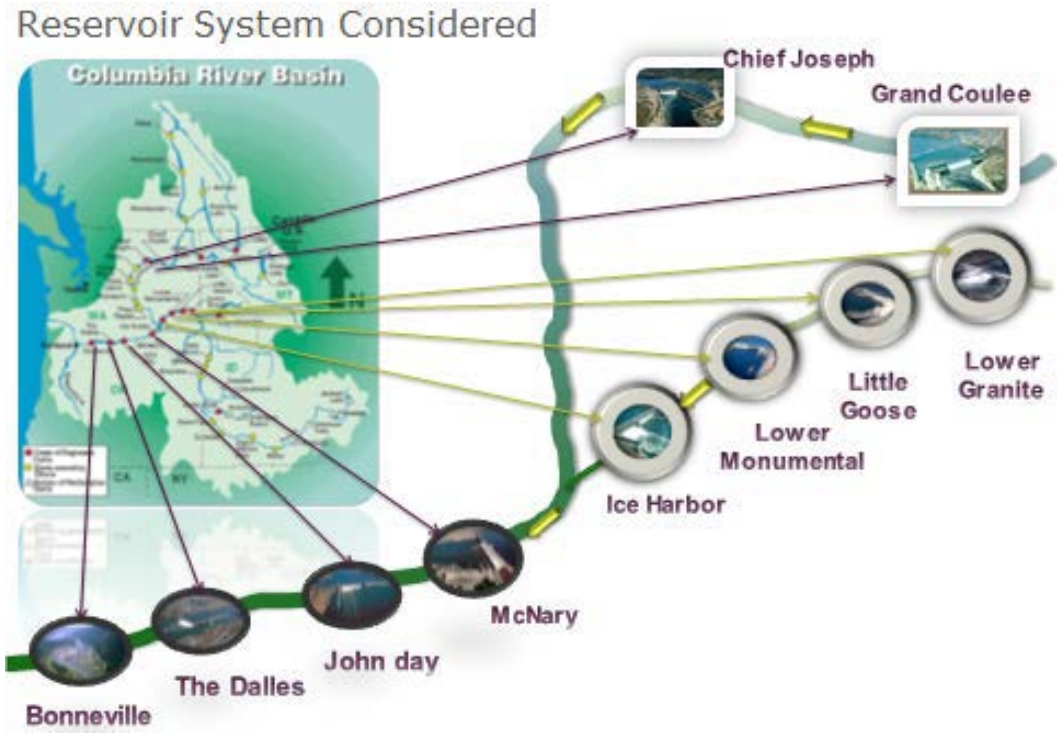
ST 541 Project

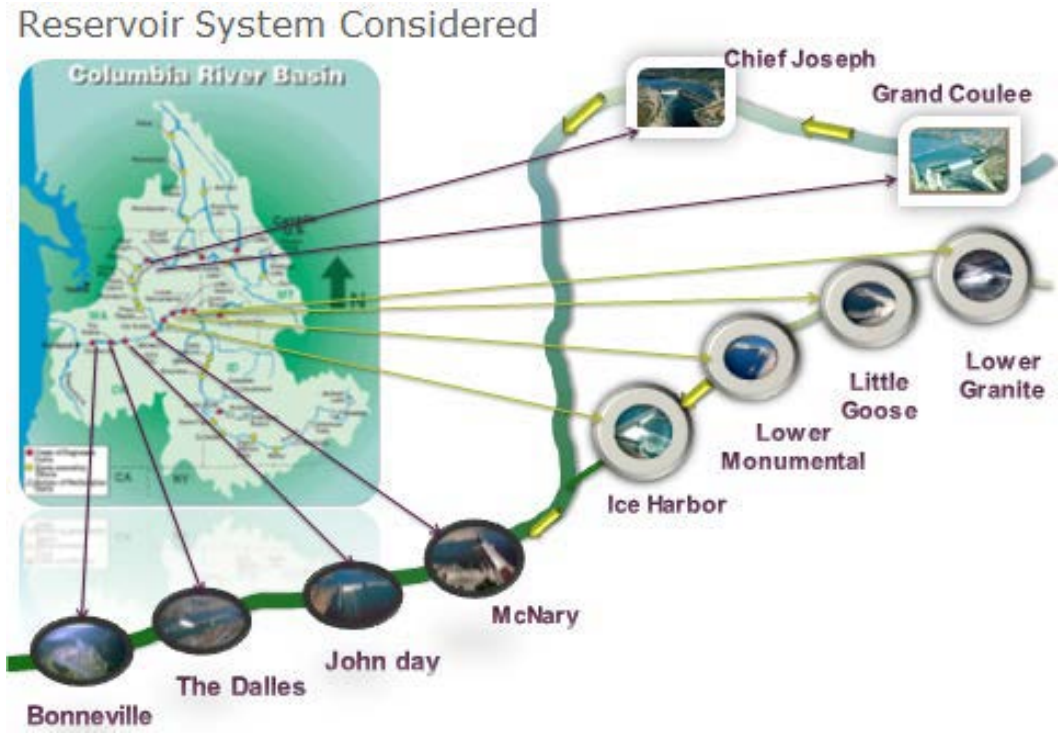
28th Nov, 2018

GitHub Link: https://github.com/ST541-Fall2018/arpanbiswas52-project-ComplexRiverSystem

Hydro energy generation problem



Hydro energy generation problem



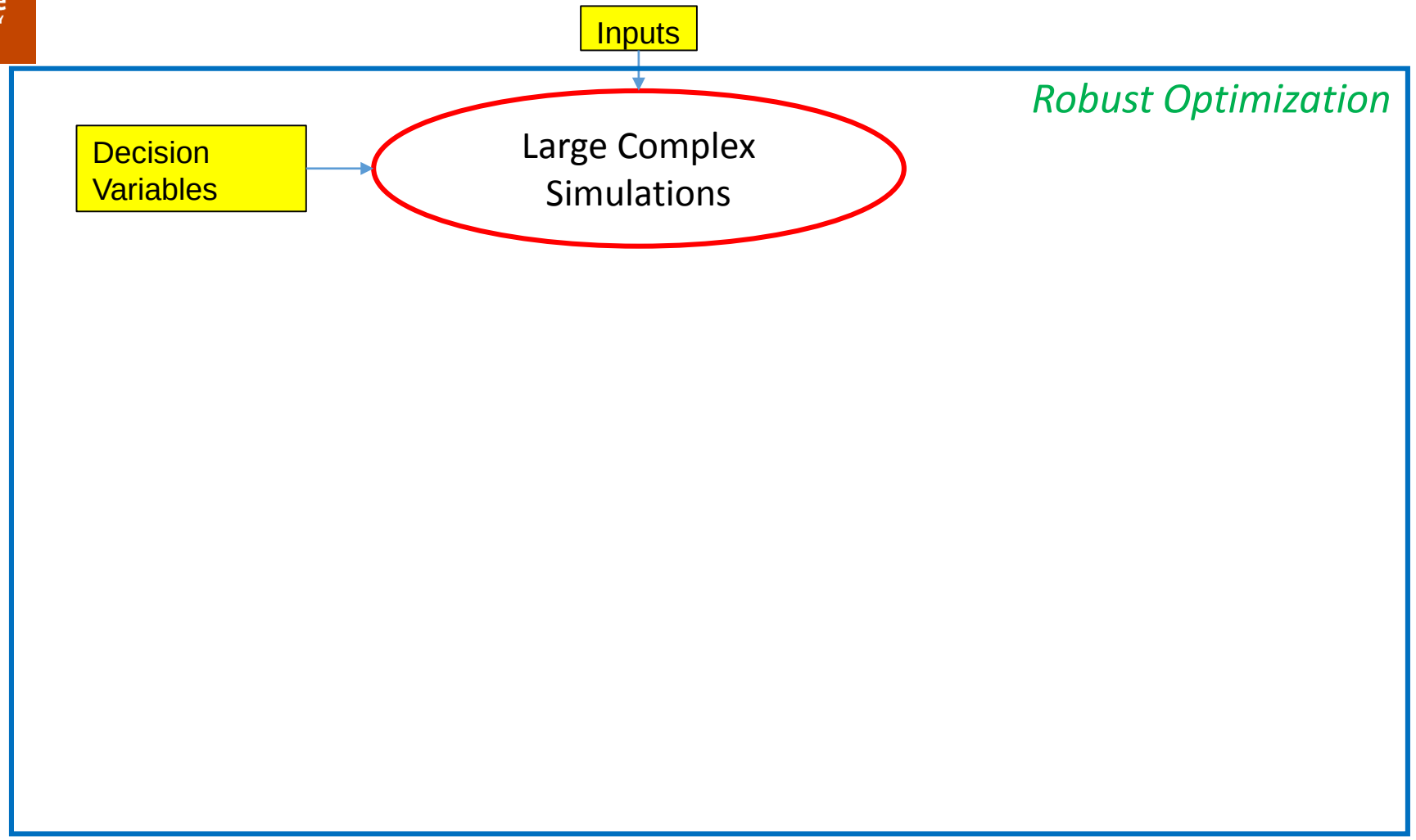
Goal:

- **Efficient Uncertainty Quantification** of Inflows, Prices etc.
- **Robust Decision** of Optimal Energy Allocation.

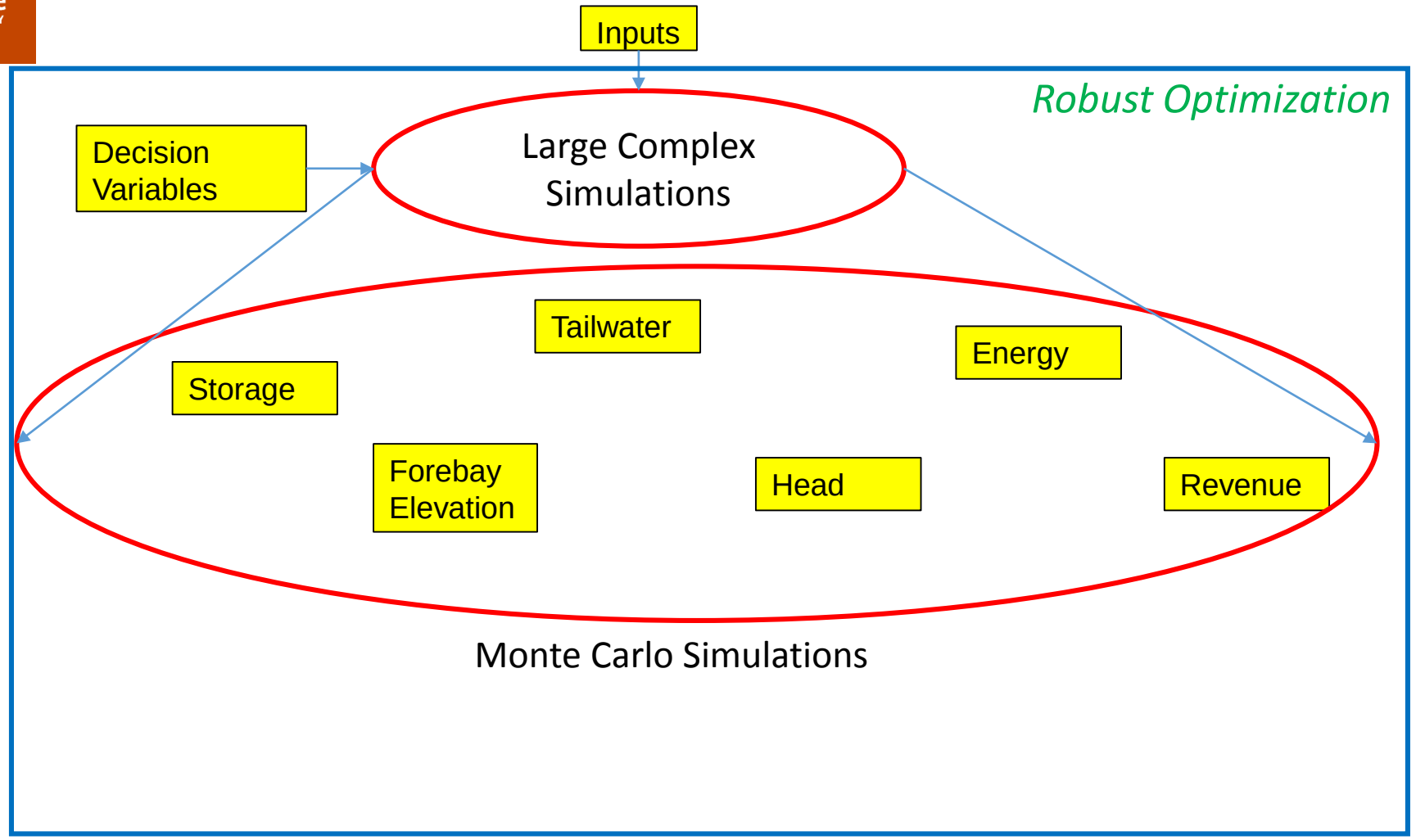
Optimization Model Framework

Inputs

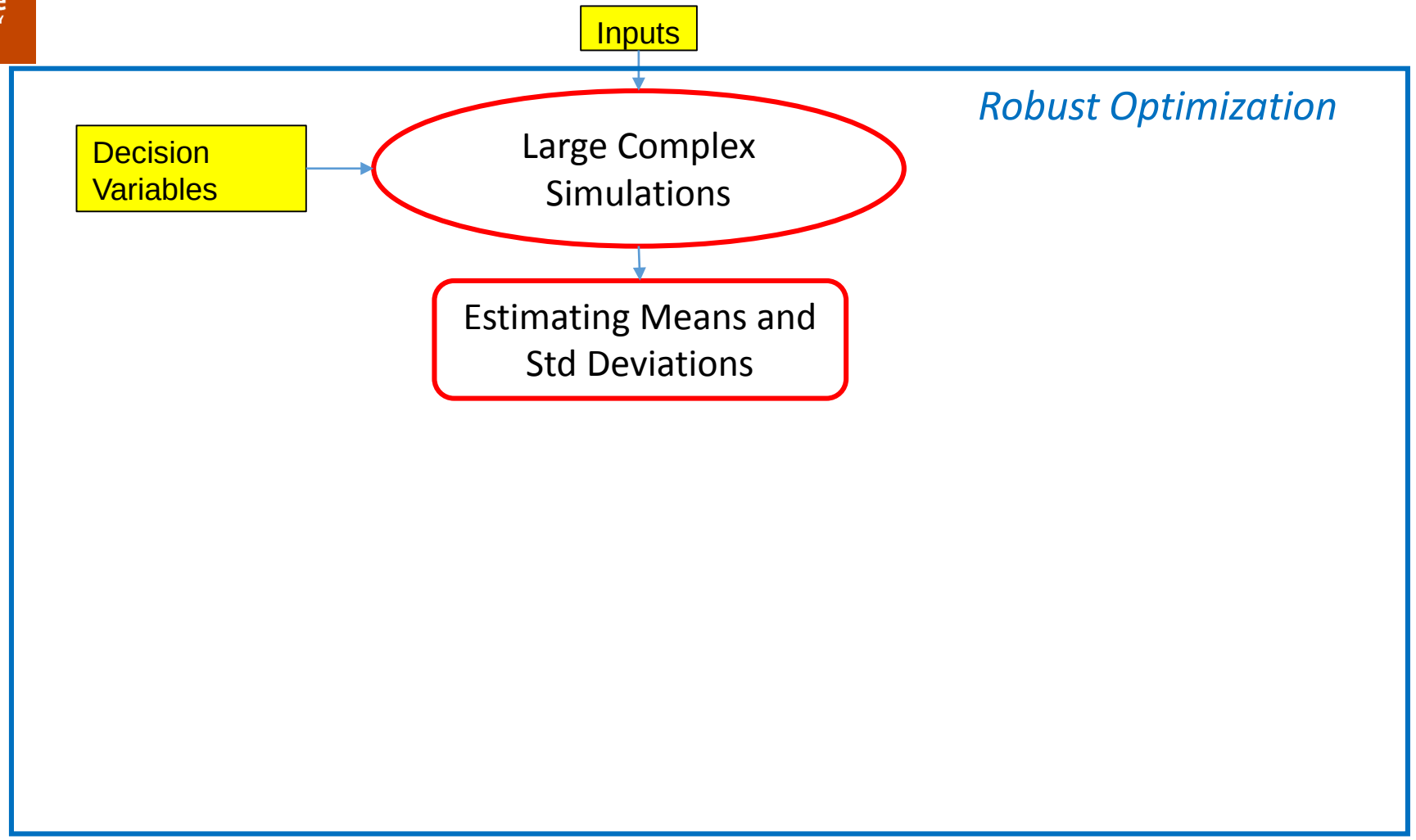
Optimization Model Framework



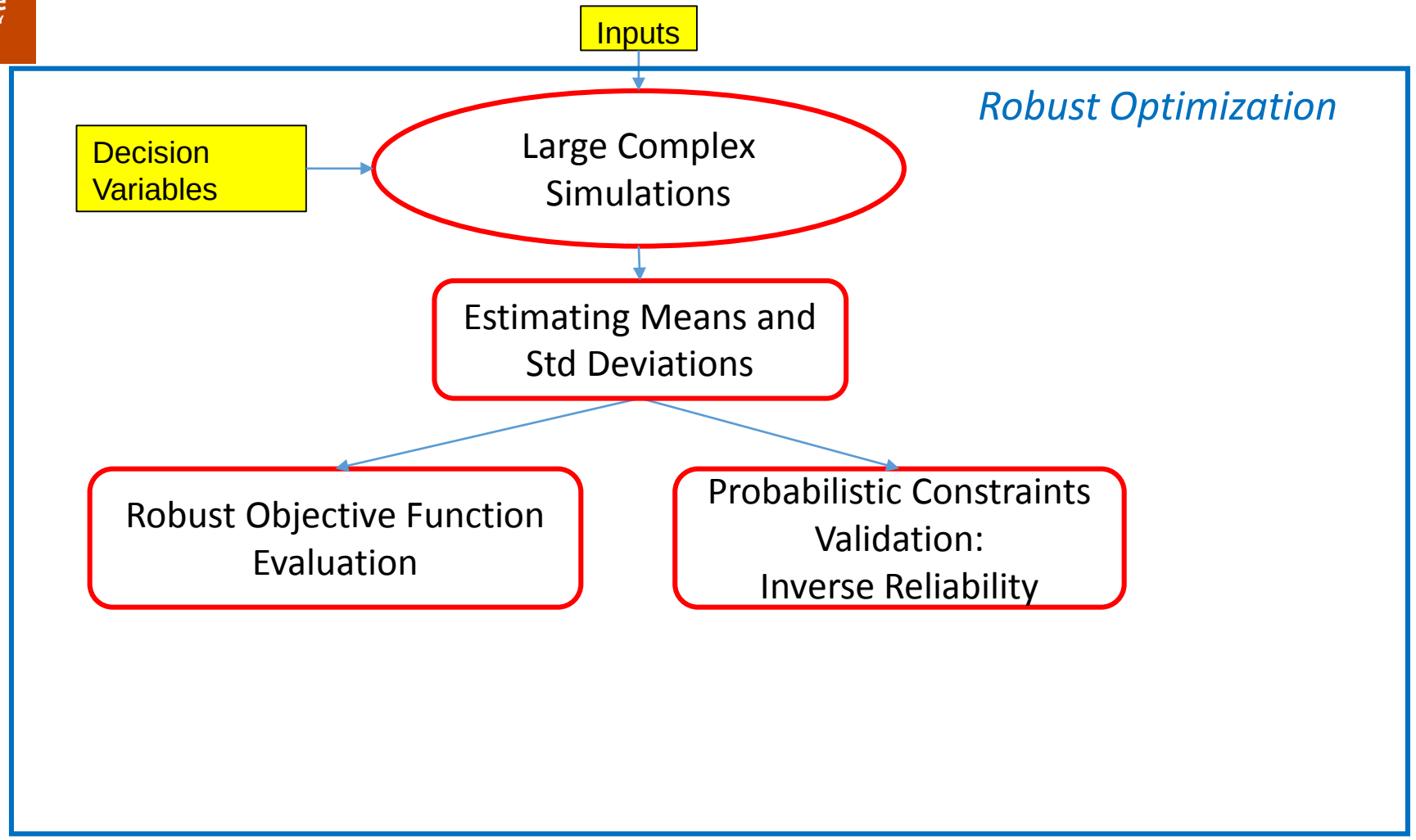
Optimization Model Framework



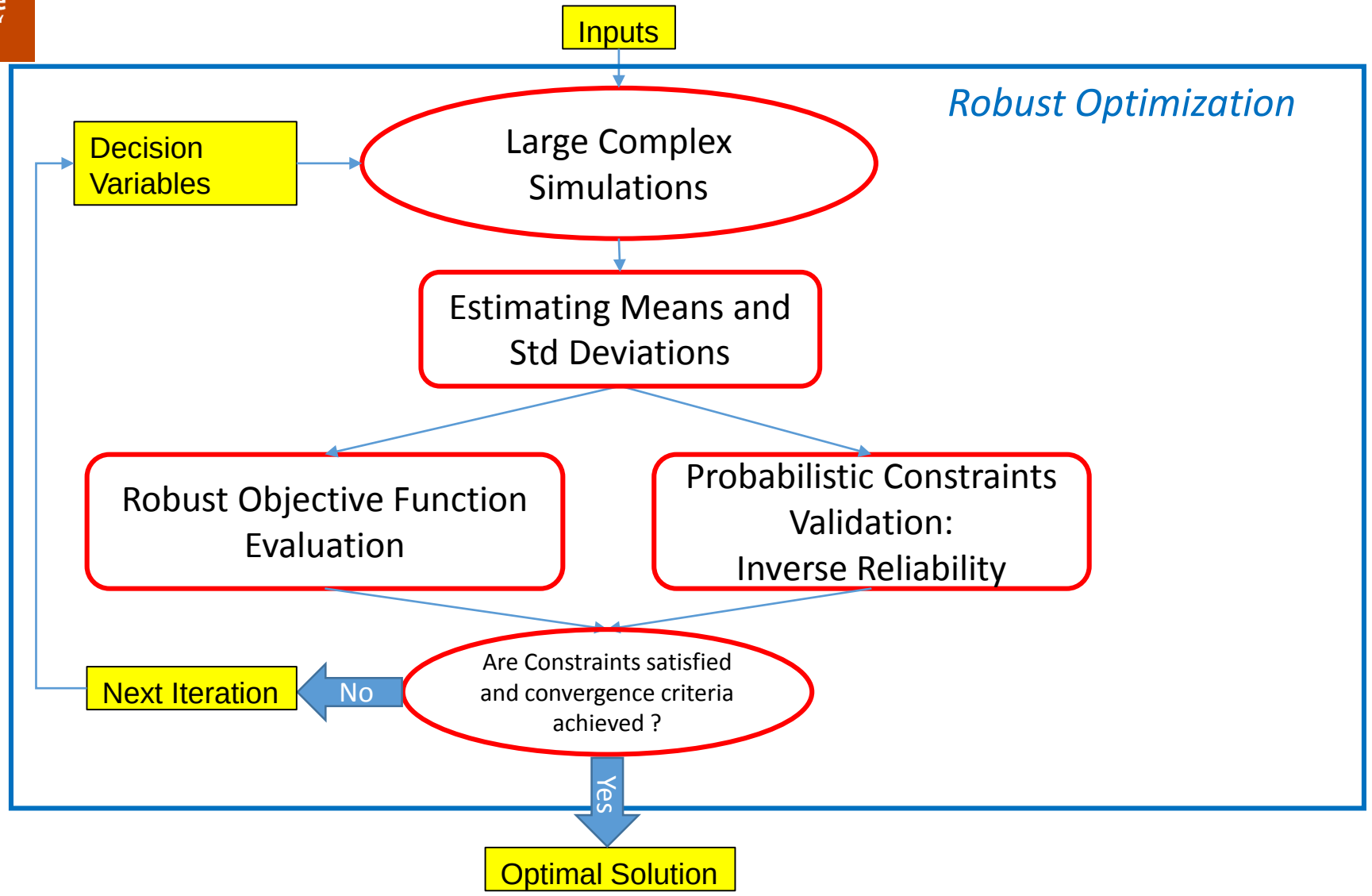
Optimization Model Framework



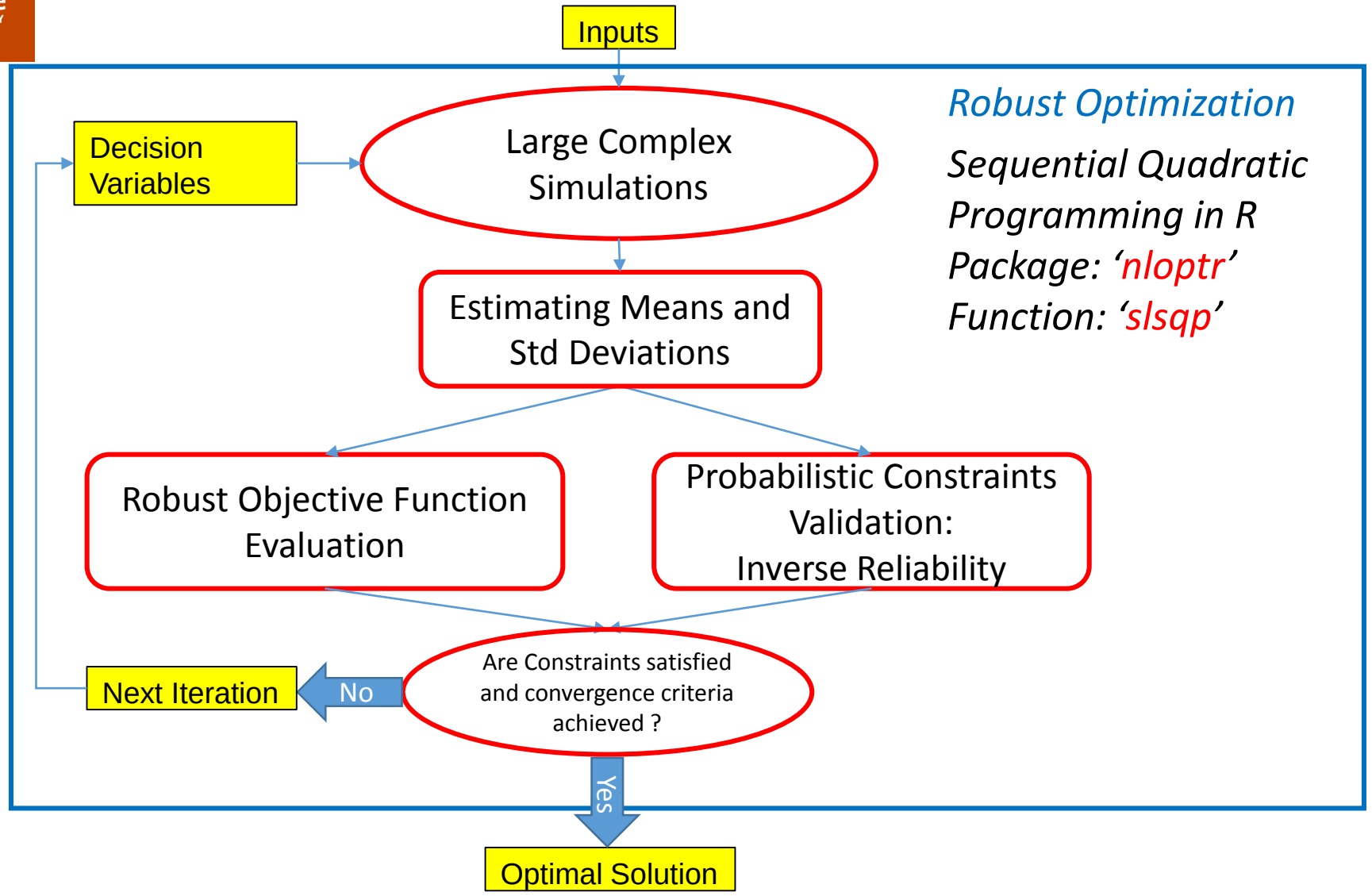
Optimization Model Framework



Optimization Model Framework



Optimization Model Framework



RESULTS

Reservoirs: Grand Coulee, Lower Granite and McNaire

Challenges

Challenges

- **Antithetic Variable Approach** for efficient UQ and better decision

COMPARISON

	MC approach	Antithetic Approach
No. of simulations	500 / 62500 (for Revenue only)	100/ 10000 (for Revenue only)
Run-time per iterations (approx.)		
Revenue (at optimal sol.)		

Thank You!!!

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