

CALIFORNIA DEPARTMENT OF WATER RESOURCES

# A WRIMS Carol

2025 CWEMF Annual Meeting, 13 May 2025



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# WRIMS User Functionality Survey

WRIMS 2.2 User Functionalities



# Outline

- Background
- WRIMS of Past
- WRIMS of Present
- WRIMS of Future
- Acknowledgement



# Background: What is WRIMS

- Water Resources Integrated Modeling System
- Developed and maintained by DWR and Reclamation
- Generalize model platform - Users develop application studies in WRIMS

A screenshot of an Eclipse IDE window titled 'IDE - 9.3.1\_danube\_adj/Run/mainCS3\_ReOrg\_UWplusVF.wresl - Eclipse Platform'. The main editor displays the following code:

```
! MAIN WRESL FILE FOR CALSIM3 Merged Sac/SJR  
  
•initial {  
  svar RUFmax {value 0.0}  
  
  !*****SWITCHBOARD*****  
  !Planning horizon  
  svar LODflag {value 0.} !0 for existing conditions (historical/valid  
  svar ICC {value 1.} !HYDROFORECAST DLL option: 0 = historical fo  
  
  !WQ certifications MIFs or Old FERC Licenses (Default: 0 for existing values,1 for New  
  svar P2088_WQCFflag {value 0.} !FERC Project P-2088  
  svar P2105_WQCFflag {value 0.} !FERC Project P-2105  
  svar P619_WQCFflag {value 0.} !FERC Project P-619  
  svar P803_WQCFflag {value 0.} !FERC Project P-803  
  svar P2266_WQCFflag {value 0.} !FERC Project P-2266  
  svar P2246_WQCFflag {value 0.} !FERC Project P-2246 (issued in July 2020)  
  
  !Modeling domain  
  svar simulateUpperFeather {value 1.}
```

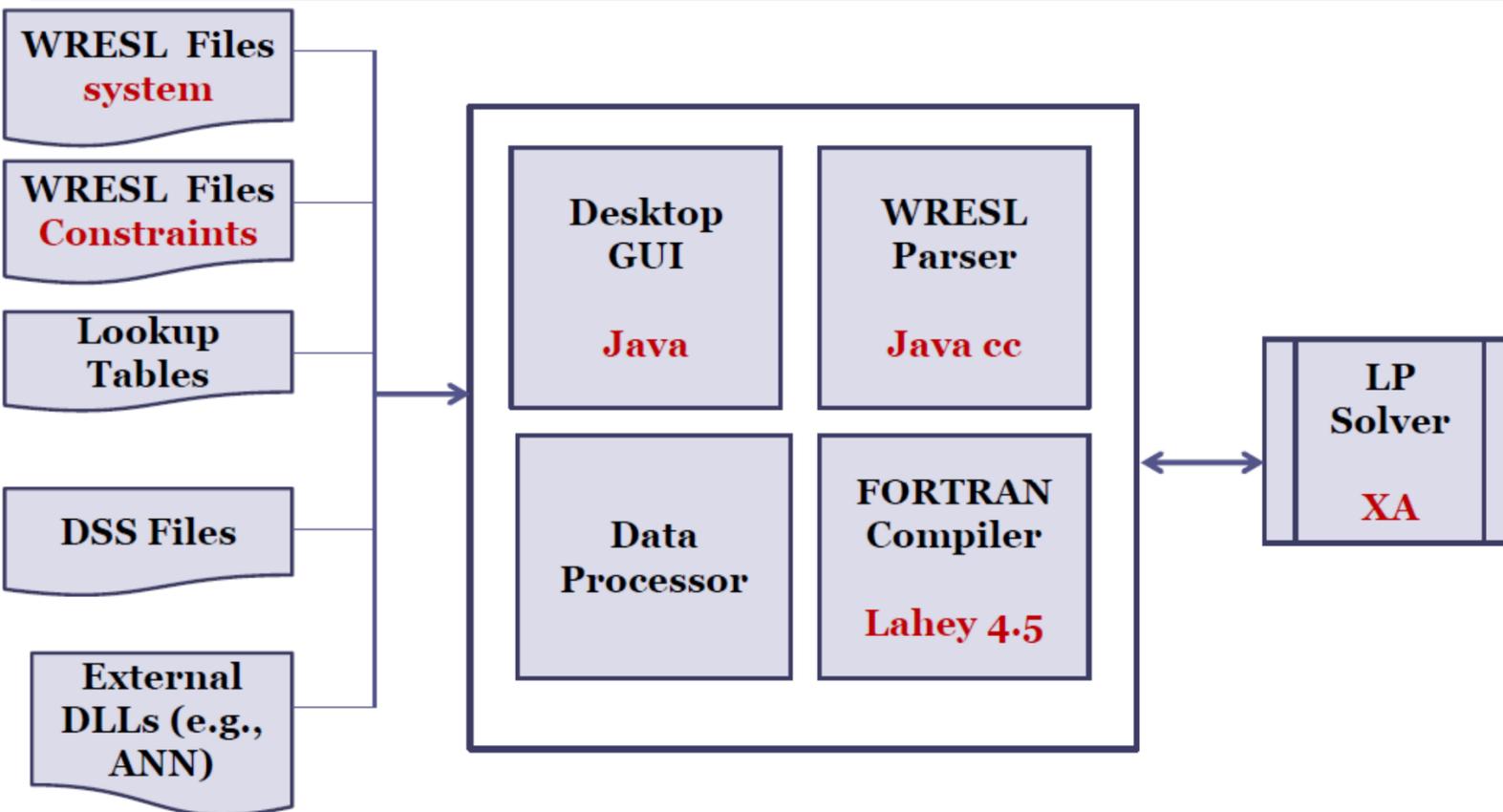
The IDE interface includes a menu bar (File, Edit, Navigate, Search, Project, DSS, Data, Run, Window, Help), a toolbar, a Project Explorer on the left showing a tree view with 'Wresl', 'initial', 'GenTables', 'SWPForecast', 'Forecast2', 'UPPERFEATHER', 'YUBABEAR', and 'LOWERYUBA', and a Console at the bottom with the message 'No consoles to display at this time.'

# WRIMS of Past

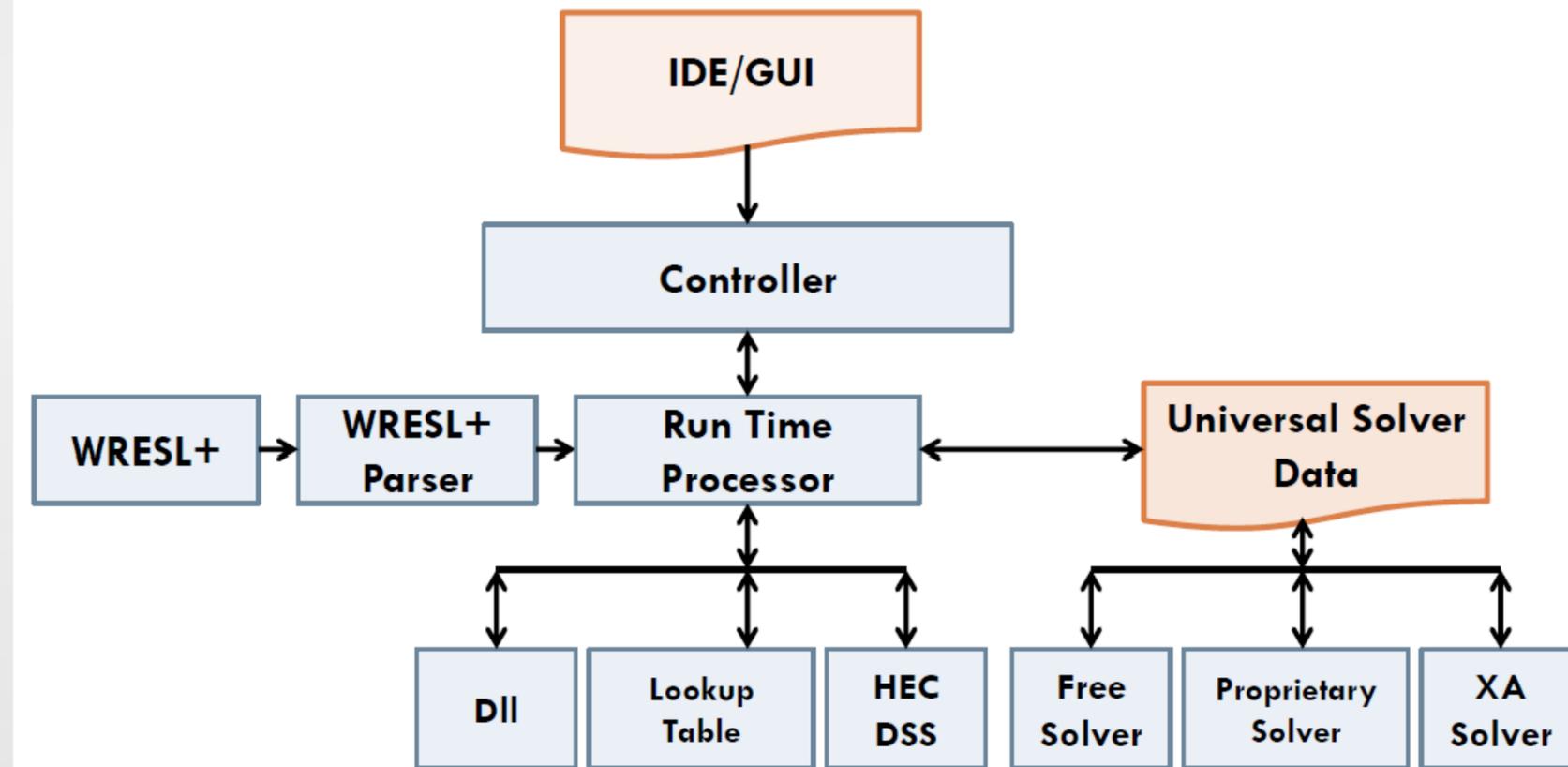
Discussion on proposed development of WRIMS 2.0 as early as 2005. (Booher, Wilbur and Pruitt, 2005)

- Release of CalSim1.0 in 1999.
- Release of Multi-Study runner in 2001.

## Water Resources Integrated Modeling System 1.0



## Water Resources Integrated Modeling System 2.0



Pre 2005



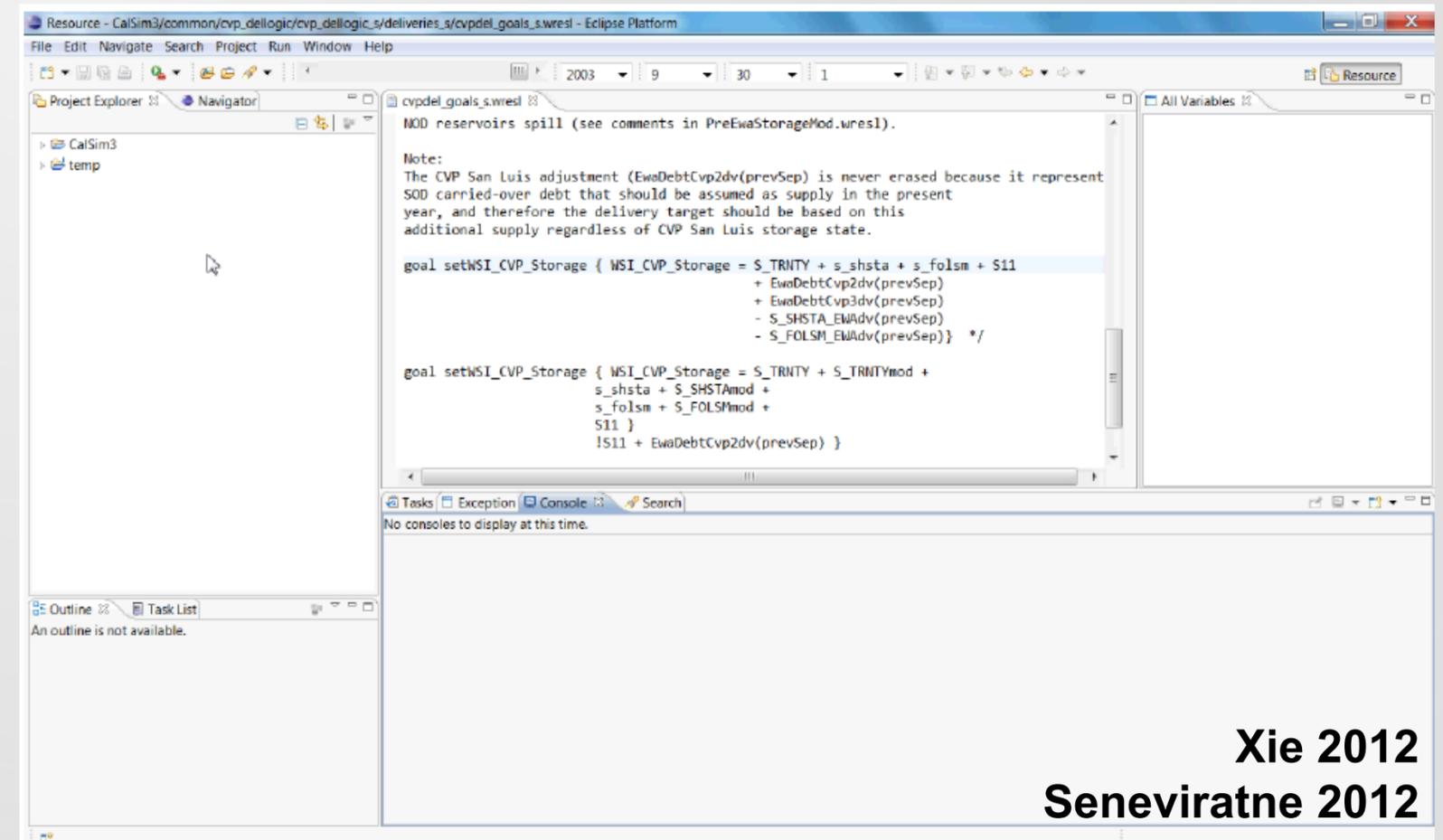
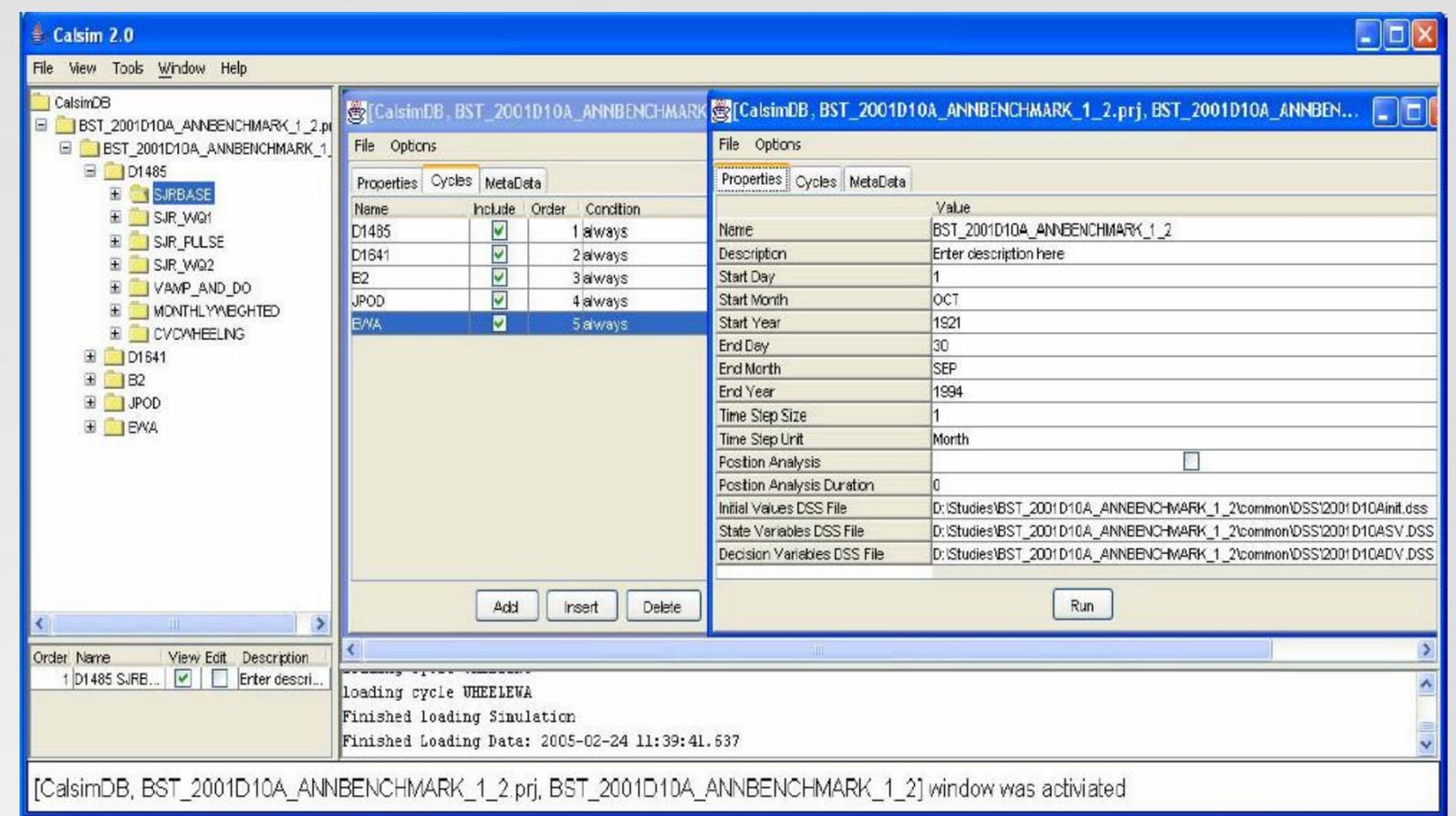
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Hao 2012  
Seneviratne 2012

# WRIMS of the Past

## Key Changes From WRIMS1 to WRIMS2

- Eliminate Fortran Compiler
- Transparent architecture design with engine at the center
- Full Java implementation eases integration with Java Based GUI
- Run time reduction (by ~66%)



# WRIMS of Present: WRIMS 2.2

The screenshot shows the Eclipse IDE interface. The main editor displays a WRESL file named 'mainCS3\_ReOrg\_UWplusVF.wresl'. The code includes comments and variable declarations for various parameters. The Outline view on the left shows a tree structure with 'Wresl' as the root, containing 'initial', 'GenTables', 'SWPForecast', 'Forecast2', 'UPPERFEATHER', 'YUBABEAR', and 'LOWERYUBA'. The Console window at the bottom shows 'No consoles to display at this time.'

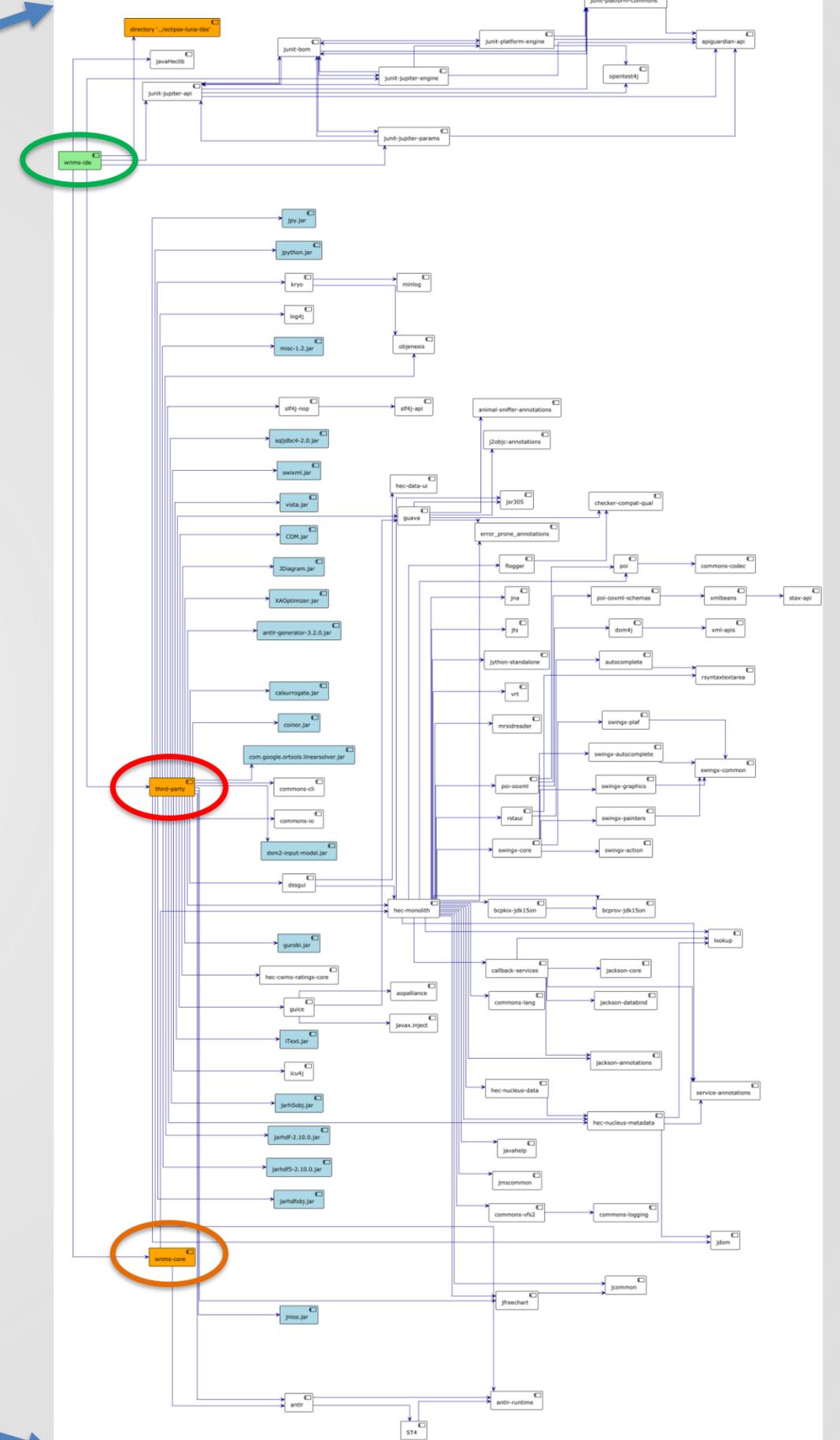
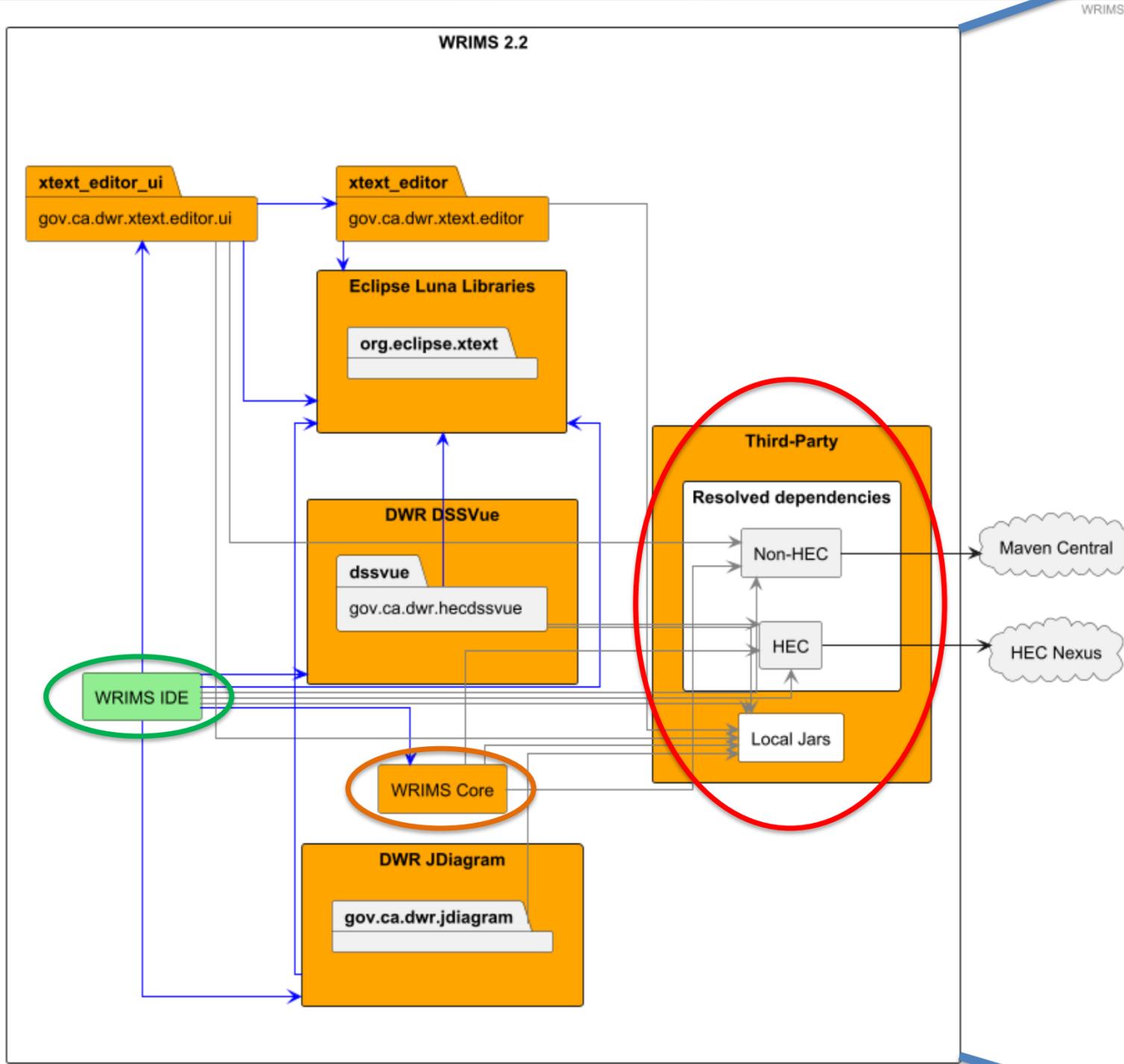
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  svar simulateUpperFeather {value 1.}
```

- Import/load existing studies
- Edit WRESL+ files
- Run/Debug
- View DSS
- View Schematic

Poll Results



# Peek Under the Hood



# WRIMS of Future: WRIMS3

## Continuing philosophy of:

1. Incorporating relevant cutting-edge technology – Infrastructure Updates
2. Efficient system maintenance
3. Improving user experience – User case-based framework

### Need for Infrastructure updates. The current version of WRIMS uses:

- Java 8
  - 16 newer versions
  - Support ends\* in 2030.
- Eclipse Luna
  - 31 newer versions have been released.
  - Luna does not support newer versions of Java.

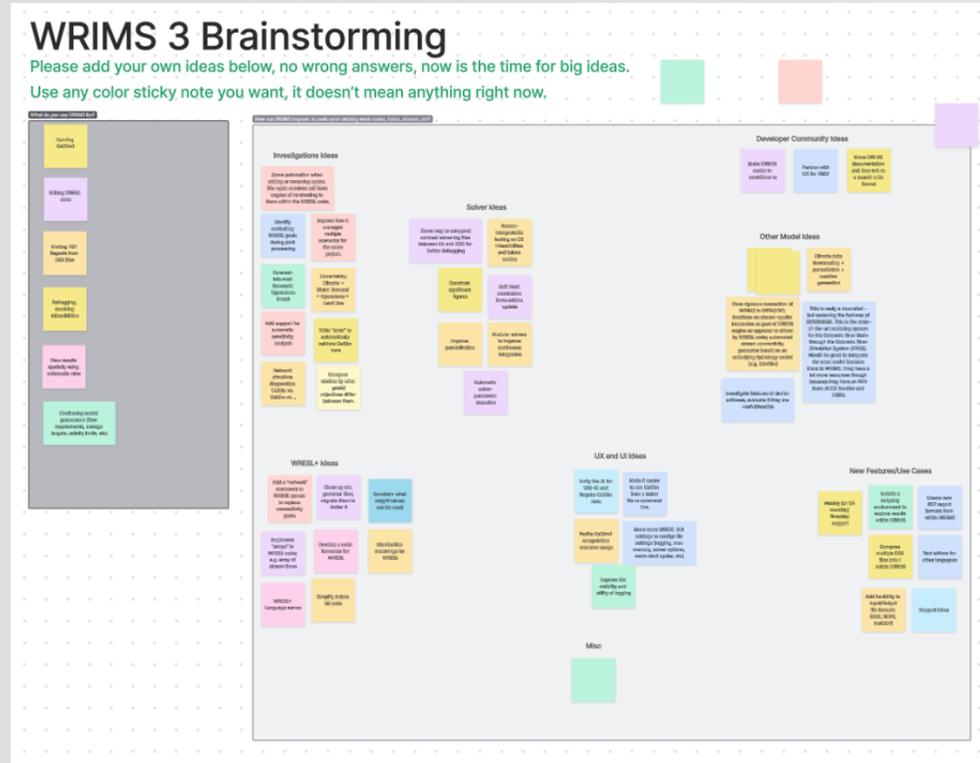
### Proposed Changes for Efficient System Maintenance:

- WRIMS internal structural reorganization
- DevOps Framework
- Curate dependencies and libraries



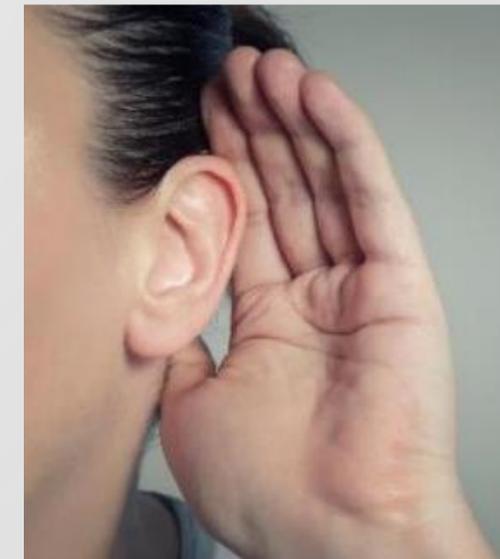
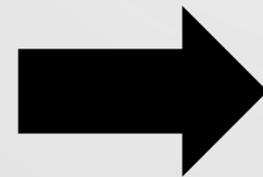
# WRIMS of Future: WRIMS3

## Improving user experience – User case-based framework



- Solver things, like...
  - “Compare/contrast solver log files between XA and CBC for better debugging.”
  - “Human-interpretable testing on CalSim infeasibilities and failure modes.”
- WRESL+ things, like...
  - “Update the WRESL+ documentation.”
  - “Clean up the grammar files.”
- UI and UX things, like...
  - “Make it easier to run CalSim from a batch file or command line.”
  - “Unify the UI for WSI-DI and Regular CalSim runs.”

Vote during upcoming CalSim User Group Meeting in Jun 2025.



# WRIMS Products

<https://data.cnra.ca.gov/dataset/wrims-2-gui>

## Your one stop shop to:

- Latest WRIMS releases
- WRIMS GUI Quick Start Guide
- WRIMS GUI Demonstrations
- WRESL+ Language Reference

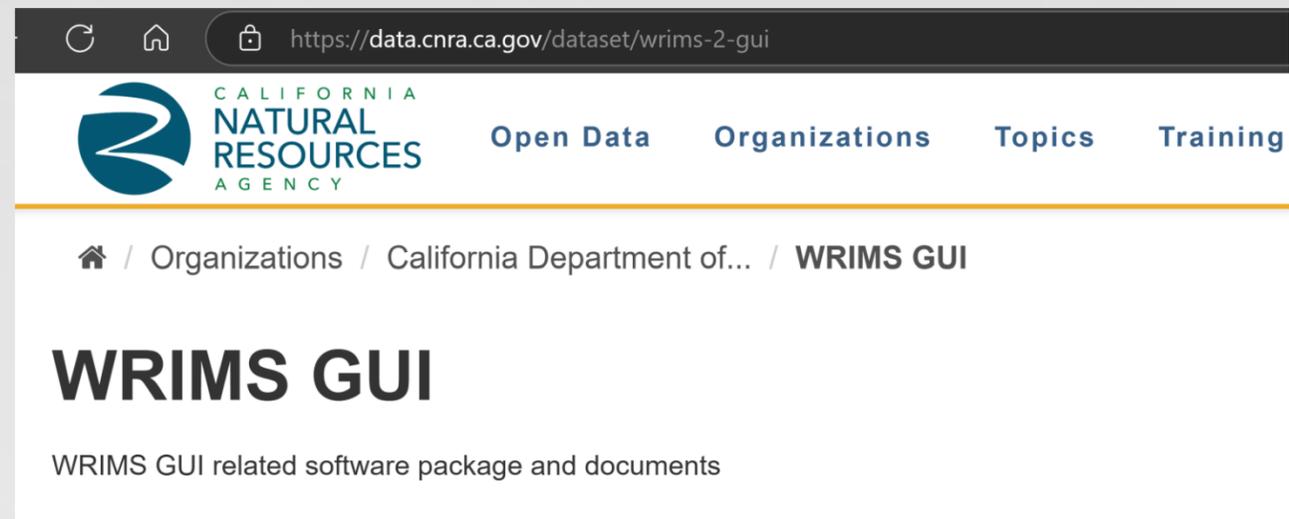
# Acknowledgement

## DWR

- Nazrul Islam
- Nicky Sandhu
- Hao Xie
- Zachary Roy
- Can Dogrul

## RMA

- Peter Morris
- Deziree Dizon
- Tom Evans
- Josh DeGeorge



To subscribe to WRIMS User Group please send email to:  
[wrims\\_development\\_application@water.ca.gov](mailto:wrims_development_application@water.ca.gov)



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# Extra



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# Eliminate Fortran (WRIMS 1 vs WRIMS 2)

