Acctg procedures

Calculate

$h(x,y)$ = computed heads
$q_s(h)$ = computed baseflow
P = pumping

Calculate state impacts $\frac{\Delta Q}{\Delta P} \approx \left(\frac{dq}{dP}\right) \Delta P$

If stream is dry w/all-on condition:
start with all-off condition. if stream flow = 0 with all-off, depletion = zero + we're done. Otherwise use bisection to determine fraction of pumping that uses all stream flow, and remainder comes from storage. for ~~at~~ fraction of pumping fp that uses all stream flow, calculate each state's contribution

If $q_s > 0$ with all on, then ~~known, by assumption~~ assume known & calculable $\Delta Q = Q|_{P_{ON}} - Q|_{P_{ON}}$
ΔQ_c $Q|_{P_{ON}} - Q|_{P_{ON}}$
⋮
ΔQ should be $\approx \Sigma \Delta Q_i$

else
find fraction of all pumping at which stream goes dry
then calculate total & component depletions as before
but based on conditions P_{all} and fP_{ON} ~~where~~:

$$\Delta Q = Q|_{P_{all\,OFF}} - Q|_{fP_{ON}}$$

$$\Delta Q_c = Q|_{P_{all\,OFF}} - Q|_{all\,fP_{ON}}$$

0 ~~2~~ .4 . 6 . 8 1

test procedure for 2003

1. ~~Calculation Model determine~~

Run model for all f_k for f_k 0, .2, .4, .6, .8, 1

for each impact case calc f_{ki} for each reach + time step

for each [account]: find f_k at which stream flow is completely depleted. then for each (impact run) calculate component depletions

2003:

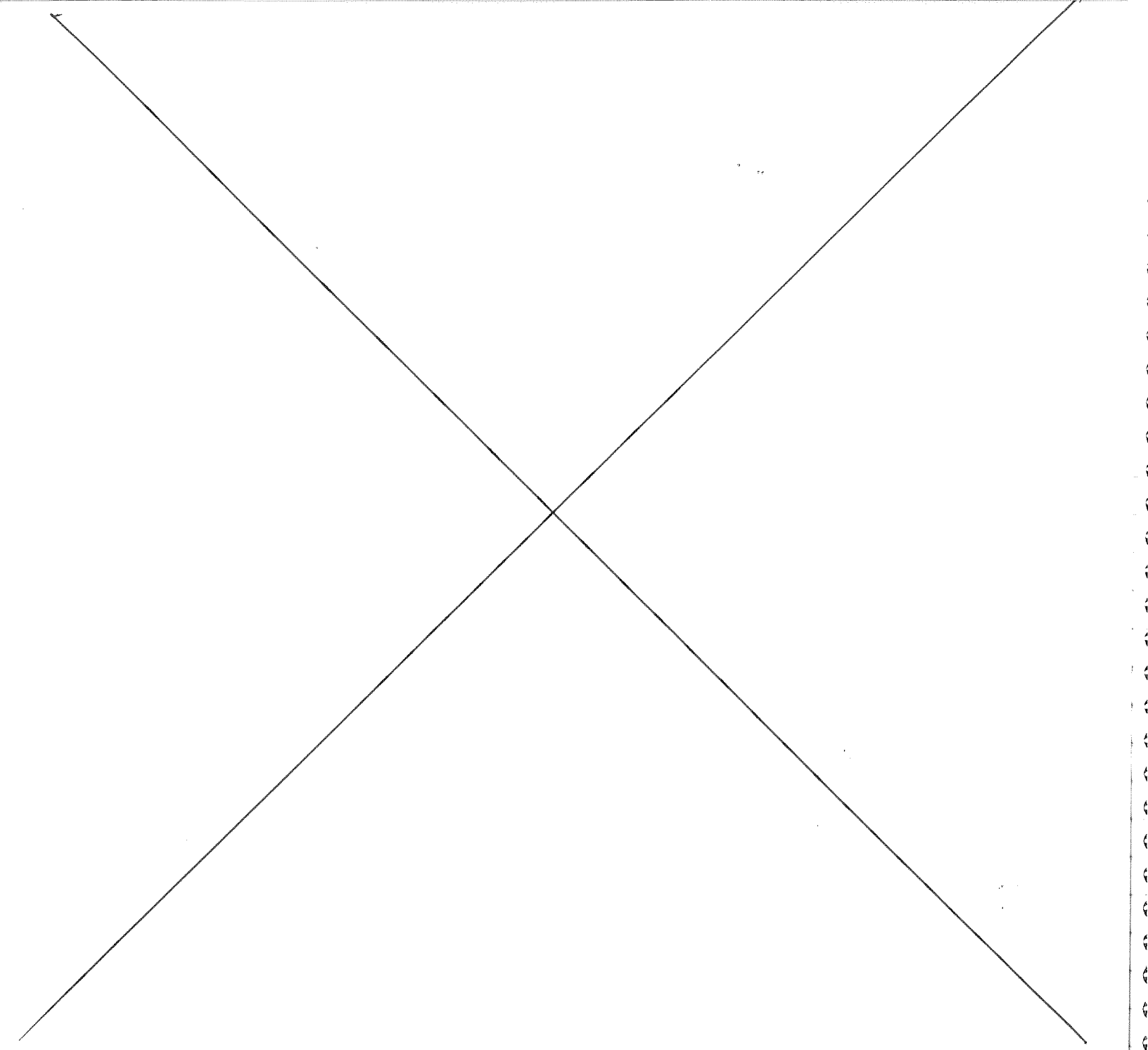
total Impact

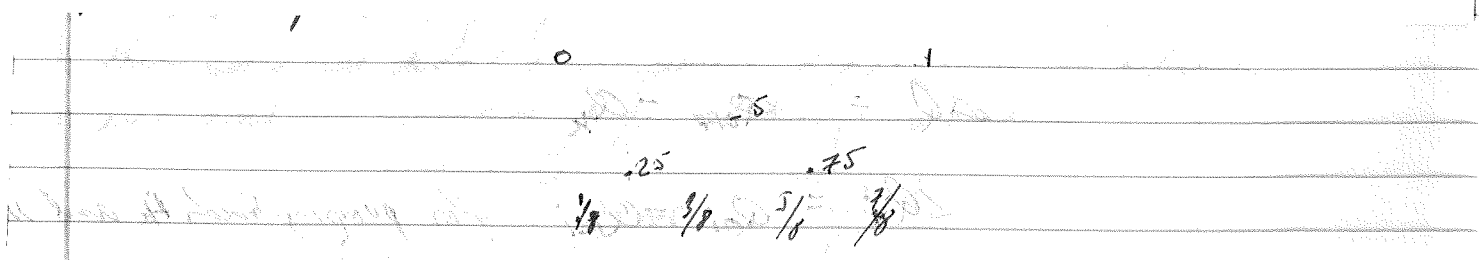
	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1
All	0	.1	.25		.5		.75		.9	1	
f_k All B	0		.2		.4		.6		.8	1	$k = 0, 1, \ldots, 5$
each stake f_{ki} $i = 1, 2, 3, 4$			.2		.4		.6		.8		

f_{ki} = 0 corresponds to NO PUMP [ΣQ_i] or MOUND condition.

$$\Delta Q = Q_{off} - Q_k$$

$\Delta Q_i = Q_{oi} - Q_{ki}$ for pumping stake i and impact case k.



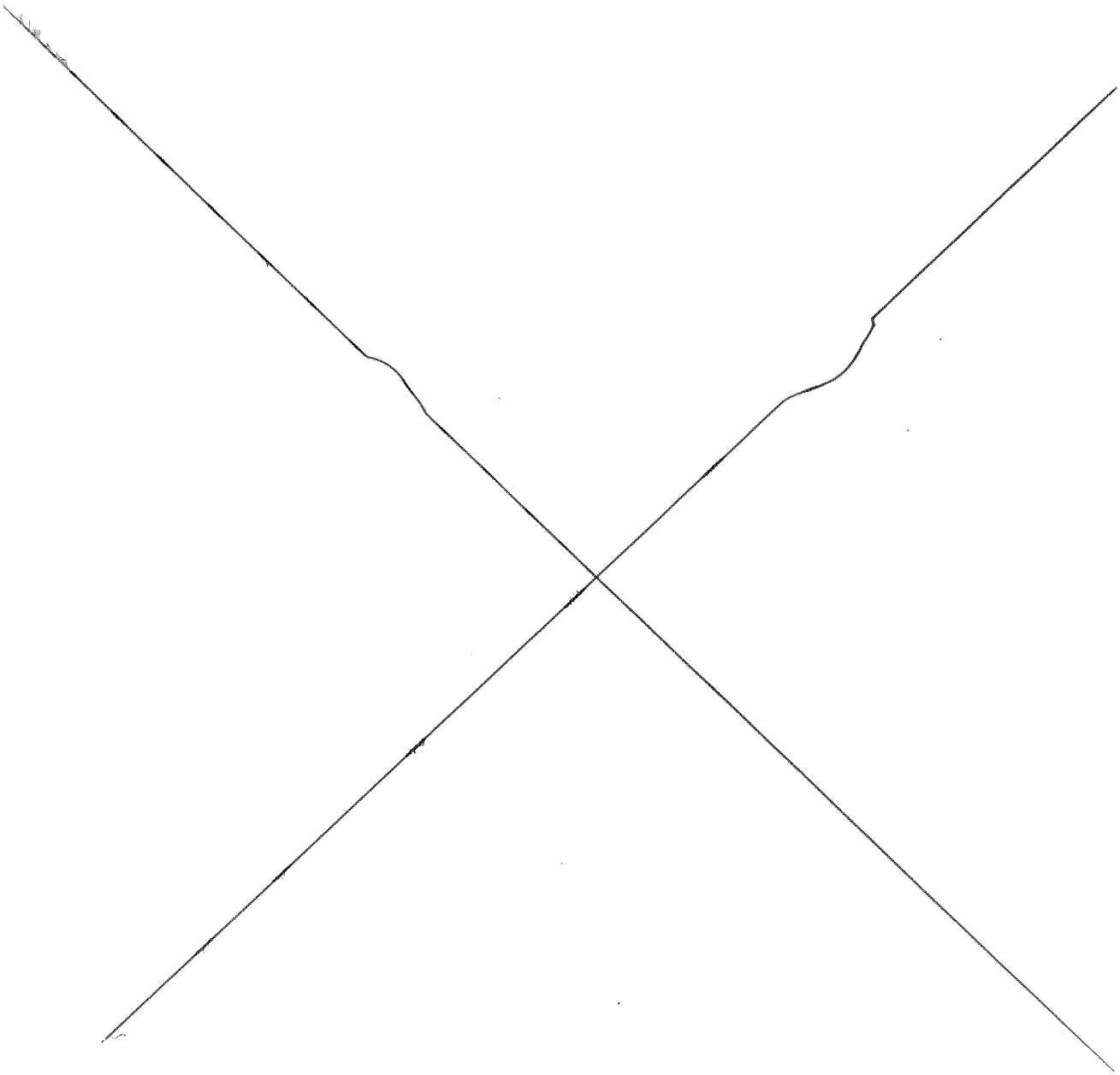

0
1
.5
.25
.75
1/8
3/8
5/8
7/8

from VWS case: ΔQ_{ik} for $k=1$

from base case: back off each stress by Δf

for each fraction of total pumping:

Compare to base case (with total pumping P):



base 12p_test.nam 12p_test.rch, ~.wel, ~.out, ~.sfr
all off 12p.0_all.nam

2:20 pm 4/3/2012	pumping_impacts_July_1918-2010.xls -created in c:\gw\vrca\bgn2001\impacts_base (laptop copied to L:\spp\vrca\2012_alt_accts\revised and S:\gw\vrcaadmin\bgn2001\impacts_base

$$I \approx T_h + \frac{1}{3}\left(T_h - T_{2h}\right) \quad \text{for } q=2,\ p=2$$

$$= \frac{1}{3}(4T_h - T_{2h})$$

eqn 7.2.12

Dahlquist + Bjorck p. 271

Conte + de Boor p. 339

Press et al. p. 113 eq. 4.2.4

for $q=2,\ p=1$ $\quad A_{m,k} = A_{m,k-1} + \left(A_{m,k-1} - A_{m-1,k-1}\right)$

error is $o(h)$

for $q=2.5,\ p=1$ $\quad A = A$

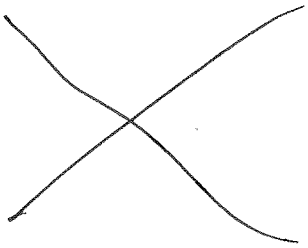
$$F(0) = F(h) + \frac{F(h) - f(qh)}{q^p - 1}$$

$$= f(0.2) + \frac{f(0.2) - f(0.5)}{2.5 - 1} = \frac{f_{0.2} - f_{0.5}}{1.5}$$

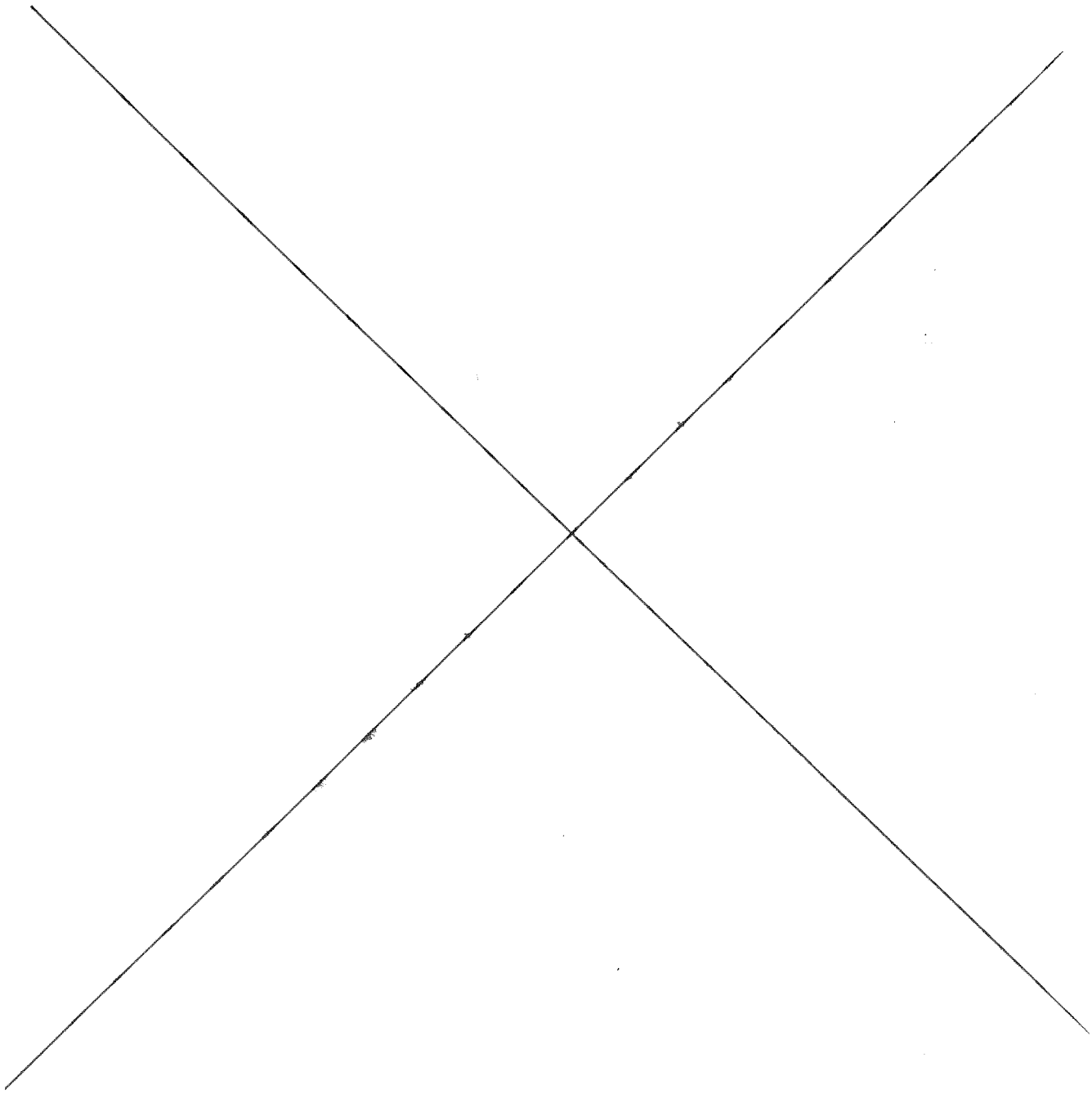
$$= f(0.2)\left(1 + \frac{1}{1.5}\right) - \frac{f(0.5)}{1.5}$$

$$f(0.2)\left(\frac{2.5}{1.5}\right) - \frac{f(0.5)}{1.5}$$

$$= \frac{1}{1.5}\left(2.5 f(0.2) - f(0.5)\right)$$



if $|e(h)| < 0.5$
then $A(0) \approx A(h)$
if (~~Abs(A~~ | A
else if $|e(h)| > |e(qh)|$
then $A(0) \approx A(qh)$
else $A(0) = A(h) + (A(h) - A(qh)) / (q^p - 1)$



Fig

1 total incr

2 total cumul

3 main Swanson - Harlan City incr

4 " cumul

5

6

7

8

9

10

05 025

98

195 all

292 CO

389 KS

486 NE

583 MD

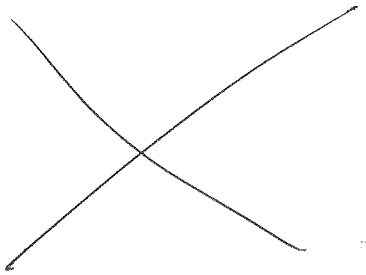
781 NE-MD

680 mean

684 std dev

	RRCA	other
CO	-10480	-12680
KS	100380	92,950
NE	-31,350	-21,730

Thursday
May 10, 2012



run_pt0_to_1_pt2_incr_bat

```
                    args:  1    2    3    4
call incr_stress_v2        0   0.2  0.2
```

```
sub incr_stress_v2 %1 %2 %3 %4
  call sub_ptxx %2 %1 %1 %1 %3_pt%4co
                0.2  0   0   0   0_pt2co
```

		CO	KS	NE	MD		CO	KS	NE	MD	CO	KS	NE	MD
	all on	1	1	1	1	base	1	1	1	1	0	0	0	0
	all off	0	0	0	0	z|base	0.9	0.9	0.9	~~0.9~~ 0.9	0.1	0.1	0.1	0.1
CKN	PMP ON	1	1	1	0	d|base	1	1	1	~~0.9~~ 0.9	0.1	0	0	0
KN	COMD OFF	0	1	1	0	ad|d	0.9	1	1	~~0.9~~ 0				
CN	KSMD OFF	1	0	1	0	bd|d	1	0.9	1	0				
CK	NEMD OFF	1	1	0	0	cd|d	1	1	0.9	0				

Impact sum: $(ad-d)+(bd-d)+(cd-d)+(d-base)$

z-base: $(ad-d)+(bd-d)+(cd-base)$

Inter

[2J

	CO	KS	NE	MD
base	1	1	1	0
all off	0.9	0.9	0.9	~~0.9~~ 0
MD	1	1	1	1
d	1	1	1	0
ad|d	.9	1	1	0
bd|d	1	.9	1	0
cd|d	1	1	.9	0
~~base~~ MD	1	1	1	1

0	0	0	0	
.1	0	0	0	
0	.1	0	0	
0	0	.1	0	
0	0	0	.1	
.1	.1	.1	.1	