

# DSM2 Learning Series: DSM2 Planning Studies

Session 1: Input pre-processing, running DSM2

The goals for this session include:

1. Running the pre-processor for DSM2 planning studies
2. Plotting input with Jupyter notebook
3. Running DSM2 planning studies

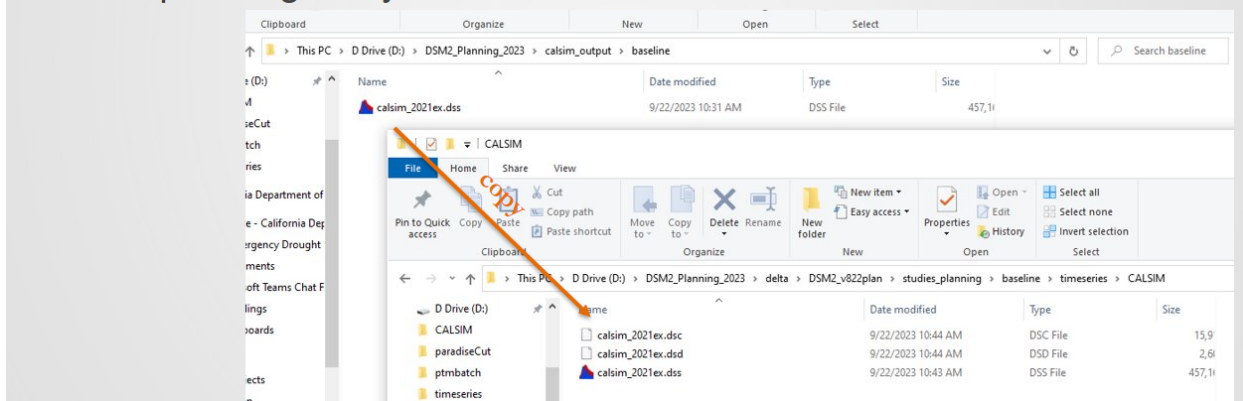
## Instructions

For the baseline and alternative scenarios, copy the CalSim output file for the scenario into the DSM2 planning study folder:

### Running the DSM2 Pre-processor

#### baseline scenario: copy CalSim output to DSM2 folder

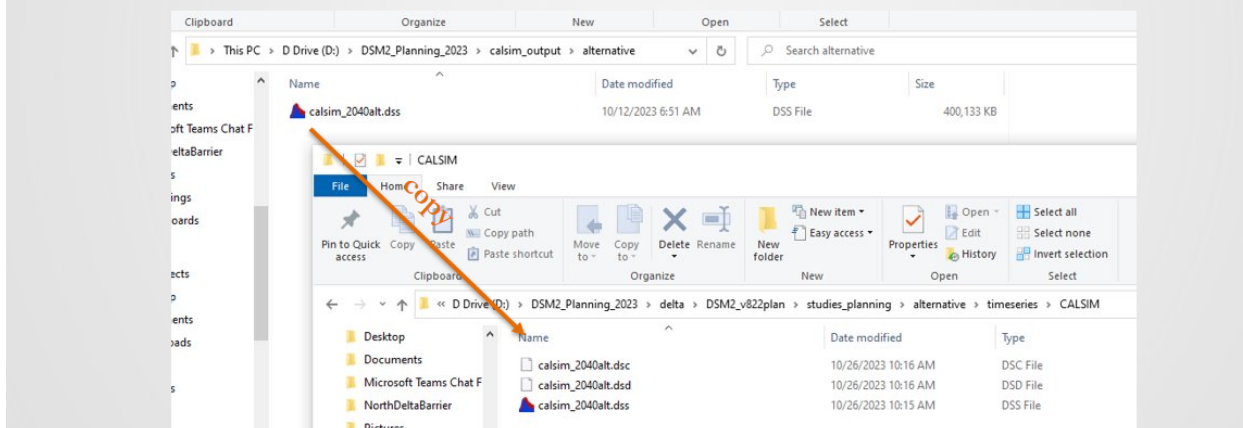
- For the baseline scenario,
  - Copy the CalSim output file for the scenario into the DSM2 planning study folder



### Running the DSM2 Pre-processor

#### alternative scenario: copy CalSim output to DSM2 folder

- For the alternative scenario,
  - Copy the CalSim output file for the scenario into the DSM2 planning study folder



For the baseline and alternative scenarios, execute the following command:  
prepro.bat config.inp

## Running the DSM2 Pre-processor baseline study

- For each scenario (only pre-process one run at a time),
  - Run the pre-processor create DSM2 DSS input
    - Prepro.bat config.inp

Starting the script

```
Command Prompt

D:\DSM2_Planning_2023\delta\DSM2_v822plan\studies_planning\baseline>prepro.bat config.inp

D:\DSM2_Planning_2023\delta\DSM2_v822plan\studies_planning\baseline>if {config.inp} == {} (
echo "usage:  prepro config-file"
```

```
or: python postpro.py *.dss {pathname} {out}.dss
read DSM2 15-MIN output file: timeseries/2021ex.dss
postprocess pathnames:
/DWR/RSAC054/STAGE/01DEC1920 - 01OCT2015/15MIN/HARMONIC_NGVD_20230413/
/DWR/RSAC054/STAGE/01JAN1921 - 01SEP2015/15MIN/PLAN_DETREND_NAVD_20230413/
/FILL+CHAN/RSAC054/EC/01JAN1921 - 01SEP2015/15MIN/PLAN_2021EX/
all process done

D:\temp\DSM2_Planning_2023\delta\DSM2_v822plan\studies_planning\baseline>
```

done

## Running the DSM2 Pre-processor alternative study

- For each scenario (only pre-process one run at a time),
  - Run the pre-processor create DSM2 DSS input
    - Prepro.bat config.inp

Starting the script

```
Command Prompt - prepro.bat config.inp

D:\DSM2_Planning_2023\delta\DSM2_v822plan\studies_planning\alternative>prepro.bat config.inp
Prepro is needed only when the CALSIM file changes.
Extending flows
C_SAC048
```

```
or: python postpro.py *.dss {pathname} {out}.dss
read DSM2 15-MIN output file: timeseries/2040alt.dss
postprocess pathnames:
/DWR/RSAC054/STAGE/01DEC1920 - 01OCT2015/15MIN/HARMONIC_NGVD_20230413/
/DWR/RSAC054/STAGE/01JAN1921 - 01SEP2015/15MIN/PLAN_2040ALT/
/FILL+CHAN/RSAC054/EC/01JAN1921 - 01SEP2015/15MIN/PLAN_2040ALT/
all process done

D:\DSM2_Planning_2023\delta\DSM2_v822plan\studies_planning\alternative>
```

done

Jupyter notebook for plotting model input

Notebook filename	Purpose
2021_example_bnd.ipynb	Compare DSM2 boundary inputs (flow, stage, EC) from multiple scenarios.

## Plotting input with Jupyter notebook

Start the jupyter notebook application, by executing the batch file “notebook.bat”.

The Jupyter notebook application will open in your web browser.

**Plotting input with Jupyter notebook**  
**starting Jupyter notebook application**

1. Use "notebook.bat" to start jupyter notebook
2. Jupyter notebook opens in web browser

The image shows a Command Prompt window titled "C:\> Command Prompt - notebook.bat". The command prompt displays the following commands and output:

```
D:\DSM2_Planning_2023\delta\DSM2_v822plan\postp>notebook.bat
D:\DSM2_Planning_2023\delta\DSM2_v822plan\postp>set PATH=c:\Wind
```

Below the Command Prompt is a screenshot of a web browser showing the Jupyter notebook interface. The browser address bar shows "localhost:8889/tree". The Jupyter interface includes a "Quit" and "Logout" button, and a file list table:

	Name	Last Modified	File size
<input type="checkbox"/>	0		
<input type="checkbox"/>	info	12 days ago	
<input type="checkbox"/>	kernel	8 days ago	
<input type="checkbox"/>	workshop_notebooks	a day ago	
<input type="checkbox"/>	notebook.bat	4 months ago	503 B
<input type="checkbox"/>	readme.txt	14 days ago	237 B

1. Click “workshop\_notebooks”
2. Open the file *2021\_example\_bnd.ipynb*
3. Edit or add lines to point to your study folders

## Plotting input with Jupyter notebook

### Opening a notebook

1. Click “workshop\_notebooks”

2. Open the file *2021\_example\_bnd.ipynb*

Make sure the notebook is loading data files from the correct locations.

Make sure the variable “period93” is set to the 4 year time window from 2020-10-1 to 2014-9-30.

## Plotting input with Jupyter notebook

### notebook configuration

1. Make sure these lines point to your study folders/files

```
# Read in scenarios
dir_plan = '../studies_planning/'
dir2021base = dir_plan+'baseline/'
dir2040alt = dir_plan+'alternative/'

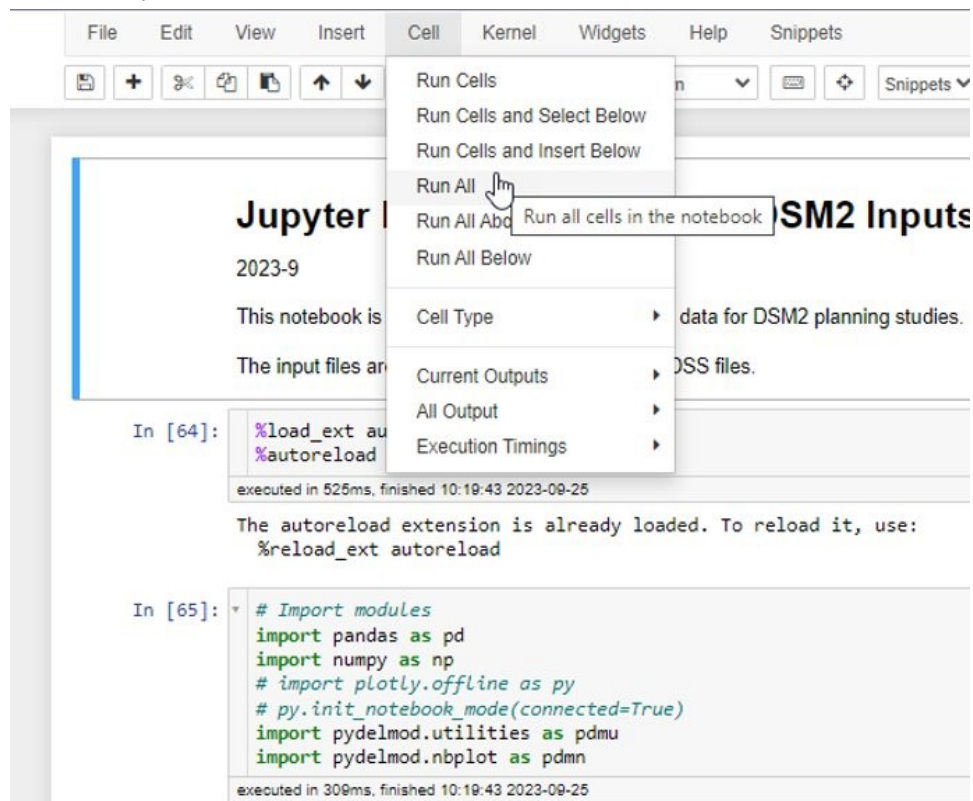
scenarios = [
    {'name': 'baseline', 'fpath': dir2021base+"timeseries/2021ex.DSS"},
    {'name': 'alternative', 'fpath': dir2040alt+"timeseries/2040alt.DSS"}
]

# Add a wateryear type column
wyt_c3f2020 = dir_plan+"baseline/timeseries/CALSIM/calsim_2021ex.DSS"
df_wyt2020 = pdmu.read_calsim3_wateryear_types(wyt_c3f2020)

# period93 = ['1922-10-1', '2015-9-30']
period93 = ['2010-10-1', '2014-9-30']
```

2. Modify for 4 year time period

To run every cell in the notebook, select *Cell-Run All*.



Some plots allow you to select a different variable or station, using the dropdowns.





## Running the studies

For the baseline and alternative studies, open the config.inp file and comment/uncomment the following lines to define a four year simulation period: START\_DATE, QUAL\_START\_DATE, and END\_DATE.

### Setting up and running DSM2

#### baseline study: change starting and ending dates

1. open the config.inp file

2. Comment/uncomment START\_DATE, QUAL\_START\_DATE, END\_DATE to create a four year run, 2010-2014

```
19 MODSTAGE_VERSION PLAN ${DSM2MODIFIER}
20 MODEC_VERSION PLAN ${DSM2MODIFIER}
21 SJR_PROCESS MULTI_STEP #SINGLE_STEP or MULTI_STEP
22
23 START_DATE 01FEB1921 #warm-up before 192110
24 QUAL_START_DATE 02FEB1921 #warm-up before 192110
25 #START_DATE 01OCT2010
26 #QUAL_START_DATE 02OCT2010
27 # START_DATE 01DEC1921 #01OCT1974 # 01DEC2014 #
28 # QUAL_START_DATE 02DEC1921 #02OCT1974 # 02DEC2014 #
29 PTM_START_DATE ${QUAL_START_DATE}
30 END_DATE 01OCT2015 #01OCT1991 #
31 #END_DATE 01OCT2014
32 START_TIME 0000
33 END_TIME 0000
```

Note: The pre-processor needed to be run with a longer time period; that is why we are changing the dates now.

### Setting up and running DSM2

#### alternative study: change starting and ending dates

1. open the config.inp file

2. Comment/uncomment START\_DATE, QUAL\_START\_DATE, END\_DATE to create a four year run, 2010-2014

```
19 MODSTAGE_VERSION PLAN ${DSM2MODIFIER}
20 MODEC_VERSION PLAN ${DSM2MODIFIER}
21 SJR_PROCESS MULTI_STEP #SINGLE_STEP or MULTI_STEP
22
23 START_DATE 01FEB1921 #warm-up before 192110
24 QUAL_START_DATE 02FEB1921 #warm-up before 192110
25 #START_DATE 01OCT2010
26 #QUAL_START_DATE 02OCT2010
27 # START_DATE 01DEC1921 #01OCT1974 # 01DEC2014 #
28 # QUAL_START_DATE 02DEC1921 #02OCT1974 # 02DEC2014 #
29 PTM_START_DATE ${QUAL_START_DATE}
30 END_DATE 01OCT2015 #01OCT1991 #
31 #END_DATE 01OCT2014
32 START_TIME 0000
33 END_TIME 0000
```

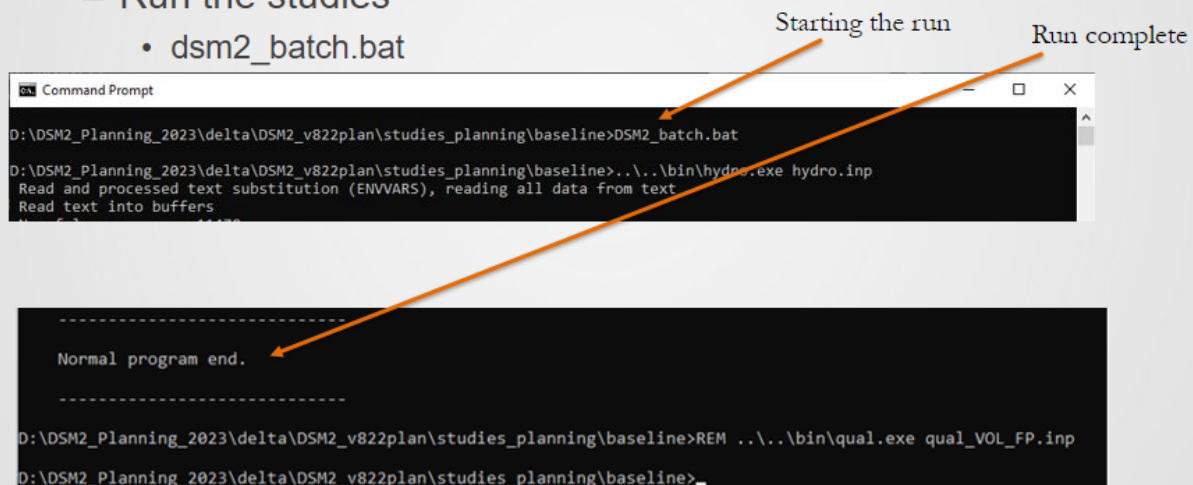
Note: The pre-processor needed to be run with a longer time period; that is why we are changing the dates now.

Run the studies, using a command prompt window.

## Setting up and running DSM2

### baseline study: running DSM2

- For each scenario,
  - Run the studies
    - dsm2\_batch.bat



Starting the run

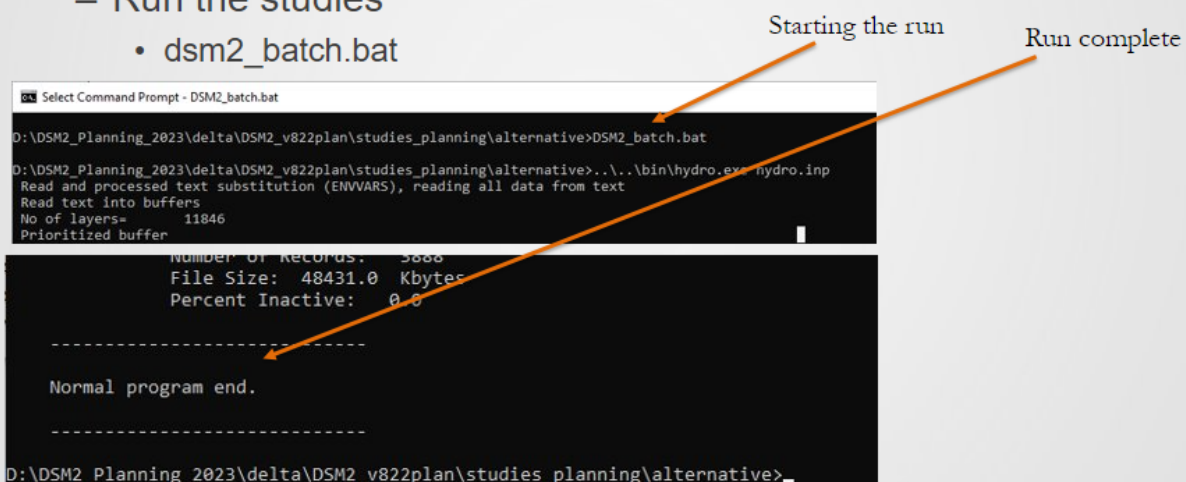
Run complete

```
Command Prompt
D:\DSM2_Planning_2023\delta\DSM2_v822plan\studies_planning\baseline>DSM2_batch.bat
D:\DSM2_Planning_2023\delta\DSM2_v822plan\studies_planning\baseline>..\..\bin\hydro.exe hydro.inp
Read and processed text substitution (ENVVARS), reading all data from text
Read text into buffers
Normal program end.
D:\DSM2_Planning_2023\delta\DSM2_v822plan\studies_planning\baseline>REM ....\bin\qual.exe qual_VOL_FP.inp
D:\DSM2_Planning_2023\delta\DSM2_v822plan\studies_planning\baseline>_
```

## Setting up and running DSM2

### alternative study: running DSM2

- For each scenario,
  - Run the studies
    - dsm2\_batch.bat



Starting the run

Run complete

```
Select Command Prompt - DSM2_batch.bat
D:\DSM2_Planning_2023\delta\DSM2_v822plan\studies_planning\alternative>DSM2_batch.bat
D:\DSM2_Planning_2023\delta\DSM2_v822plan\studies_planning\alternative>..\..\bin\hydro.exe hydro.inp
Read and processed text substitution (ENVVARS), reading all data from text
Read text into buffers
No of layers= 11846
Prioritized buffer
Number of Records: 5888
File Size: 48431.0 Kbytes
Percent Inactive: 0.0
Normal program end.
D:\DSM2_Planning_2023\delta\DSM2_v822plan\studies_planning\alternative>_
```



## DSM2 outputs are available for download

If you would prefer to download the DSM2 outputs rather than running that models, you can do so here:

<https://data.cnra.ca.gov/dataset/dsm2-example-planning-study-output>