Improvement of Applying DETAW to DSM2 Historical Simulation

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Milestones of DETAW

- 2004, DETAW v.1.0 by UCDavis and BDO
- 2009, Python version of DETAW
- 2010, Calibration of DETAW by SEBAL 2007 data
- 2012, Validation of DETAW by SEBAL 2009 data
- 2013, Post-process of DETAW and applying to DSM2

Post-process of DETAW

1. What is the post-process of DETAW ?

Converting the consumptive use terms of 168 islands in the Delta to DSM2-node irrigations, drainages and seepages.

2. DETAW consumptive use terms for calculating node CUs:

Crop ET, ET of applied water (ETaw) for crops, ETaw of waterbody, effective seepage, and total precipitation.

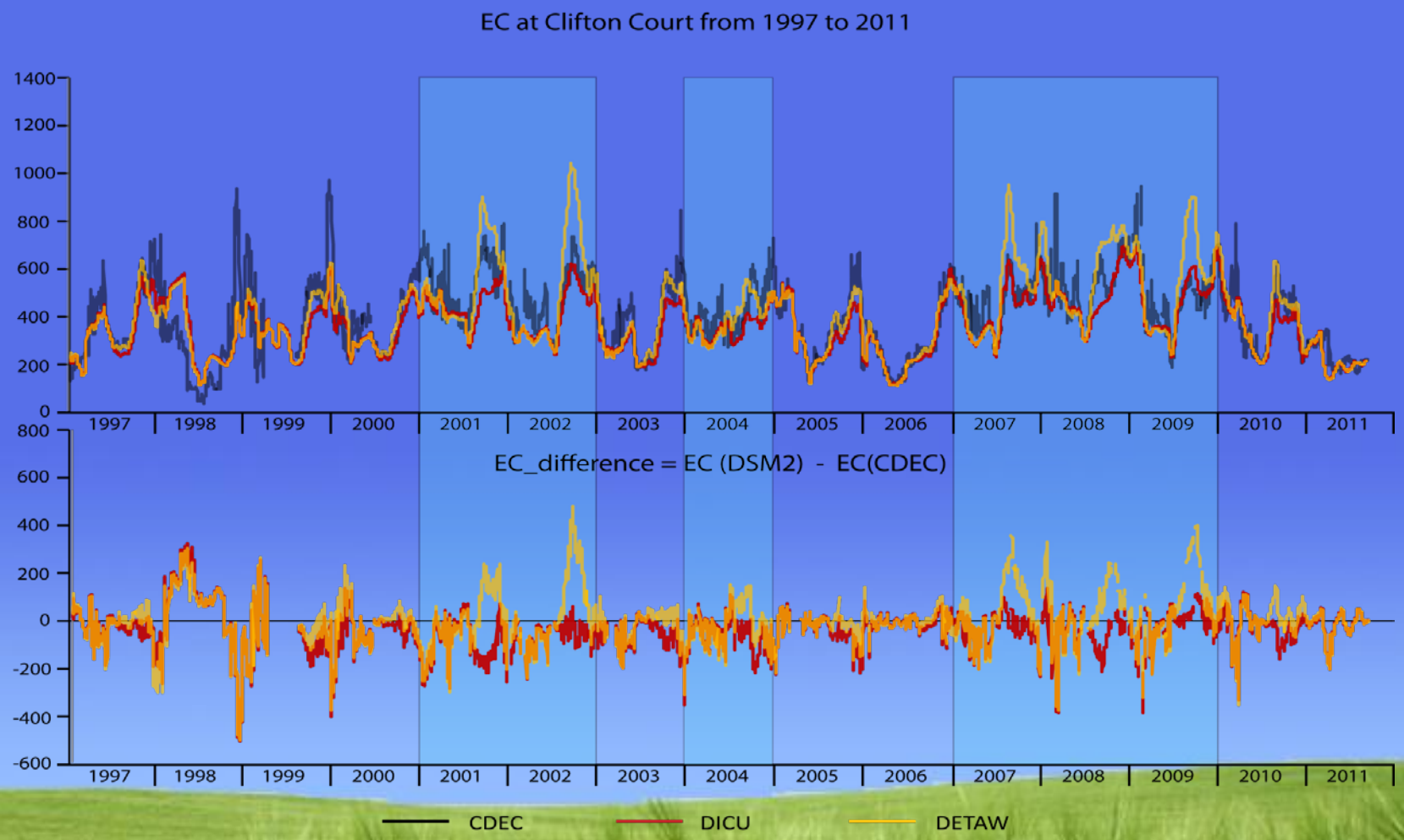
3. What do the current DSM2 node CUs come from?

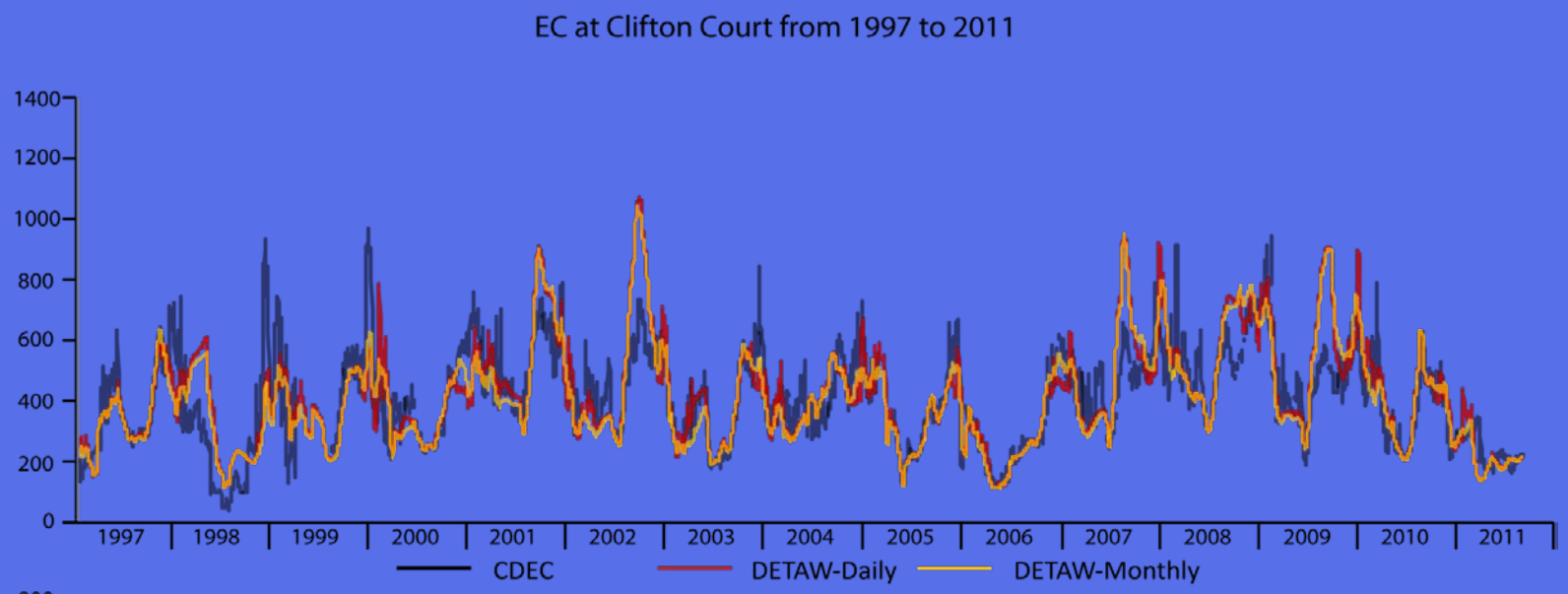
Post-process of DICU

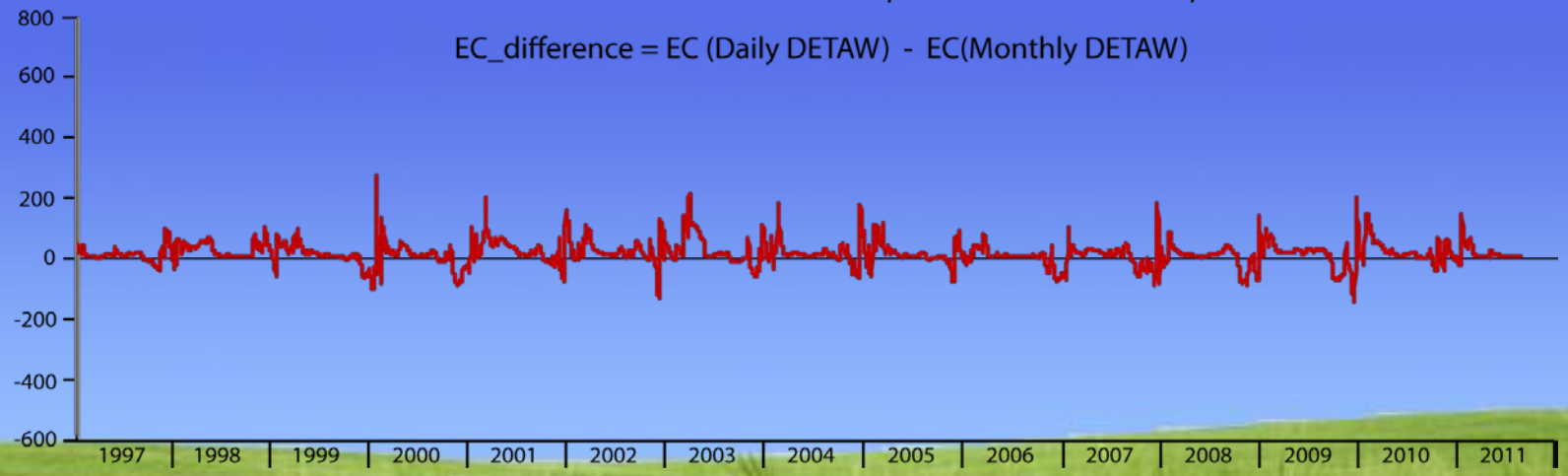
Comparison of the post-processes of DETAW and DICU

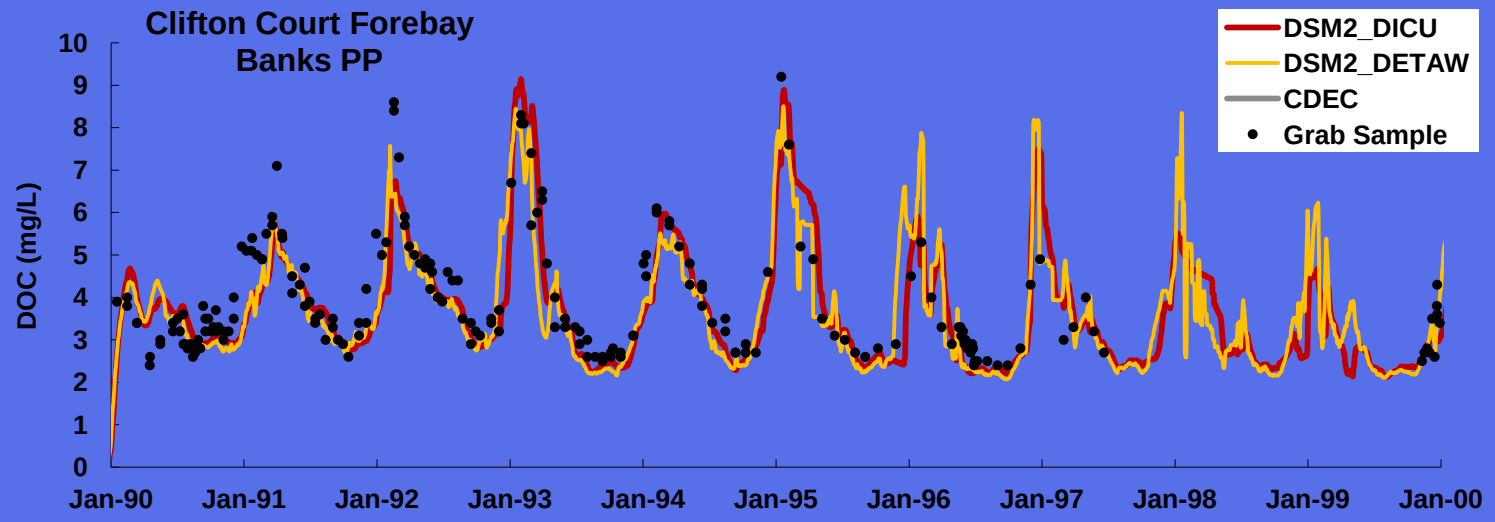
	DETAW	DICU
Common points	Irrigation efficiency	
	Allocation factors from islands to nodes	
Differences	162 islands	142 islands
	Drainage=CUaw/Irr.+La+ CU_water	Drainage = CUaw/Irr. + La
	Monthly and daily time steps	Monthly time step

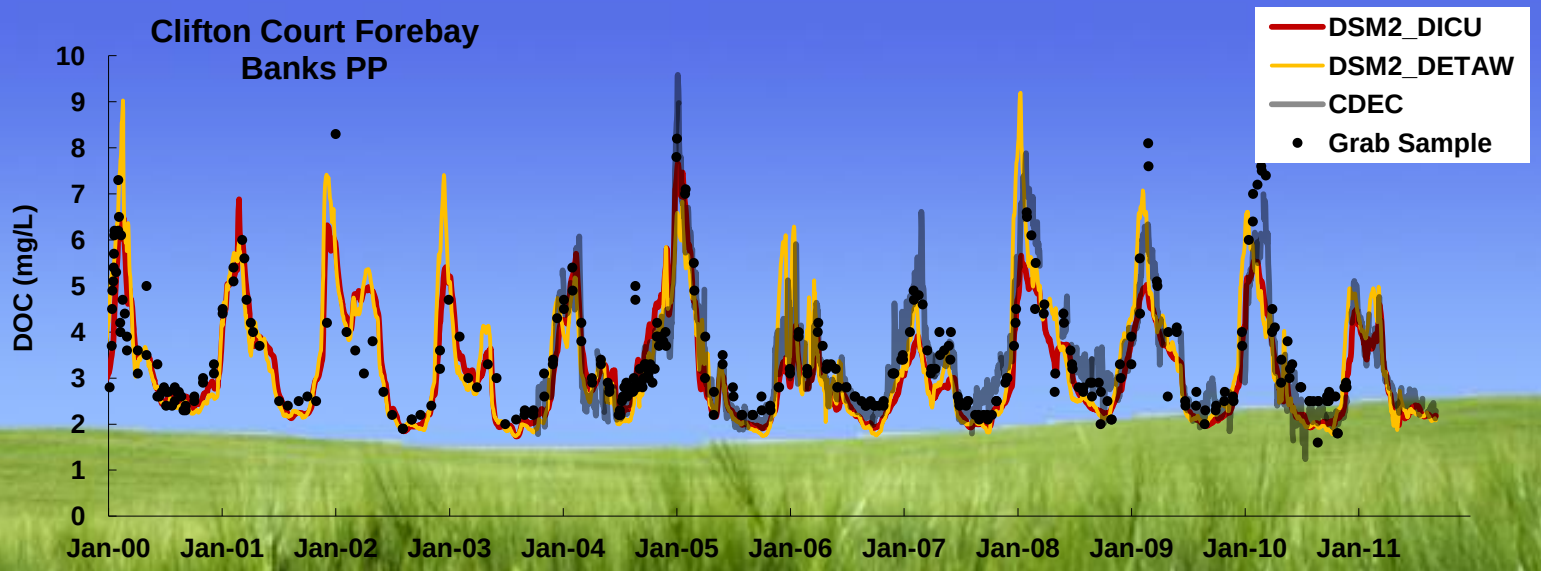
Examples of DETAW impacts to DSM2 EC and DOC simulations

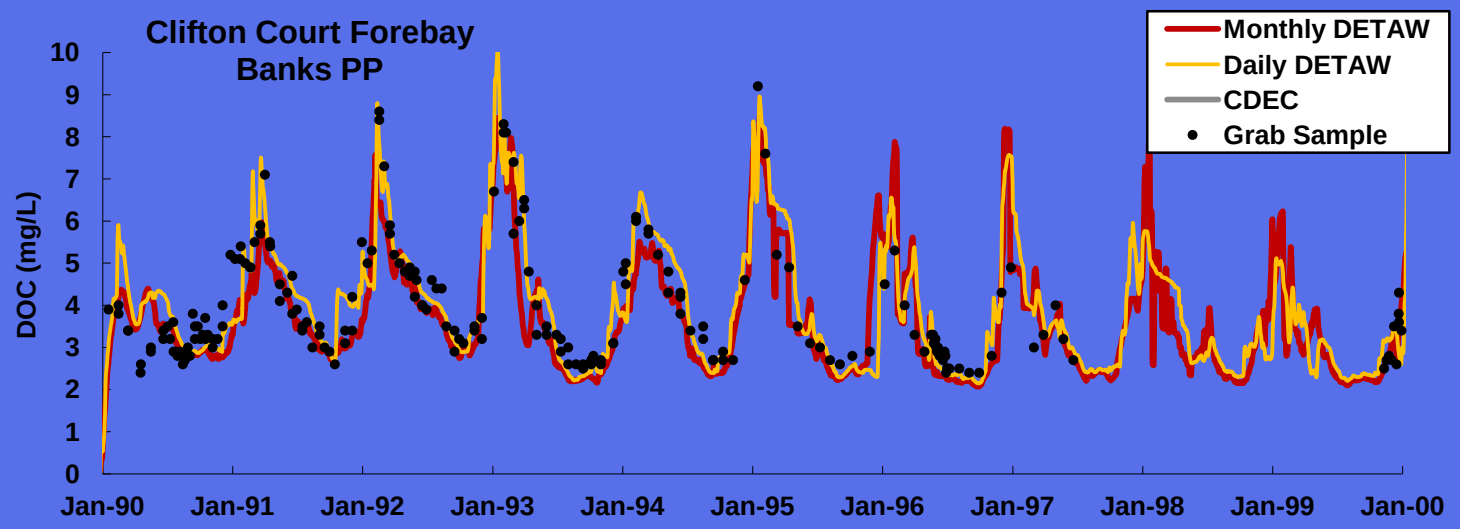


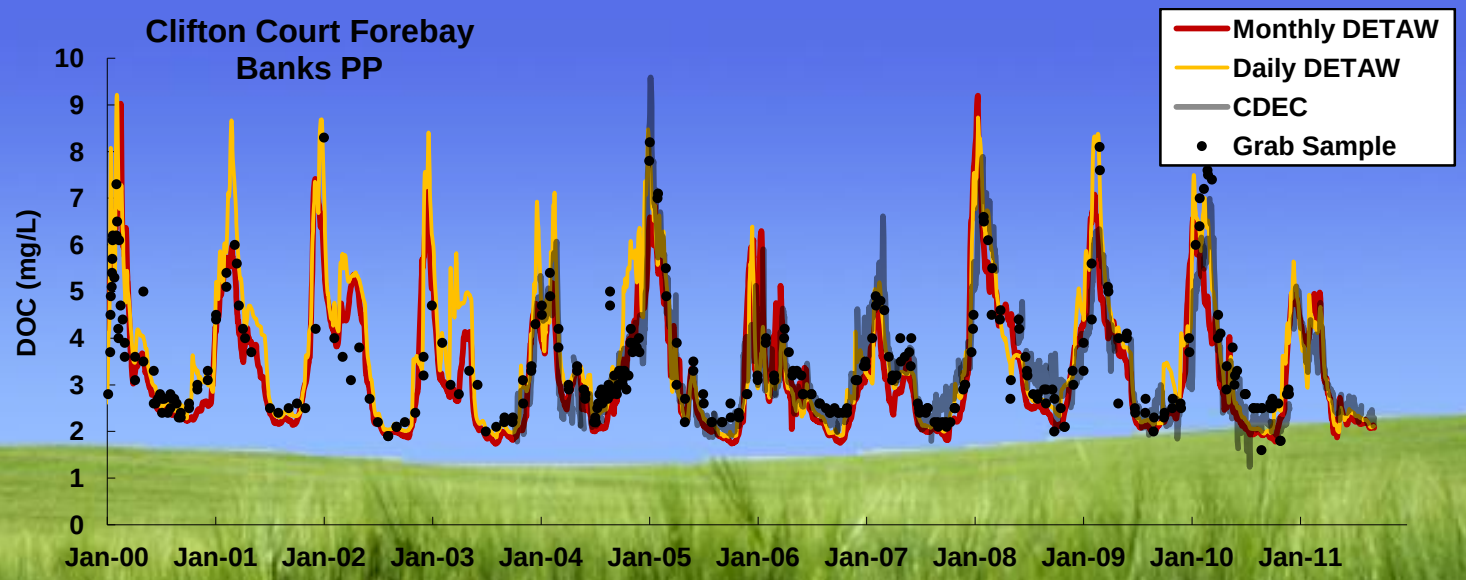

EC at Clifton Court from 1997 to 2011
1400
1200
1000
800
600
400
200
0
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
CDEC
DETAW-Daily
DETAW-Monthly


EC_difference = EC (Daily DETAW) - EC(Monthly DETAW)
800
600
400
200
0
-200
-400
-600
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011


Clifton Court Forebay
Banks PP
DOC (mg/L)
0
1
2
3
4
5
6
7
8
9
10
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
DSM2_DICU
DSM2_DETAW
CDEC
Grab Sample


Clifton Court Forebay
Banks PP
DOC (mg/L)
0
1
2
3
4
5
6
7
8
9
10
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
DSM2_DICU
DSM2_DETAW
CDEC
Grab Sample


Clifton Court Forebay
Banks PP
DOC (mg/L)
0
1
2
3
4
5
6
7
8
9
10
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Monthly DETAW
Daily DETAW
CDEC
Grab Sample


Clifton Court Forebay
Banks PP
DOC (mg/L)
0
1
2
3
4
5
6
7
8
9
10
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Monthly DETAW
Daily DETAW
CDEC
Grab Sample

Future Work

1. DETAW will have significant impacts to DSM2 water quality simulations. Recalibration of DSM2 is required if DETAW is adopted.

2. Daily DETAW gets more detail information in simulating water quality, especially for DOC. It apparently helps to get better DOC peak times and values. Regional allocation factor adjustment might get even better results.