June 24th 2010

ESHMC

1. Chuck Brendecke
Stacey
Greg
Chuck Brockway
Roger Warner
Willem Schreuder
] callins

2) Allan Nylin presented the Snake inflow to Power between Milner Dam and King Hill

1969/ Thomas

2/3 return flow from Rock Creek, Cedar Draw, Deep Creek, Salmon Falls & above Kimberly gage

1984/ Kjelstrom

1999/ Kjelstrom

most information

Kimberly 92% of gains from ESPA
to Bulk 8% of gains from South Side

Bulk to Hagerman 5% from South side
Hagerman to King Hill - almost all from N. Side

2010 IDWR

TFCC diversions - ET service area all uses
lands - returns - Base Flow
(Mud Creek Rock Cedar
Deep Salmon Falls)

= residual ≈ ~~16%~~ 14-16%

2000-2008

RR asked - looks like IDWR
a little more

alla - previously 13% acknowledge

Chuck Brendecke - mostly dry
any impact

allen - 2000 a little higher because wet
years before

- all mod. chose

Bryce - look at Alla's table
Diversions not well correlated wet
drought

Brockway - dry years don't make
much difference

what about Salmon Falls underflow - not in balance

Allen agreed

Bryce - would ↑ %

* Chuck - look at underflow
contribute

Greg
subtracted baseflow?
Allan - yes
can you break out detail? yes A

Chuck Brock
- measured returns, certain % of total?
Sean - well over 90% measured
Bryce - Idaho Power study + Dick Fritz
well over 90%

Greg - how did you derive hydromet ET
Allan - ~~Agmet~~ Potential E record - look at Ag status
crop coefficient to compute ET for various crops
Greg - what use for irrig area?
Allan - GIS computed irrigated area for TFCC
Greg what year
Allan - used 2006 all irrigated lands included g. w.
Greg - difference betwe Metric & ~~Hydro~~ Agmet is concern?
Allan & Bryce - not a big concern
Greg - what % will you use?
Chuck - did you look at correlate betwe diver vs gains
Chuck - how do we use #
Allan - subtract of gage gains
- calibrate mode
Chuck & Greg - use actual + correlate

Allan - use Metric & adjusted Agrimet

- Bryan use ET Idaho goes back further than Agrimet

* Greg - do you have Rich Allen's report for Metric ET, use that info to help

Greg - we have TF total div, returns, ET so do calc every year

* Bryan Design doc with a spreadsheet

Chuck Brendecke likes us to use numbers instead of % Chuck Brockway

\# Brockway glad we looked at this & will have solution

Greg - is annual # shaping it monthly, will you do calc monthly

Allan no, not possible

Jim - not sure how to shape

Greg - what about using Donna's ~~[illegible]~~ response funct factor

1) could you use & compare

2) could fine report

Allan

Brendecke - base flow in S. Side tribs

Brendecke - baseflow?

Wylie - water flow is flat, subtracted
baseflow

Rock Creek - would be best one

Church Brockway - by using %, then transient response of S. Side is same as North

Bryce - not bad

Brockway
Church - might be as good as you can do, aquifer T is not the same on N & S side

Bryce - we don't know if Donna developed response function; recalled she came up with same # as Kjelstrom

Brockway - check again to see if we can find the response functions

Brendecke - if geology is different, use flat response

Greg - look anyway

Jim - multiple response functions? use % of gains or flat response funct

Brockway - we want a parameter to shape #'s, how about g. w. levels,

wells near rim or group of wells, fairly easy to do

Bryce - what about a gradient between wells to shape

Chuck Brockway - gradient would be represent of a flux, USGS wells in tract, pull data & calculate gradient.

Bryce / Allan / Jim / Chuck Brendecke
flat

look to ~~flat #~~ see what available, use flat

Dave Blew - how do your distribute spatially in reach

Allan - Kim - Bulk 8%
Bulk - LSF 5%
LSF - KH 0%

Kjelstrom 1995

2/3 1/3

Chuck Brendecke apply flat #

* Allan OK

3) Model

use MKMOD4.exe → Willen
~~use~~ on Farm algorithm
recharge fill P100608A

- No steady State targets
- Aquifer head
  1985 - 2002

Bryce why not 2008?
Alla - doesn't want to change all at once
- database problem

Reach gain ⟹ up to 2008
Spring discha

Brockway - will use ~~use~~ head 2008?
Alla - yes

- reviewed adjustable parameters for Reach Gain & Spring Discharge Targets
  T Sy Riverbed Conduct, Drain Conduct. Canal Seepage, NIR, ET, Perched R. Seepage Trib underflow, On Farm,
  ↳ gave range for increase/decrease allowing PEST to adjustment factors which factors fixed

Brockway - will PEST be constrained on NIP by Precip
* Alla - not sure; will check

Run results
Showed T maps, not a lot of difference
Sy, big difference

River bed conductance
Drains conductance
high for Box, Rayen

Sand Spring - included in TS Power Plant
if we could get data, subtract from #5

should Soil Map with Factors for NIR
get more recharge rock > thin > thick

~~told~~ ~~plot~~ PEST wanted to have different
factors with Thin/thick/Rock

placeholder

multiplier for calculated H

Church Brockway - chip to model bdy
Allan - men shows what model can do, MATT
Tell us what we might want to do, to
constrain PEST

how well it liked x

Church Brockway - put in adjusted % by color
Bryce - not sure how to do that

Jim - maybe PEST didn't want to spend time here
adjusting because other areas to adjust water

NIR - church Broch just under 10%, not
insignificant

show • ET (Adjust ~~factor~~) for S.W. Sprinkler
by PEST

• ET Surface Water Gravity

• ET GW Irrig. Sprinkler.

Bryce maps difference show what PEST did
* Allan can do

Showed 01 Farm parameters
sprinkle efficiency - Surface Wat
↳ what PEST said sprinkle efficiency SW should be
* Allan said not let PEST stray as far as it did
* Willem - PEST is adding water to match heads we gave it leash
Bryce - PEST is blundering in forest
~~Chuck~~ Chuck - throw out rationality with giving it long leash; Allan & Bryce - should constrain

~~Bryce - patch eff~~

Willem - Bryce right about trees need to give PEST guidance - give it nudge
Chuck Brendecke - getting sense where it tries to put/remove water
Greg - is there a way to find out what algorithm
01 - Farm tries to change E1
Bryce - yes

Chuck Brockway
are the limits global or by entity or by time step
- Allan - can be global or by entity now not by time steps

no penalties for strategy

DPIN - if not enough water to satisfy ET, forces some fraction to recharge?

DPEx - % of residual that becomes recharge

→ might want to constrain

Allan - give lots of tools, shorter ropes
vs
Bryce - give one tool at time

Broadway - A-J wants 0 recharge from residuals, residuals be returns
not sensible

Chuck - if diversion not adequate to meet ET, DPIN taken out

Chuck - is there a flow chart for On Farm
Bryce - yes from presentation by Willa & Greg
showed - results for runoff, recharge, efficiency by entity

showed factors for Perched River seepage
small potatoes

Trib underflow adjustments - no penalties
how much it adjusted underflow
Jim - constrain heads to be near center of range? Allan
Transient Heads (measured - modeled)
showed where simulated heads are high & low
problem at Ockley
stratified aquifer, alluvial + paleozoic + faults

model has difficulty matching heads at Oakley
red - model has to go up ↑
green model has to go down ↓
noted that
scatter plot of all wells with multiple measurements possible
Seasonal observations - ① wells ② mass mas.
Vers. 1.1 vs new run
③ trend wells (annual early spring observations)
④ river gains and losses
Shelly to NB in phase to 2000
then out of phase
NB - to Neeley about 2000
amplitude becomes too high

Willen - asked about stage changes
river gages and A.F. res.
Stacey - summarized
⑤ Gaged spring reaches
Km - Km observed
Km - LSF vs
LSF - KH matched
Km - Buhl
Buhl - LSF
⑥ Group A & B springs

Crystal - needs help from Chuck Brockway
fit not reasonable
version 1.1 much better
Chuck agreed to look at data
something not correct in IDWR database

Clear Lakes is combination of power & spring measurements
Allan & Chuck Brockway would like to get
spring measurements & eliminate power reach

Willen - we switched targets on model regarding
Thousand springs
there is a huge difference in data for discharge
IPCo - Dave Blew will check

Jim Brannon - is there a big problem for model
to try to meet different target

Allan - not a big problem for model

Chuck - reach gain targets & spring targets
what are relative weights

Allan - ~~sum of all head obs~~
explained how weights were assigned
for new model

Chuck - not weight of reach gains less than
springs? True? Gains below Milner

Check relative weights to springs vs reaches as targets

allan A & B spring] 20% more weight than
C spring
reach gains

good match at Ranger

C springs - Covington & Weaver
good match
add more weight

John Korenny asked about LSF to KH
Blue Line (measured) doesn't make sense

consider
- throw away data if you don't understand
Allan - can make runs and give lower weight
- can throw away
- when we adopted data, we discussed difference in data, hoping that weighting time lighter, wouldn't hurt

Bryce - can keep sum

Chuck Brandeck - have to keep reach gain target in, ~~[illegible]~~

Allan - just K - KH & breakdowns lighter

Kim - LSF ok also

John - can we clean data up?
Allan - can't make it better

Allan - have an average for time period
have PEST match the average

John - don't use bad data
Allan - OK, Thousand Springs & Crystal
something wrong

Brockway

Blue

Kerry - opinion of 1 months
Wylie - doable, will be beneficial for
river gains & losses to get the
in phase
Willem - why not beneficial for springs?
Allan - monthly allows wrong to start early in south
end late
- big benefit to river simulation
- change stage in river, doesn't affect
springs
∴ Allan - we are closer than we were in version 1
when we had final data set
C. Brockway Why still out of phase in Shelley to NB
Allan - only for last 8 yrs, partly PEST using
in Farm tool box to match amplitude
more than should have
Bryce - maybe a problem with Irr Lands
dataset
Allan - more tightly constrain On Farm,
tie to entities above & below AF
Bryce - look at starting parameters in EFF file

Bryce - efficiencies should be higher

* Allan, Bryce - have a conference call on On Farm adjustable water budget parameters constraints

Bryce - July 24th - maybe not Bryce

all interested email Allan

Willem - July 7th

4) Recharge on non-irrigated land,

semilog kriging McVay

Geostatistical Analyst - M.

Willem wrote own script

selected 30 months - soil types combination to compare results

- good comparison

Calculating recharge

P_r2 - moisture in root zone available for ET

$$P - P\_r2 = \text{Re}\cancel{\text{charge}}\ \text{unoff} + DPer$$

~~Recharge~~

Discussed 3 problems

- some could be sondy errors, some measurement errors
- received input from Dr. Allen
- will discuss further with Phil A.

Bryce & Willem questioned input

↳ suggested P - ET actual

Allen
suggested Tabling this until Dr. was able to discuss

Willem - almost nothing over 7 Macro add drop

Allen - assumption that bare rock has more recharge is good, it is possible that this is not more than thick.

Bryce - above 0, this is always more than thick

Allen agrees

Greg - why don't we model soil moisture on irrigated lands

Allan - intend to implement a soil moisture model on irrigated lands

Willem - has animation on his web page

5) Synoptic g.w. level measurements
- utilized work by Nathia Erickson
- using version 2.0 gwd

- data issues on Gexburg Bench
- will post spreadsheets on web site

c) Jim Brannon reported on progress of review of Willem's on-farm water budget code. Willem - running PERL code takes time on Version 2.0. Re write in Python because it will run faster - thinking of that.

Bryce - FORTRAN faster?

Willem - Fortran is 10 x longer code - need to write in more powerful form of expression

Chuck Brockway - will it affect model users

Willem - no

Discussed whether or not to go with Python

Bryce - make sure code anticipates all input data so they are appropriate

Willem - Python purely a performance issue

Allan - agrees running faster is big advantage

Chuck Brocky - how long develop code in Python

Willem - 2 or 3 days

Jim - will you be adding new features

Willem - no, just more efficient

Chuck - motion to allow Willem to proceed
Willem - will work in parallel
get ready for serious calibration mode
* IDWR maybe GIS
Python maybe dropped by ESRI

Jim - delay PERL code review?
Willem - no
Greg - will write up what we expect
algorithm to do
Chuck Brendecke - worried we need paper
documentation; don't want model be
source of disagreement - still in favor
of turn around time

Brockway - we are in full speed ahead continue
with PERL; we wait for Willem to report
on merit of Python

Bryce - abandon algorithms

Chuck Church, & Bryce Willem
stay on path

7) National Fish Hatchery - Jim Brannon
looked at data, large complex of springs
do we data quality for B Target Spring

showed facility
measurements recorded since 1993
Large springs back to 1965
schematics of plumbing
① each described
② photos
25 locations to measure
uncertainty at Riley & Bickel
includes Brailsford Ditch diversion
Riley, Bickel, & Main - largest
Spring 10 - smaller

showed % of total flow for Bickel
Riley
Spring 17
Main Spring total

Then showed total flow
used Riley to project back to 1979

Brockway - does Brailsford include pup
creek?
Jim - not sure

showed raw data including 3 springs back to 1965
- offered to provide documentation
- Church Brockway
  - any correlation to springs outside complex?
  - looks similar
Jim - no, wonder about relationships with Ranger
Church Brendecker - all measurements accounted for?
Jim - all but maybe small amount in slough
will check with Brian

(8) Bryce - reviewed where threaded discussion

- announced he has joined RMENV.
- will complete design docs
- water budget
- final report

ESPAM 2 status
irrigated lands dataset

Church Brockway
what tools are you thinking of

Bryce - take READINP and graph & join in GIS

Creating tools in VB6, they're executables

Chuck Brockway
I don't see how we can say we won't need tools
Bryce: I used tools
Alla: I assisted & used tools
Chuck Brockway
will consultant need tools?
Bryce
depends on what needs
if want pretty fully populated water budget will need tools
Willem
- on Rio Grande, more tools needed
- created tool to write summary tables
Bryce - does it hook to GIS for spatial display?
- can make tool spit out data or call by self & the hook to GIS
Chuck Brockway
- can't anticipate all tools
Jim Brannon
- would have his own approach
Chuck Brendecke
retain original 1.1
retain red line
publish 2.0
Bryce - good idea

(9) Water Budget Version 2.0 Training

- provided goals of training
- demonstrate how consultants use tool/model

provided options
- GoToMeeting
- audio & video could be recorded

Chuck Brockway
: break it up,
: favor remote distribution
: likes recording, GOTOMTG works well

Willem
: fully agree w/ Chuck
: start with short introduction & Borus overview

Jim
: do intro, people say what they want to learn
: Browser based tools that Jim will investigate

Greg used VIEW
have model & tools

2010
@ POD file Point of Diversion shape
brief overview by Alla GIS file
used before presented
- ground water irrigation wells
- used in curtailment scenario
transfers/adjudication

showed growth in # of points of div

2006 ⟶ 2010 ⟶ 20095

orphan PODs

get from Michael Asell

Brendecke

I what happens to transfer to commercial

would see reduction of water rights not actual

reduction of consumption use

Wylie - that is true

Brockway - how do we account for consumption

use of dairy

Bryce - ignored

Brendecke - transfer makes water use invisible

Allan - priority data vanishes

Brockway - should quantify

Allan - noted jump in enlargements in 2009

summarized results of test runs

net effect in trim line

in target reach

6/25 ↓

(10) CAMP Implementation - Brian Patton

ultimate plan 600K AF
water budget change

≈ $600M, 30 yrs

split off Phase I 200-300K water bdgt change
$100M

100K AF Managed Recharge

Calendar year 2009 startup implementation
≈ 125 AF managed recharge
7 canal companies participate

today 2010 priority right back on/off last Tuesday Wednesday
up to 62K AF

weather modification
locally run program increase precip by 1-2%
goal 8-10%
part of IPCO contribution
initiate weather mod in upper Snake
up to 9 generators 2009/10
IPCo evaluates effect on pric & runoff

AWEP funds to assist in implementing CAMP
2009 - 15 ground to sw conversions 4300 ac
- below rim Thousand Springs improve 18 cfs
efficiency of spring use

AWCP - fed provide 75% of funds

2010 projects
demand reduction SW to SW
metering, canal regulatory ponds

Funding Mechanism - ~~not~~ delay
- concerns about legislation & who should be assessed, legislation held

Governor's rally March 2
- re-affirmed commitment to CAMP
- unanimous consent to stay at the table
- governor made $2M available
  - reappropriated from Water Board existing funds
- continue work on funding mechanism
- recommended 5 projects

Water Board & Gov reviewing projects
Funding committee meeting next week

Chuck Brendicke
- details on web?
Brian - yes

Jim Brannon
hold long on AWEP
Brian - 5 yr. term depending on yr/to yr funding levels
could go beyond 5 yrs

Dave Blew - hope for CREP
Brian - very little action
CREP enhancement funding stalled

Harvey - paperwork for CREP enhancement
out for farmers to review

C. Brockway - facilitator?
↓ CDR contract ended
↓ Rich Rigby - Bureau - will work for
water resource board
Intergovernmental loan
housed at IDWR
↓ preparing letter to implementation committee
explain change over

C. Brendecke - Reclamation active CHM
participant
Brian - yes
↓ anyone else to replace
↓ he won't wear 2 hats, anticipate
Matt Howard replace

Greg - how long Rich

Brian - 2 yrs

Brockway - recharge credit
how are they recharging?
Brian - in canal until irrigation stakes
then required to go offsite
Fremont Madison
A-S
Milner Gooding

any recharge on Wood? Brian - No
Working with Watermaster, sight did
not come on

(11) ESPAM 3 status

IWRRI new contract for data
gathering & water budget calcs

Who/Will oversee Water Budget?

Refinement of Method?

Brockway
- talked about wiping the slate clean
on algorithms, is that plan
Contor - that is where were headed
Metric processing accumulated

Chuck Brockway

? any thing you can't do if we utilize in just Metric

Bryce - can't think of anything

Wylie - only problem is cloud-free days

Mary

My Yard

Bryce - NOAA method

John Lindgren - what is plan for process

Bryce - we have a proposal for interpolation

Chuck Brockway - what is purpose of interpolation

Bryce - Take care of cloud free days
we can test it

Brendecke - support of using / moving to Metric

Bryce potential contract to explore

(12) ESPAM 3 Design components

reviewed objectives from 2007

showed dual track schedule
new model by 2014

- Talked about incremental change
vs BIG change

- Bryce & Allan talked about well to well interactions

Chuck Brockway
- need to talk about how it will be used in Administrative
Greg - brainstorm model use?
Chuck Brock - is transfer tool we essentially do well-to-well, said we would do that - so we have a different than what it was designed to do
Burdick - need to poll Board & Director
Brockway - can we design & develop tool that works for what Dept is asking
Sea - do we see changes in terms of our needs
Allan - not sure where policy is going
Brockway - calls → used for mitigation requirements, credits, impact on springs or groups of springs
model could do better, harder
easier for IDWR if model more robust answer
- what kind of question will Dept have to answer
Wylie - intent of update 5 yrs or more often to keep up with changes
Brockway - agree, good policy, but still need framework
Jennifer
working on using modflow output with analytic element model / GIS based
does well to well

Sean - one good thing not processing new apps
applications new water rights
Brockway - but we transfer processes
Bryce - any place well to well is problem
tough T aquifer, don't need precision
after a mile or 2 from site
Allan - for Version 3, all folks gave
start from square 1, what do we need tool
to do
Brockway - how estimate impact to individual
springs, improve model capability
to simulate individual springs
Wylie - ESPAM 2 does better
- hope ESPAM 3 goes further

Sean previous comments
- multi-layer model — check slide
- transport calibration
- subregional models
- ~~transport~~ improve Trp underflow

- brainstorm & prioritize

Chuck Brendecke
- first define requirements
- where do we want to go, model will be asked
to do over - more detailed analysis

Jim Brannon
- doesn't all have to be in "the" model
- could be a tool

Allan - first job is to address calls
aquifer river interactions

Chuck Brockway - agree with Allan
probl with disconnect with rights in river
with g.w. model
- what is impact of impact of res. storage and
carryover? Is there potential to combine
should be explored

Sean - agrees, is area for improvement

Brendecke - what is Dept doing on accounting
& planning

Sean - far along on accounting rewrite, test
on Payette, GIS interphase
modular routines
Brendecke - any interaction with g.w model
Sean - no, accounting model is after the fact
Planning model - look at alternatives
but have not made progress
Dave Blew - IPCo looking at River Ware
Jennifer - Bureau looking at converting
upper Snake Modsim to River Ware
plus interphase with GW model

Brockway - proprietary - ~~Mods~~ Riverware
Jim - yes, $2K estimate
does it have accounting module
Jen - yes with water rights

Greg - caution, pure plus appropriate
Upper snake is done by accounting
to implement

Sean - inserted spreadsheet
↓
multi-layer - thousand ramps & river
impacts
↓
Bryce - data constrained
- Henry's Fork may be more connected
to perched layer, multi-layer could
- be an improvement
Allan - data constrained, obligated to
go with variable T, can be a big issue
Bryce - make top layer a constant T
Allan - make T variable over time
Chuck Brockway - no way to have well
multi-layer → have incomplete set but
Brendecke - we need problem statement
Allan - need tool to help address calls
Brockway - assume we can build multi-layer
how would it help
Wylie - not convinced it would
Greg - is purpose to help with springs
Wylie - variable T would help but not sure
we are at edge, change in head upstream
change in T to greater extent than in
middle of plain
Greg - will model run unconfined?
Allan - yes, go there before multi-layer

Greg - could you have multi layer near springs?

Allan - make mult-layer around ~~springs~~ river
& Oakley Fan

Sean Transport - calibrate to T° to help with
Tributary underflow

Brendecke - might help with transmission zones
that feed certain springs
feels that conduit flow

* Dave - look at tracer tests, work done in rim
area, indicates preferential flow paths
RR agreed

Bryce - could improve capability to represent
springs

Allan - could look at heat, transducers are deployed
need to look at data density to determine if
adequate

Dave - noted discrete differences in T° in
individual springs

Sean: subregional models
Jennifer: analytic element models are good but SS
Sean: how about nested finite difference models
Allan - How about subregional in area of
springs?
Jim: good idea but you have 2 models
Bryce: difficult to propagate across bdy
Chuck Brendecke: keep in mind as option
Sean: Finer grid - Chuck Brendecke - related
Allan - could entertain, effort minimal

Alla - may not buy us much, 1 x 1 mile hard to believe finer would improve
Brockway: finer grid better resolution but give false sense of model capability
Brendecke - transport stuff higher priority
Sullivan - look at how we represent S.W. entities
Bryce: made entities small, have to have data entry divisions to subdivide entities service areas overlap, so hard to tell need to interview famers or canal cos, Greg is right need to link to diversion → returns

Sean: earlier start
Alla worried data limited
Brockway → not a big priority
Greg - interest in knowing when things were before development
Bryce ~~is~~ not making up data a good way to answer

* Brockway: evalute where model needs to go and what will model be asked to do
Jim - define requirements
- agrees with Alla with reach 7
Alla: - have to keep cells from going dry
Bryce: calibrate constant thickness?
Jennifer - is there a newer algorithm?
Alla - yes, creates more instability
Bryce - variable T, Kay & Stacy develop way to develop response function for a variable T unconfined model

* Church need Gary to tells us about his work

T
Trib underflow
Church Brockway would like to hear what Stacy is doing
Bryce - look for wells to determine seasonality of flux

Sean Soil Moisture
Vadose Zone
Root Zone implemented MKMOD4

Brockway - aren't we limited on soil moisture
Bryce - Willie has crude assumptions that are better than nothing; if we go to strict representation of Metric we will consider soil moisture
Sean - important to temporal stress
- anisotropy horizontal
Church Brendecke - related to transport calibration to get a better handle on where there might be preferential flow
Brockway - worried about how to model preferential flow, needs to keep horizontal anisotropy in mind
Contor - deal with faults on Rexburg Bench not enough data, so we ignore
Brockway needs to be addressed; Roger would concur
2002 irrig. lands / 2006 / 2009 → NASS can extract good irrigated lands data with

Linda: not sure how good NASS data will be
but will have to spend time with it

Bryce
Canal Seepage
do we updated hydrography
important for non-farm water budget

Greg - using Metric directly, are we locked to crop distribution for that year, could we want to know about conversion for how water use crop

Bryce: That is scenario

Greg - agreed better to go w/ Metric for calibration

non irrigated recharge
Bryce potential for PRISM/METRIC
find a new algorithm
now use different interpolate for precip than recharge

non-irrigate pumping
Brenda how big & difficult to implement
IDWR how many, how much consumption

Brockway - domestics
- are your models all use
- should we try or are they de minimus
can GIS separate?

Bryce - don't need to

Brockway