

## **ESHMC Meeting Notes November 9<sup>th</sup>, 2012**

**Item 1 -** Introductions were made, and an attendance list was circulated. The following were present at the meeting:

- **Rick Raymondi**
- **Allan Wylie**
- **Jennifer Sukow**
- **David Hoekema**
- **Mike McVay**
- **Sean Vincent**
- **Bryce Contor**
- **Dave Colvin**
- **David Blew**
- **Chuck Brendecke**
- **Chuck Brockway**
- **Mat Weaver**
- **Gary Spackman**

**Greg Sullivan, Stacey Taylor, Rick Allen, Jim Brannon and Willem Schreuder joined the meeting via polycom.**

**Item 2 -** Rick Raymondi began the meeting and announced that Jim Brannon had left Leonard Rice Engineers (LRE), but was still performing work for LRE as a subcontractor. Bryce Contor said that his contract with IWRRRI had been terminated. The committee requested that IDWR include all meeting attendance lists in a separate folder, and IDWR agreed.

Stacey Taylor briefed the committee on the progress of developing the final report. She said that the figures had been updated and sent to IDWR, so the revised draft included updated figures, tables, and appendices. The revised draft had been posted for committee review. In the mean time, Stacey had received comments from Mike McVay and Jennifer Sukow which she was incorporating. Greg Sullivan said that there were many directories in the report folder, and he was not sure which one contained the current document. Stacey said that the draft dated October 10, 2012 sent out by Sean Vincent should be reviewed. Willem indicated he had two comments, and Allan Wylie said that he had received them.

**Item 3 -** Jennifer Sukow presented an overview of the Mud Lake seepage calculations, reported on the recent discovery and investigation of mistakes, and provided recommendations for improving the Mud Lake area water budget input data. She said the documentation indicated that the calculations for ESPAM2.0 were done the same as in ESPAM1.1, but there was a significant difference in the values. Jennifer conferred with Stacey who sent a spreadsheet showing the calculation of Mud Lake seepage. Jennifer showed a conceptual diagram prepared by Bryce Contor illustrating the water budget components in the Mud Lake area. In ESPAM, the water budget components include seepage at the

Camas wildlife refuge, seepage at the flood control site, seepage at Mud Lake, groundwater pumping to Mud Lake, and surface diversions to the Mud Lake entity and the Camas entity, non-irrigated recharge, wetlands ET, and ET on irrigated lands. She indicated that precipitation and wetlands ET for Mud Lake were handled separately in the NIR and wetland ET datasets, and were not included in the calculated of Mud Lake seepage.

Dave Colvin asked if there are other wells in the Mud Lake area. Bryce said there are on-farm irrigation wells in the Mud Lake area that do not pump to Mud Lake. Jennifer said that the groundwater fraction in the water budget represents the source for the Mud Lake irrigation entity as if 100% of the water supply was pumped from Mud Lake. She added that the groundwater fraction could be adjusted to represent the on-farm irrigation wells and eliminate the deficit irrigation that is currently represented in the model. She added that the deficit irrigation is not a big number, and the change to the water budget would be small.

Jennifer then summarized the data review and said that corrections were made to the seepage calculations and Mud Lake well pumping data. Monthly data were found to replace values estimated from annual or average data for diversions to Mud Lake entity IESW029, the Camas Wildlife Refuge the flood control site, and the Dubois entity IESW051. Stacey Taylor then reviewed the revised Mud Lake seepage calculations, and a memorandum describing the revisions was posted on the committee web site.

Jennifer then provided the committee a comparison table showing the recharge components in ESPAM2.0 vs. the revised pre-PEST input dataset. She indicated that the net change in pre-PEST recharge in the Mud Lake areas was -88,818 acre feet (there is less net recharge in the revised dataset). She also showed graphs of the new and old time series for Mud Lake seepage, Camas Wildlife Refuge seepage, the flood control site seepage, Mud Lake diversions, Mud Lake pumping, and Dubois diversions. Bryce pointed out the “Big Mountain/Little Mountain” features on some of the graphs. Chuck Brockway asked for a description of “Mud Lake pumping”, and Jennifer said it was groundwater pumped into Mud Lake, the Mud Lake diversions are the water pumped out of Mud Lake. Chuck Brendecke asked if Mud Lake was the end point for the water, and Bryce said yes, adding that there are no returns to the Snake River.

Jennifer then provided the committee a comparison table showing the recharge components in ESPAM2.0 vs. the revised pre-PEST input dataset. She indicated that the net change in recharge in the Mud Lake areas was -88,818 acre feet (less recharge in the revised pre-PEST dataset). She also showed the new Mud Lake seepage, Camas Wildlife Refuge seepage, the flood basin seepage, Mud Lake diversions, Mud Lake pumping, and Dubois diversions vs. the old on graphs. Bryce pointed out the “Big Mountain/Little Mountain” features on the graphs. Chuck Brockway asked for a description of Mud Lake pumping, and Jennifer said it was groundwater pumped into Mud Lake for distribution. Chuck Brendecke asked if Mud Lake was the end point for the water, and Bryce said yes adding that there are no returns to the Snake River.

**Item 4 -** Stacey Taylor presented the results of a water budget data review that she performed at the same time that Jennifer Sukow investigated the Mud Lake seepage issue. She showed a table that summarized her recommendations for changes in data for 8 recharge components. The recommended changes were relatively small, and the net change was reported as 9,887 acre-feet/year. The components included IESW008 (Blaine) diversions, IESW053 (Howe) diversions, exchange wells, Beaver Creek (reach 2) seepage, Birch Creek (hydropower) seepage, Little Lost River seepage, Goose Creek tributary underflow, and other tributary underflow. Stacey said that the changes in other tributary underflow resulted from updating the Silver Creek flow data (average values were replaced) used as index values order to shape the tributary underflow data. Bryce said the “Big Mountain/Little Mountain” trend was evident in the data.

Chuck Brockway asked if the changes in index values were significant, and Stacey said the changes were very minor and only for the last few stress periods. Chuck Brockway then asked what changed when the Silver Creek index values were updated. Stacey said just the last year. Bryce commented that it did not change the base number. Jennifer Sukow said it made very small changes in the last few stress periods. Chuck Brockway asked if these are pre-pest input data changes, and Stacey said yes.

**Item 5 -** Jennifer Sukow briefed the committee on the final compilation and posting of the revised water budget data. She said that the revised data were entered as input to the model tools and MKMOD. Then she said a new water budget was created and posted on the committee web page. Rick Allen commented on the number of significant figures in the input files. Jennifer said the data were simply the input to the model, and she did not intend to indicate the number of significant figures represented data accuracy. Chuck Brendecke said that the PEST adjustment factors are scattered over 3 different tables, and he asked if the factors could be summarized in one place, possibly in a table showing the range that PEST was given or allowed and where it ended up. Allan Wylie indicated that IDWR would create another appendix for the final report with that data.

**Item 6 -** Allan Wylie discussed the recalibration of the model using the new water budget E121025A001. He said that because of the issue in the Mud Lake area, he set the starting values for tributary underflow from the Camas Creek and the Henry’s Fork basins back to 1.00, and changed the starting value for the transmissivity pilot point near Mud Lake from  $1 \times 10^{10}$  to  $1 \times 10^8$  ft<sup>2</sup>/day. David Hoekema asked if all other starting values were the ending value of the last calibration, and Allan said yes. Allan showed comparisons of the calibrated transmissivity, specific yield, riverbed conductance, drain conductance, perched river seepage, tributary underflow, DP<sub>in</sub>, DP<sub>ex</sub>, and the mean residual of head values for both ESPAM2.0 and calibration E121025A001. Allan then showed a comparison of the calibrations for the Snake River reaches, the base flow, and the spring targets.

Chuck Brockway commented that he was not sure what PEST is doing. Willem said other things besides Mud Lake changed. Allan said he had more to show so that the committee could understand what happened. Chuck Brockway asked if Allan had

looked at the boundary node flux at Heise. Allan said there were very large changes between ESPAM2.0 and calibration E121025A001 in the tributary underflow from the Henrys Fork and Camas Creek basins. Willem said that PEST is smarter than us, and that in ESPAM2.0, because the Mud Lake seepage was too high, PEST compensated by setting the multiplier for tributary underflow from the Camas Creek basin too low.

Willem then commented that recharge from non-irrigated lands (NIR) went up in most areas. Jennifer Sukow agreed and said it increased about 25%. Chuck Brockway said that since NIR went up in most areas, the whole model layer gets more water. Jennifer said that in calibration E121025A001, PEST made up what was lost in the reduced seepage at Mud Lake by increasing NIR. Willem said that in ESPAM2.0, there was excess water because of the inflated seepage at Mud Lake, so PEST suppressed NIR, and DP<sub>in</sub> and DP<sub>ex</sub> were kept about the same.

Allan presented the mean residuals for the head matches. He indicated that the standard deviation was wider, and the inner quartile change was higher in the new calibration. Allan said the new calibration shows the water table is now at land surface in the Kilgore area. Regarding the reach gain matches, David Hoekema commented that there was not change between ESPAM2.0 and calibration E121025A001. Allan agreed and said that all matches are about as good as the previous calibration. Allan indicated that for some of the springs represented by 2 drains, there was a reverse in the relative volumes discharging from the upper and lower drains between the two calibrations. At Devil's Corral, Crystal, and Three Springs the upper drain decreased in flow, and the flow in the lower drain increased. At the National Fish Hatchery, the upper drain increased, and the lower drain decreased in flow. For the returns at BID and Northside, Allan showed minor changes, but he said that most other sites showed no change.

Dave Hoekema asked if the transmissivity and storage comparisons had been shown, and Allan said yes. Bryce said the new transmissivity map doesn't have quite the ranges as the map for ESPAM2.0, and Allan agreed. Chuck Brockway asked what is the bottom line regarding calibration, and Allan said the new calibration is as good as the previous, and the objective function is the same. Willem said when you look at applying the model in superposition, you would have essentially identical results and the sensitivity is the same. Dave Colvin asked if a difference map could be prepared for transmissivity, and Allan said yes. Willem commented on differences in the range and the extreme values of transmissivity and said it was hard to interpret. Bryce said a ratio map (new T/old T) instead of a difference map would be better. Jennifer Sukow said both maps were prepared for the comparison between ESPAM2.0 and ESPAM1.1, and could be prepared for ESPAM2.1.

Bryce said he was surprised by in the change in the steady state response function and wondered if it was a result of a blunder. Willem said the dark band (relatively high transmissivity) from Mud Lake to the American Falls reservoir was still intact, and he commented that the response functions should not change. Chuck Brendecke said he expected to see differences in the top end of the model with the fix of the error in the

Mud Lake area, but he did not expect impacts at the springs in the new calibration. Bryce said he expected more change in transmissivity near Mud Lake and was surprised with the perturbation of effects throughout the model. Willem said that the committee could “lock down” the springs, but we do not know if ESPAM2.0 was a perfect calibration. Greg Sullivan said the calibration could be done in a number of different ways.

Allan said that the spring conductance is a number that PEST can adjust. Greg asked why there was a reversal in the upper and lower drain discharge. Willem said the biggest changes are in water levels, and that spring flows can be matched by moving water to the upper and lower springs. Willem added that the water levels are not very well constrained, and he suspected inconsistencies in observations. Chuck Brendecke asked if there was more weight placed on the springs as opposed to the water levels. Allan said no and there were not as many observations. Greg Sullivan asked if this type of change with the model not being well constrained could suggest an area of uncertainty. Allan said that the uncertainty in this area is the lowest. Willem said the total drain conductance did not change, it just shifted between the upper and lower drain. Allan said the total global correlation coefficient for ESPAM2.0 was 0.993 and for EPSAM2.1 is 0.9993, and he said the weights were not changed.

Chuck Brockway asked if this is the best measure of reliability. Allan said you can have a good correlation coefficient with a somewhat wrong conceptual model. Chuck Brockway asked what parameter tells us the calibration is as good as or better than a different calibration. Allan said the correlation coefficient. Willem asked what the correlation coefficient is, and Allan said it is PEST output. Willem said the phi tells us the goodness of fit, and he added that the new model calibration provides matches that are as good as the old version. Mike McVay concluded by saying that we fixed the mistakes and we now obtain the same general output, so the new model version is better.

Bryce asked if the steady state response functions had been posted, and Allan said the functions were done but not posted. Dave Colvin asked if the observation data were weak in the Mud Lake area. Allan responded that since the underflow is not known, PEST took advantage of this uncertainty and used it to compensate for errors. Jennifer Sukow said Mike McVay has looked at driller’s logs and he confirmed flowing wells in the Kilgore area, but there are no calibration targets there.

**Item 7 -** Allan Wylie presented a proposal for filtering reach gain data to obtain a better calibration and reduce the predictive uncertainty in the next version of ESPAM. Allan used ESPAM2.0 for the experimental runs, and he utilized PEST to match both filtered and unfiltered reach gain data. He said that he split the weights evenly between the filtered and unfiltered data, and did not change the riverbed conductance limits.

Allan went through the various parameters (transmissivity,  $S_y$ , riverbed conductance, spring conductance, tributary underflow, NIR, reach gains, spring discharge, etc.) comparing the current ESPAM2.0 calibration with the filtered/unfiltered calibration. He

noted that in the filtered/unfiltered calibration,  $S_y$  decreased west and northwest of the confluence of the South Fork and the Henry's Fork, the riverbed conductance increased in the Ashton to Rexburg reach, small increases and decreases in the spring conductance and NIR occurred, and the perched seepage increased for the Malad River.

Chuck Brendecke asked how the filter works. Allan explained that it is a Butterworth filter, and it has been used for a long time. He said it behaves like a moving average, and it allows the user to define a beginning and end point for the runs. Dave Colvin asked how the filter obtains data at the beginning of a run, and Allan said that it is assumed that conditions prior to the first point in the data set were equal to the first data point for some period of time.

Allan said the best thing to do is to find the source of error in data and remove it. The next best thing is to filter the data to reduce the range in uncertainty. Allan recommended that the committee consider filtering for the next version of ESPAM.

Greg Sullivan said that we went through this discussion a long time ago, and the committee decided it was not appropriate to use filters because it was important to match seasonality in flows. Greg then said it seemed like we were going back to a previous approach. Allan said the difference is that he is proposing only going half way back with the filtered/unfiltered calibration, and he felt that PEST is still matching the seasonality well. Allan said in his opinion, there are no negatives to this approach, plus there is some improvement. Greg said that before we thought we had a good calibration, but the appearance was better than actual. Willem said that we should do filtered and unfiltered gains to get the long term average right plus the phase of the seasonal fluctuation right. Dave Colvin asked if there is the same weight number for filtered and unfiltered targets. Allan responded said that he divided the weights 50/50 to filtered and unfiltered and that the net weight to heads and flows is the same.

**Item 8 -** Jennifer Sukow began a discussion of the significance of the Mud Lake water budget revisions and indicated that the post-PEST average annual tributary underflow increased significantly in the Camas basin, decreased significantly in the Henry's Fork basin, and increased slightly in the Beaver Creek basin. She also said that the average annual net recharge from tributary underflow decreased, perched river seepage decreased, and NIR increased. Finally, she added that the spatial distribution of the recharge changed, but the total post-PEST average annual net recharge was approximately the same as in ESPAM2.0, at 5.18 MAF/year.

Then Jennifer discussed the 1870 curtailment scenario comparing the results from ESPAM2.0 vs. E121025A001/ESPAM2.1. She said that most reaches showed modest changes to no change in response (cfs) to curtailment with the new calibration. The greatest change was a decrease in the response at the Neeley to Minidoka reach. Most Group A and B springs showed a modest difference in the response to curtailment both in the transient and steady state responses. Finally, Jennifer showed that there was not much of a difference in the head response to curtailment.

With the next set of slides, Jennifer compared the results from the 1961 curtailment scenario using both ESPAM2.0 and E121025A001/ESPAM2.1. She showed similar types of changes as for the 1870 curtailment. Chuck Brendecke noted that for Crystal and Clear Lakes, the changes were the opposite (the response at Crystal increased in ESPAM2.1 and the response at Clear Lakes decreased in ESPAM2.1). . He asked about the head distribution in the Thousand Springs area, and Jennifer said there was not much of a change based on the 1870 curtailment. Willem said that in superposition, the drain elevation doesn't impact the results, but the drain conductance does. Allan said a small adjustment to aquifer properties will impact the spring discharge.

With the next set of slides, Jennifer compared the results from the 1961 curtailment scenario using both ESPAM2.0 and E121025A001/ESPAM2.1. She showed similar types of changes as for the 1870 curtailment, and in general, the response totals were smaller for the E121025A001/ESPAM2.1 run than for the ESPAM2.0 run. Chuck Brendecke noted that for Crystal and Clear Lakes, the impacts were the opposite for the two runs. He asked about the head distribution in the Thousand Springs area, and Jennifer said there was not much of a change based on the 1870 curtailment. Willem said that in superposition, the drain elevation doesn't impact the results, but the drain conductance does. Allan said a small adjustment to aquifer properties will impact the spring discharge.

Greg Sullivan said he noted that the drain conductance at the springs changed more significantly. Chuck Brendecke added that in the end, we get a similar calibration. Bryce said that he noted little change in the ability to calibrate the model. Greg Sullivan said he was still surprised with the level of change given the Mud Lake correction was so far away. Greg asked if it can be explained how the correction rippled through the aquifer to get a 10% change at Clear Lakes. Jennifer responded that the aquifer system is connected between Mud Lake and Clear Lakes, and now with better data in the Mud Lake area and an adjustment to ET in the Northside area, other areas of the model are affected. Chuck Brendecke said he was surprised by the small change in the upper part of the aquifer and the larger change in the lower part of the aquifer. Jennifer agreed and said that the gains in the Ashton to Rexburg reach did not change at all.

Willem said he gives PEST credit for correcting or compensating for the mistakes in the Mud Lake area in ESPAM2.0. Chuck Brockway said the match between version 2 and 2.1 is very close, but the components that changed are larger than we thought. Chuck Brendecke said that there are multiple solutions with combinations of parameters that will give us a calibration that doesn't change much. Bryce said there is a huge parameter space with alternate realities, and any one is as good as the other. Greg Sullivan agreed and added that there is uncertainty with the model input. Bryce said that the changes were not large.

Willem noted that there is 5.18 MAF of input with set reach gains and spring discharges, and the model actually got back to the same point. Dave Colvin said in

looking at the predictions, PEST got to the same point with a different set of input. Jennifer said the biggest difference at the springs was about 10% with a huge difference in input at Mud Lake. Greg said the Mud Lake seepage is a small % of the whole seepage volume, but the % change at Mud Lake is large. Mike McVay said the Clear Lakes discharge is a tiny % of the total discharge. Allan said that the 10% change at Clear Lakes is the largest impact, and it gives him confidence in the model.

Greg Sullivan asked how much uncertainty is associated with the Northside Canal seepage and how that level of uncertainty would ripple through the aquifer. He then stated that there is a lot of uncertainty with the Northside canal seepage. Allan said the Northside seepage evaluation would be a bad experiment because the canal is so close to the springs. He said evaluating the uncertainty with the AFRD2 seepage would be a better experiment. Willem asked what would PEST adjust if we reduced the canal seepage in the AFRD2 service area. Allan said that PEST would adjust NIR in that area. Bryce said that a better experiment would be to increase seepage because then you would have to change the water budget. Allan said you would have deficit irrigation.

Chuck Brockway said that if canal seepage was reduced, PEST would get water from somewhere. Chuck expressed the concern that Greg is saying that you can't use the model for individual spring simulations. Greg said that he did not say that. Willem said that if you are not sure about canal seepage, then you should give PEST room (not have tight limits). Allan said the decision was intentional to fix canal leakage, and we told PEST that the experts (Greg Sullivan, Chuck Brockway, John Koreny, and Chuck Brendecke) are right. Greg said that this discussion illuminated some uncertainty that was previously discussed.

Dave Colvin said that the predictions are not changing, and even if we have uncertainty in parameter estimates, the results show the model is improving but not substantially. Greg Sullivan said that a big change was made regarding the seepage at Mud Lake, and the change at the springs was surprising. He asked what would have happened if the change was made closer to the springs. Willem said that the springs are fairly well constrained. He added that there is randomness, but it is not cumulative, and the impacts cancel out because the water budget is fixed. Jennifer said that there is less change at targets with better matches, and that the Group A and B spring responses are well constrained.

Greg Sullivan said that what happens to spring conductance and transmissivity in the area is important. Chuck Brendecke said that regarding a small change, if it changes the conductance in a drain in superposition you take the change with you. Jennifer said that this is not the whole story because there are also corresponding changes in transmissivity that are included in the superposition version of the model.

Willem showed the drain conductance in certain springs for version 2 and 2.1. He showed a fairly substantial change in the Clear Lakes drain conductance. Chuck Brendecke said when you go to superposition, you only get a head change, so the drain

conductance is important. Jennifer responded that transmissivity has a big effect on a superposition prediction and that the transmissivity field around a drain cell is also important.

**Item 9 -** Allan Wylie presented an overview of the new steady state response functions including maps of the responses to the river reaches and some of the springs that allow a comparison of ESPAM2.0 vs. E121025A001/ESPAM2.1. He said that the responses at the Ashton to Rexburg and Heise to Shelley are the same, but changes were noted at the Shelley to near Blackfoot reach, with an increased response to stresses in the areas east of Blackfoot and around Minidoka dam. At the near Blackfoot to Neeley reach, the response to stresses in the Henry's Fork area decreased and the response to stresses near the Little Lost tributary basin increased. The responses at the Blue Lakes spring cell appeared similar, but the area where the response at the Clear Lakes spring cell is greater than 10% increased in size in ESPAM2.1.

**Item 10 -** Rick Raymondi began a discussion regarding obtaining a committee endorsement of ESPAM2.1. He reminded the committee that the Mud Lake seepage issue had been revised, and the effects of the revisions were illustrated with the curtailment scenarios and the new response functions. Chuck Brendecke said that it was right for the Department to correct the error, but he asked what the new model version meant in the context of the Rangen Delivery Call. Willem said he recommended that the Department begin using ESPAM2.1 as of today. Chuck Brockway said that the expert witness reports were due November 30<sup>th</sup>. Chuck questioned whether ESPAM2.0 would be used for the Delivery Call, or would the best available technology be used. Allan Wylie left the room to question the Director on this issue.

Willem said that in his opinion, ESPAM2.1 is ready to go as soon as the Department is ready to start using it. Greg Sullivan said that he was unwilling to pass judgment on something that the committee just received today. Chuck Brockway asked if the committee is convinced that we should be using ESPAM2.1. Allan returned and said the Director prefers to use ESPAM2.1.

Chuck Brendecke said he needed more time to make recommendations and to prepare his expert report. Greg Sullivan said the validation, response functions, all those things that could potentially be used in the hearing for the Rangen Delivery Call, need to be finished. Chuck Brockway said it would be a struggle to get all the supporting information done before the expert report deadline. He questioned whether the committee would ever make a recommendation. Chuck Brendecke said not now, and he wanted time to review the calibration materials and make some of his own runs with the new model. He went on to question if ESPAM2.1 is used, will any information developed using ESPAM2.0 be used. Chuck Brendecke also questioned if the committee is ready to say there is no difference between version 2.0 and 2.1.

Chuck Brockway asked if the differences are significant to the Rangen call, and he answered his own question replying "no". Chuck Brendecke asked if the Department

performed a sensitivity analysis, and Jennifer Sukow said no and the model had only been calibrated for two days. She said the superposition model was posted.

Willem said that due to the deadlines, it may be unfair to ask for an endorsement from those involved in the case. Mat Weaver said that a delay of the endorsement affects the Idaho Water Resource Board's decisions on managed recharge. Greg Sullivan said he wants to be convinced how changes will ripple through the springs. He said he was not as concerned about the validation runs, but he wanted to see all the curtailment runs, response functions, and uncertainty runs.

Allan proposed to perform predictive uncertainty runs by applying stress at the centroid of Water Districts 110 and 130 and assessing the response at Clear Lakes and the near Blackfoot to Neeley reach. Sean Vincent said that would be about 24 days of computational time. Greg Sullivan asked if the Department was comfortable with version 2.0 and the trim lines runs. Rick Raymondi responded that the Director wanted to move forward and use version 2.1.

Rick said that he would draft a memo to the committee outlining what the Department would do to complete the documentation on ESPAM2.1. Rick Raymondi asked Stacey Taylor how close the figures, tables, etc. are to being finished, and Stacey said by mid-December. Allan said some things would be easy and are nearly complete. Chuck Brendecke asked if the Department could prepare a master spreadsheet of response functions. Allan said he would post the spreadsheet and a shapefile.

Sean Vincent said that it will not be that significant to complete the documentation for version 2.1. Sean went on to say that he is concerned about the incremental paradigm and re-doing all the documentation for every new model version. Willem said that Sean makes a good point, and the committee should discuss what documentation is needed. Greg Sullivan said it depends on how big the change is. Willem said because we re-calculate conductance for every new version, the documentation becomes a large task. He suggested a more qualitative approach to documenting and no re-doing all the reports again. Sean said we make changes that we think are improvements.

Chuck Brendecke said the next meeting is in January, and he needs more time to review the new model. He said we should continue to correct errors when we find them and that a lot is at stake now. Willem said it doesn't look like the error comes up with dramatically different changes to the model, so that the old model was not terrible even with the error.

Chuck Brockway said that Rangen had expectations for the next growing season. Greg Sullivan said that he would like to have the memo from the Department before the next status conference.

**Item 11** – The committee agreed that the next meeting should be January 14, 2013.

**Item 12** - The ET Subcommittee began discussions, and the minutes are in the ET Subcommittee folder on the ESHMC web site.

### **DECISION POINT SUMMARY**

The following was agreed upon:

- 1) IDWR agreed to place all meeting attendance lists in a separate folder on the ESHMC web page.
- 2) IDWR agreed to provide an additional appendix to the final report that combines the PEST adjustment factors in one place.
- 3) IDWR agreed to prepare a difference map for the transmissivity of the two calibrations (ESPAM2.0 and calibration E121025A001) and a ratio map (new T/old T).
- 4) IDWR indicated that the Director wanted to move forward and use version 2.1.
- 5) IDWR agreed to draft a memo to the committee outlining what the Department would do to complete the documentation on ESPAM2.1.
- 6) IDWR agreed to prepare a master spreadsheet and a shapefile of response functions.
- 7) The committee agreed that the next meeting should be January 14, 2013.