On Farm Water Budget

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September 21-22, 2009

Convergence Problems

- Programming in batch file working fine
- Recently Willem suggested modification to pcg
  - Set inner iterations to 1 outer iterations to as many as necessary
  - Have not tried this
- New version of PEST
  - *Better handling of model run failure as parameters are upgraded.* If a model rejects a new set of upgraded parameters and fails to run to completion, PEST can be instructed provide it with another set of upgraded parameters instead of terminating execution with an error message

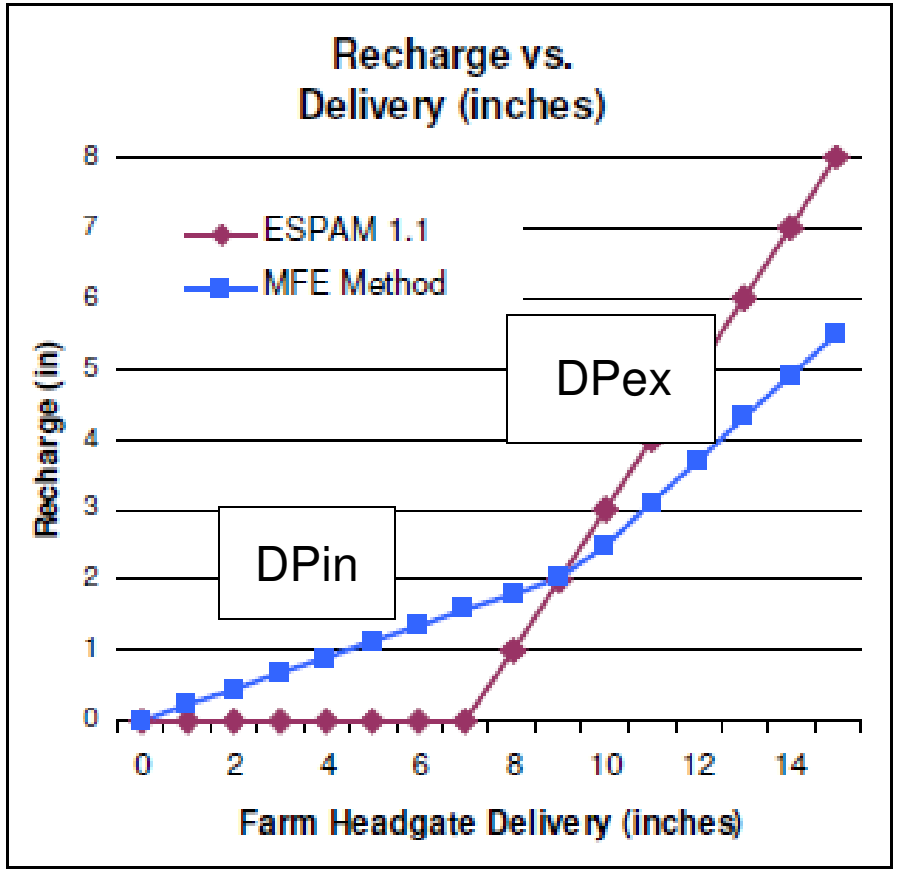
On Farm Water Budget

- Evaluate Sullivan/Schroder On Farm module
  - ESHMC recommendations
    - Three runs
      - Use “Maximum Farm Efficiency using Runoff for Returns” (FER)
      - Hold DPex and DPin and adjust EffSP and EffGR
      - Adjust DPex, DPin, and hold EffSP and EffGR fixed
      - Adjust DPex, DPin, EffSP and EffGR

On Farm Water Budget

- 4 parameters per entity
  - Flood efficiency (EffGR)
  - Sprinkler efficiency (EffSP)
  - Deep percolation of excess water (DPex)
  - Deep percolation of infiltrating water (DPin)
- 41 SW irrigation entities
- 164 adjustable parameters

Deep Percolation Parameters

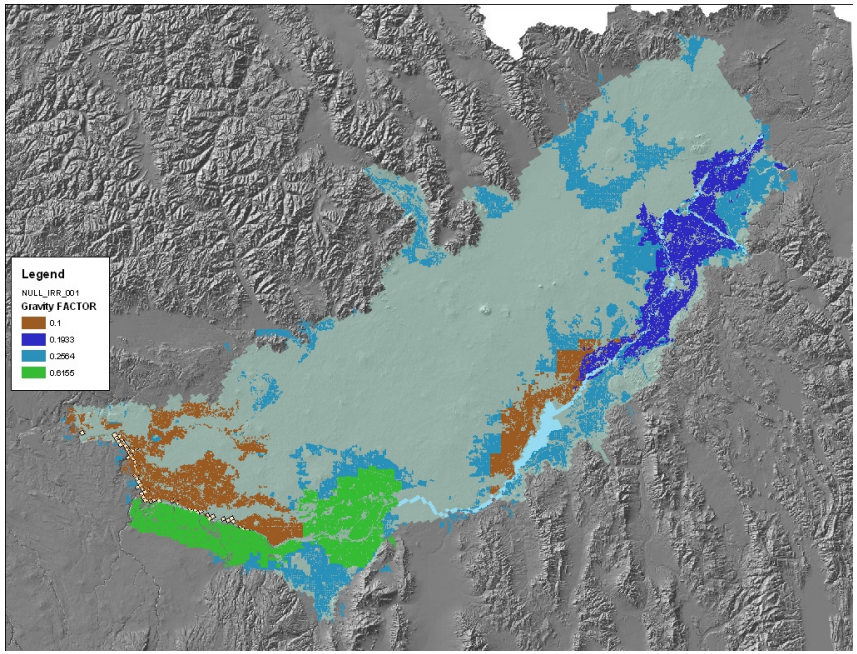


- For both flood and sprinkler irrigation
  - Deep percolation of excess water (DPex)
  - Deep percolation of infiltrating water (DPin)

Run holding DPex and DPin fixed

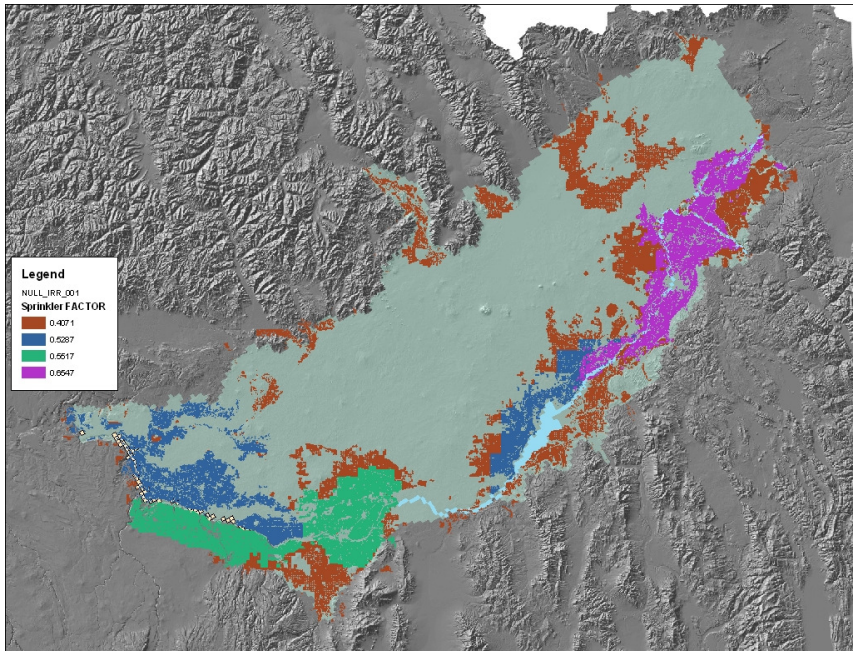
- Use “Maximum Farm Efficiency using Runoff for Returns” (FER)
- DPex = 0.5
- DPin = 0.9
- EffSP adjustable 1.0 – 0.4
- EffGR adjustable 0.7 – 0.1
- Group surface water entities
  - Those with long canals
    - Aberdeen Springfield, AFRD#2 and Northside
  - Those diverting above American Falls
  - Those diverting below American Falls
  - Those not diverting from the Snake River

On Farm Water Budget



- DPin = 0.9
- DPex = 0.5
- EffSP and EffGR adjustable
- Readinp
  - Standard error = 7.765
- OnFarm
  - Standard error = 7.687

On Farm Water Budget



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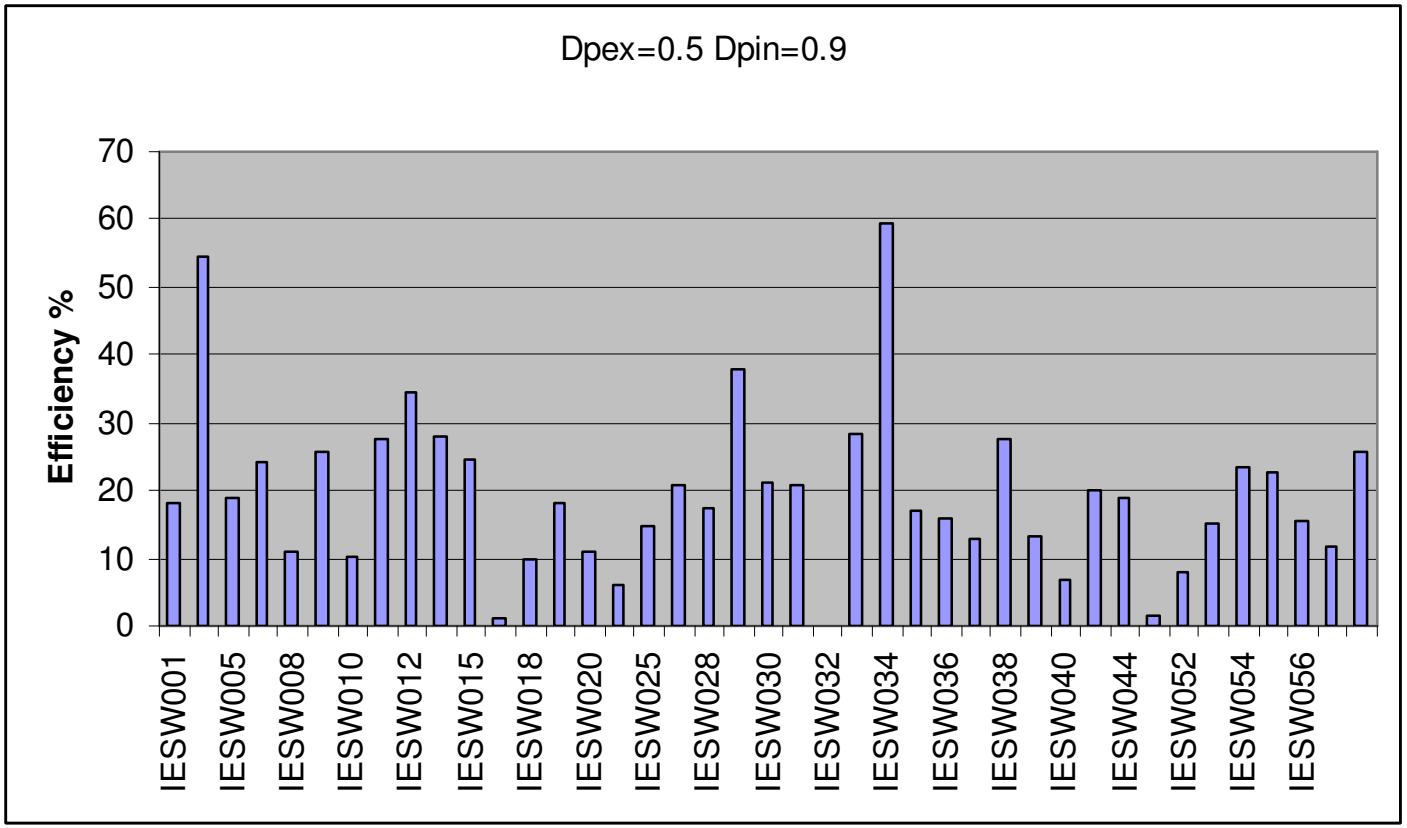
Surface water irrigation/system efficiency



- IESW001 A & B SW,
- IESW002 Abdn Sprfld,
- IESW005 Big Lost River,
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- IESW008 Blaine,
- IESW009 Burgess,
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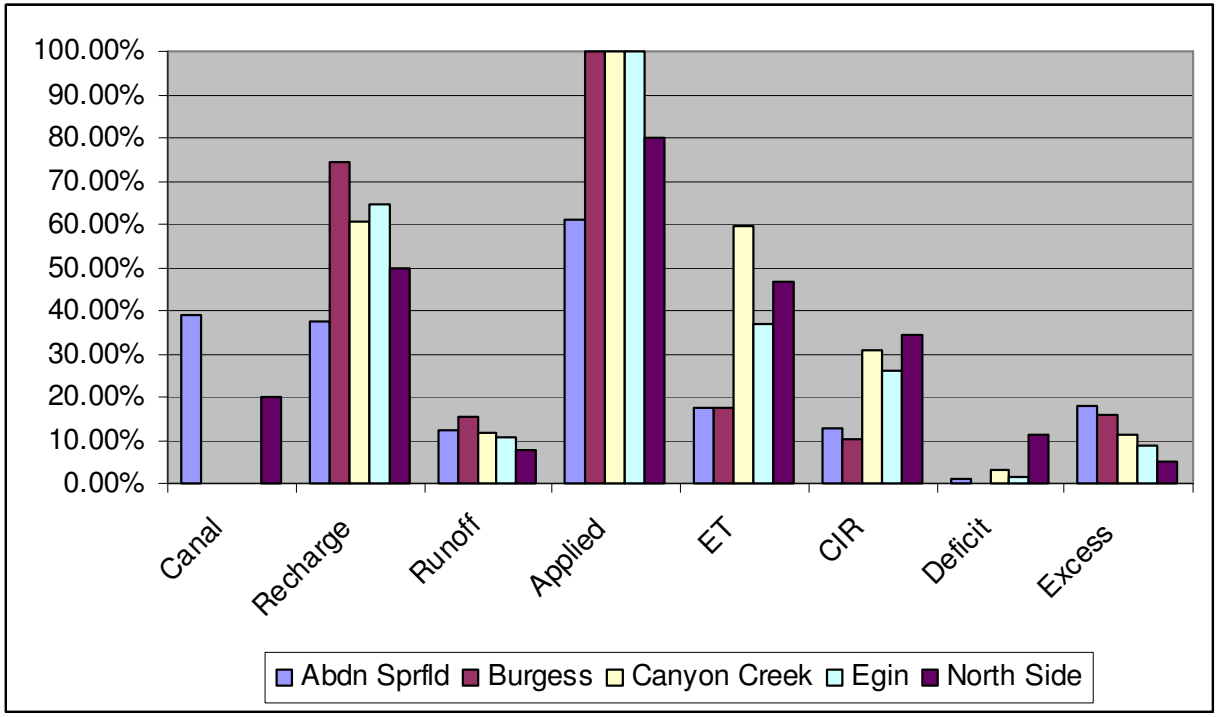
- IESW055 Dry Bed,
- IESW056 Henrys Fork,
- IESW057 Blackfoot River

Surface Water Fate DPin and DPex fixed



Canal	Canal Seepage
Recharge	Deep percolation to groundwater
Runoff	Surface runoff
Applied	Applied surface water irrigation
ET	Evapotranspiration
CIR	Crop Irrigation Requirement
Deficit	Unmet CIR
Excess	Irrigation more than CIR

Run holding EffSP and EffGR fixed

- Use “Maximum Farm Efficiency using Runoff for Returns”
- DPex adjustable 1.0 – 0.00001
- DPin adjustable 1.0 – 0.00001
- EffSP = 0.64 except for long canals = 0.85
- EffGR = 0.48 except for long canals = 0.60
- Group surface water entities
  - Those with long canals
    - Aberdeen Springfield, AFRD#2 and Northside
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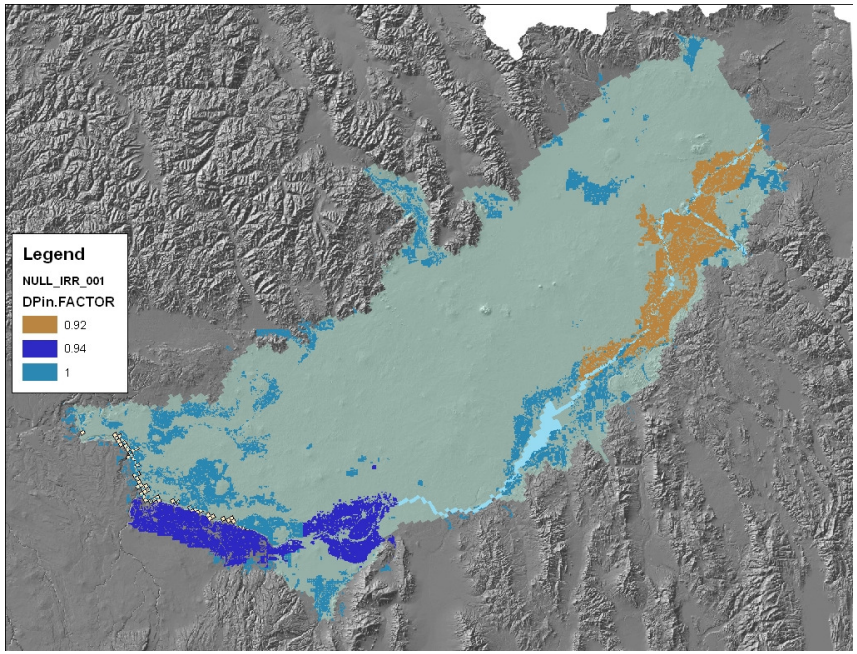
On Farm Water Budget



- DPin and DPex adjustable
- EffGR = 0.48
  - Long canals = 0.60
- EffSP =0.64
  - Long canals = 0.85
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- OnFarm
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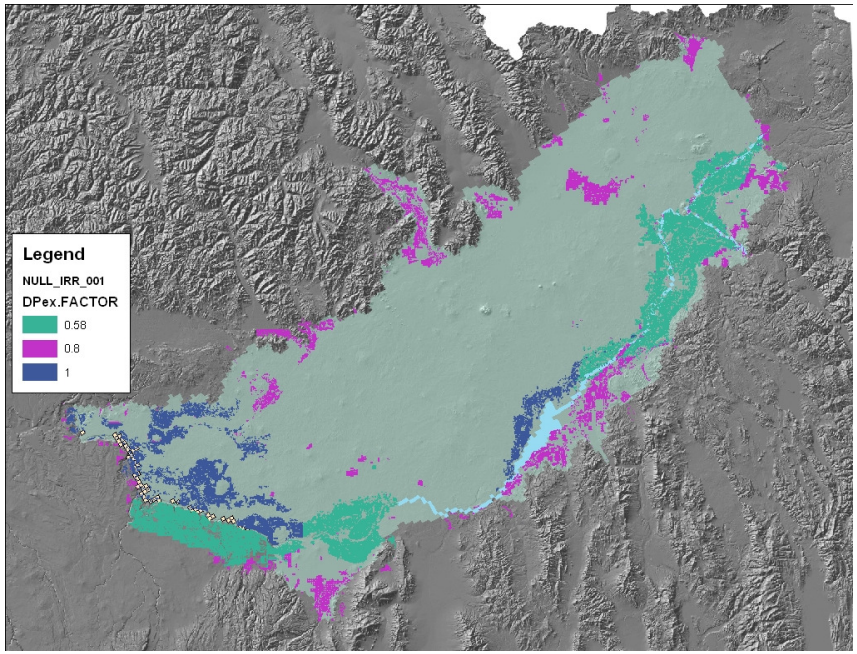
On Farm Water Budget



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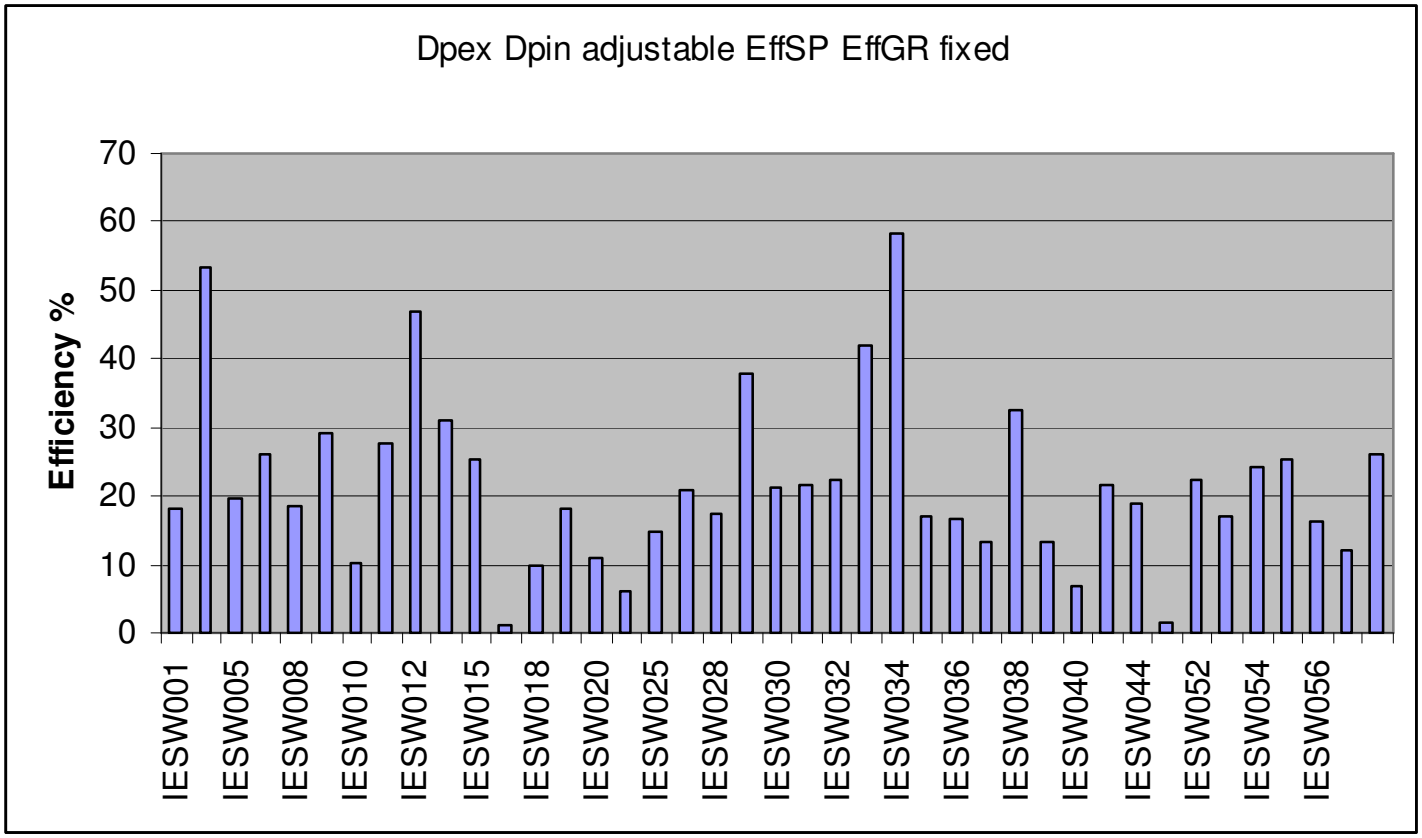

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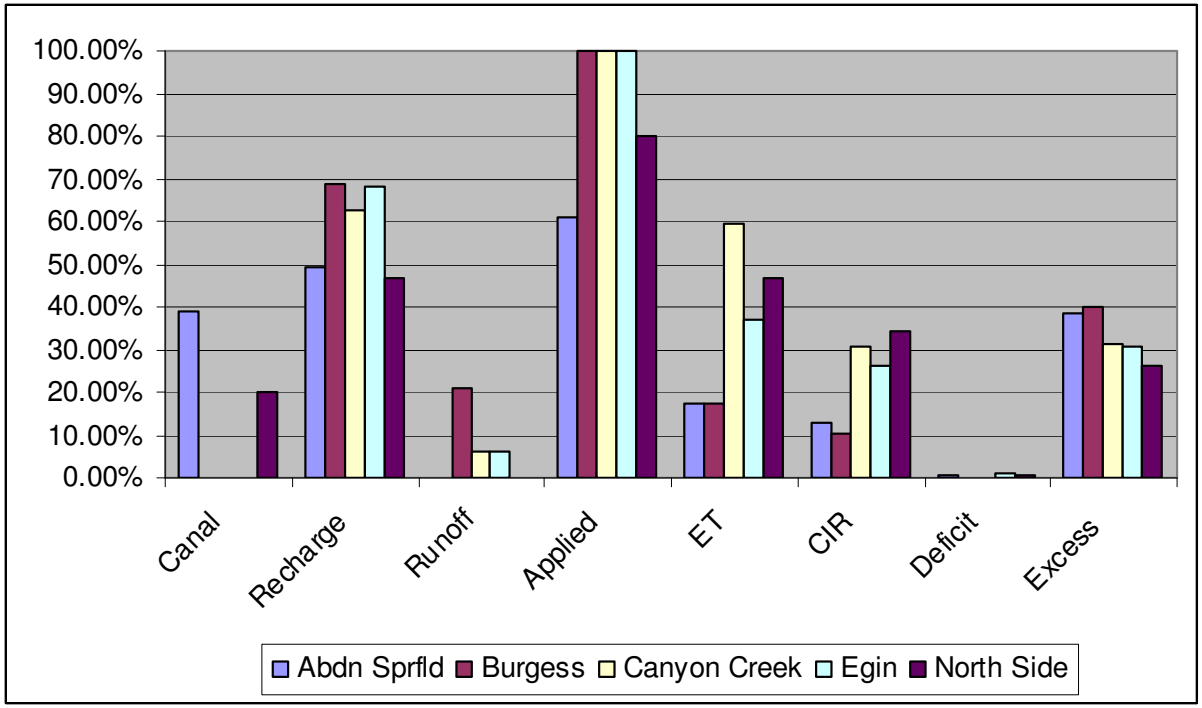
Surface Water Fate EffSP and EffGR fixed



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Run EffSP, EffGR, DPin, and DPex adjustable

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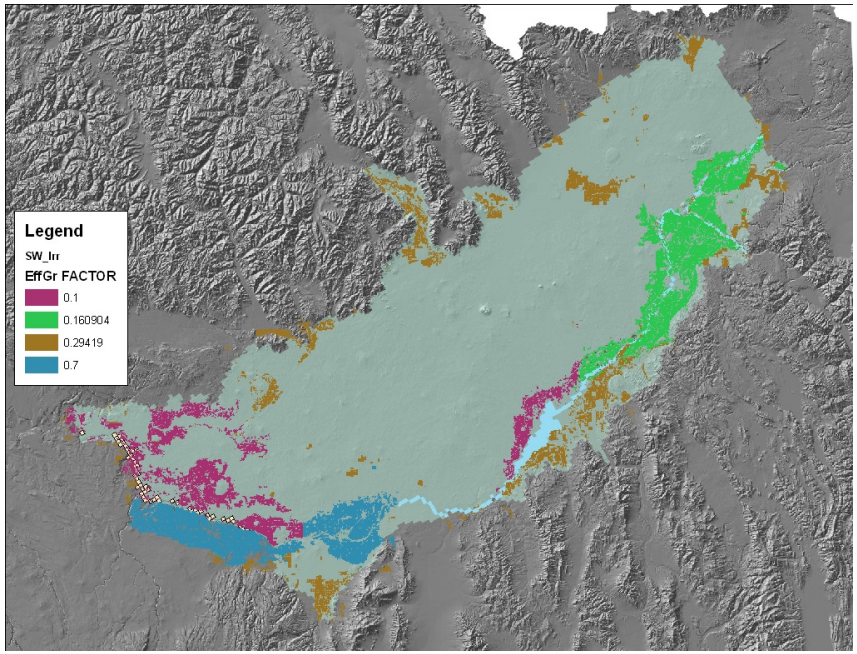

- EffGR and EffSP adjustable
- DPin and DPex adjustable
- Readinp
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- OnFarm
  - Standard error = 7.384

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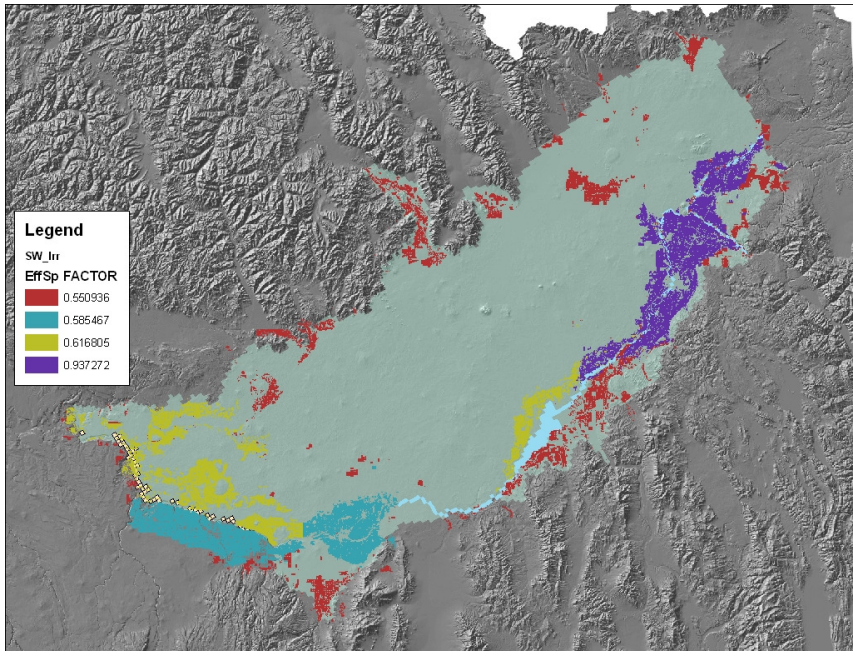

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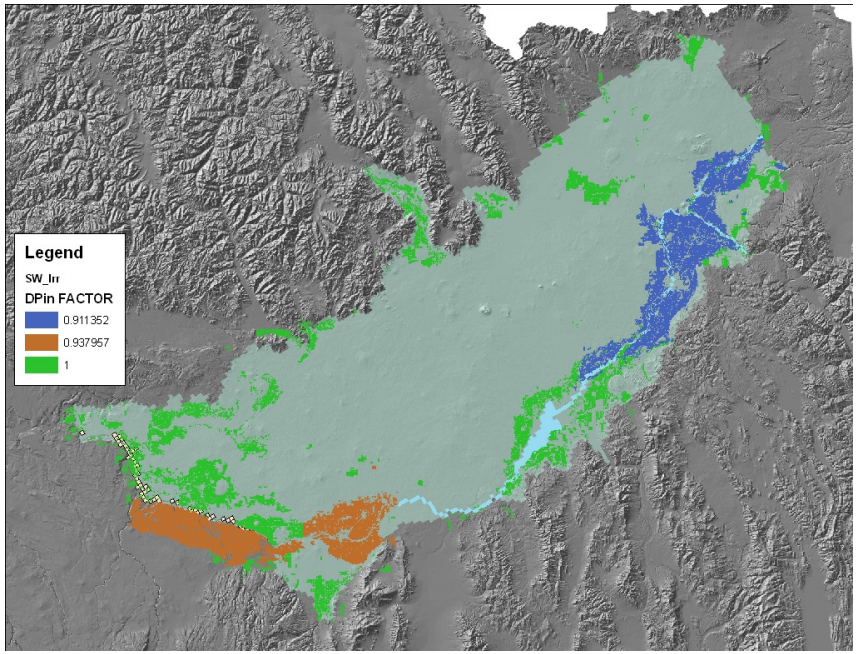

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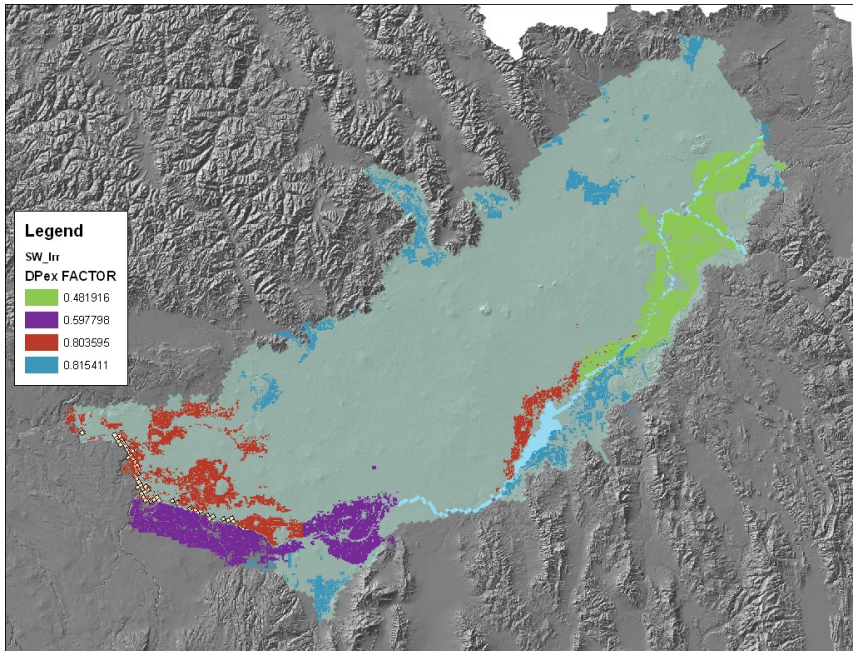

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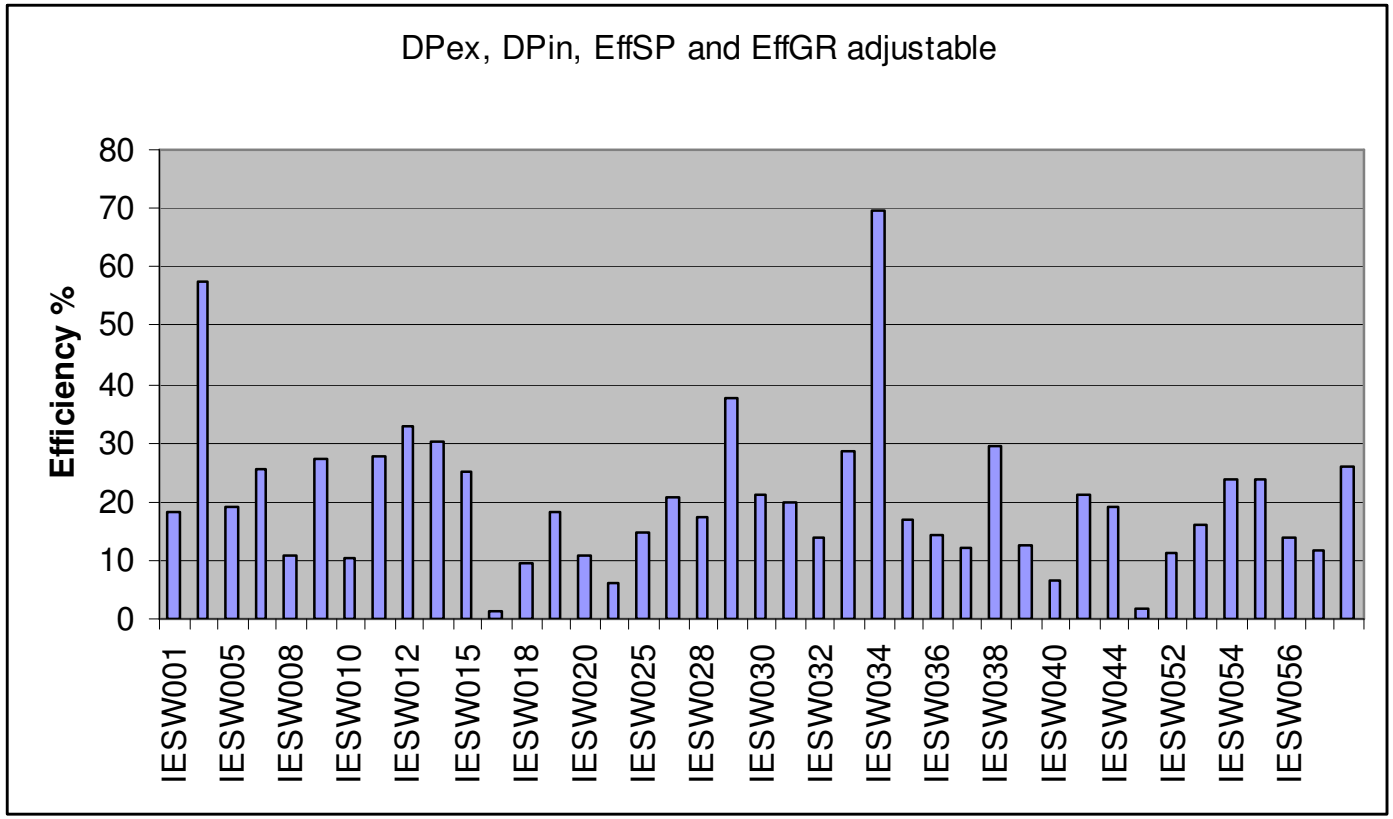

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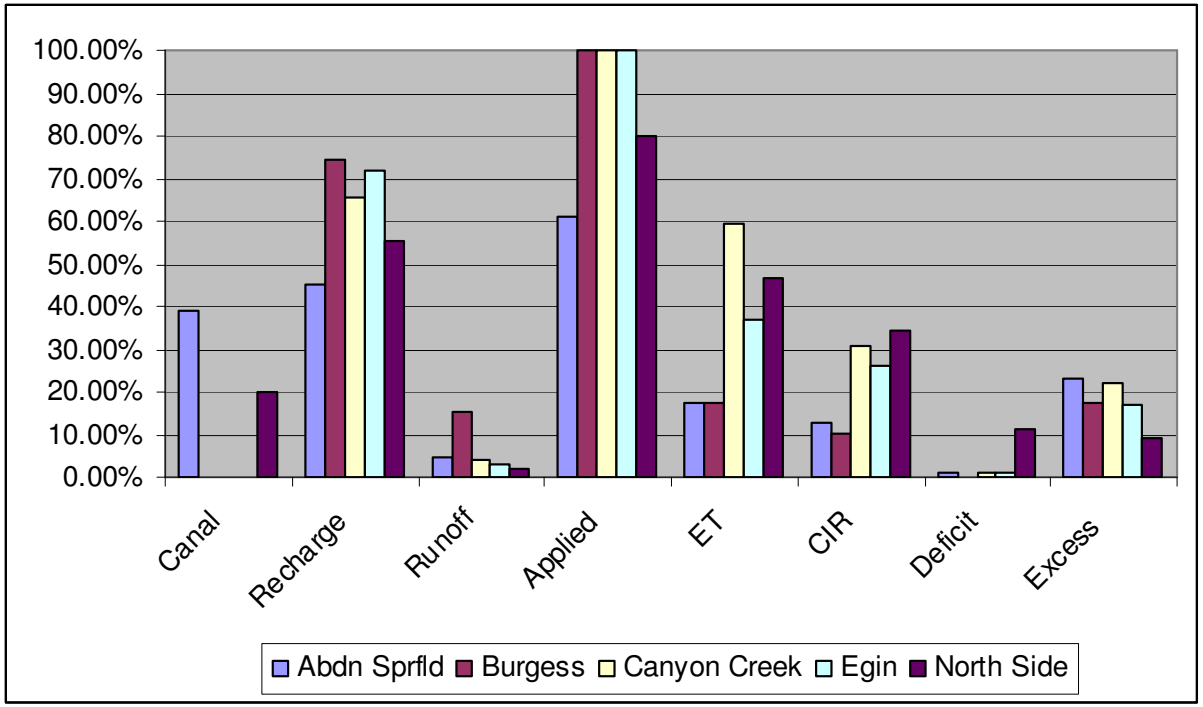

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END

31 lines of batch file prior to transient run.

```
rem run transient model
del e_flag.txt                  < delete file e_flag.txt
mf2k17 <bigtran1                < run MODFLOW with lmg solver
ChkLst <ChkLst.in               < CHKLST reads a MODFLOW list file looking to see if MODFLOW converged
if exist e_flag.txt goto end    < if MODFLOW converged this file will be created and batch file will skip to END
mf2k17 <bigtran2                < run MODFLOW with pcg solver
ChkLst <ChkLst.in               < CHKLST reads a MODFLOW list file looking to see if MODFLOW converged
if exist e_flag.txt goto end    < if MODFLOW converged this file will be created and batch file will skip to END
mf2k17 <bigtran3                < run MODFLOW with pcg solver with relaxed convergence criterion
:END
```

24 lines of batch file follow this.