General Comments

Most important comments by both reviewers requested more complete information on the modifications to the model, more specifics on the parameter sets used for the study, and no reliance on un-refereed articles for information. *These concerns were addressed in an expanded methods section which summarizes the changes to the model, includes parameter definitions, and describes their origins.*

Include graticles and datums : *Updated*
References are just bad - *Updated references, used vancouver style, (not els-article-num, as specified in Author Guide)*

Reviewer #3

[X] Unfortunately, the authors do not provide sufficient background information to evaluate the 3PG implementation.

Expanded Methodology Section, removed internal citations.

[X]...I have attached a marked up review file that shows some of these errors which include inaccurate facts,

Noted below

[X] The introduction does not provide the basic justification necessary….

Updated introduction with more complete description and review.

[X] The basis for coppice modifications to 3PG are described in Hart et al 2014, which appears to be a non-refereed report presented on an institutional server (the citation was incomplete).

Expanded description of coppicing section and removed references to internal paper.

[X] The parameter sets used are vague and need to be fully disclosed. Present each of the parameters that have been modified from Headlee et al values. Once tabulated, they can be compared to one another and with other 3PG parameter sets. Justify the use of so many parameter sets, and describe why these have been selected out of the full range of possibilities.

Parameter sets more fully described in the paper.

Reviewer 3 included a PDF file with a number embedded comments. These will be addressed by referencing the line number:
- [X] 51 - Fixed complicated sentence
- [x] 55 - Acknowledge and discuss other approaches to this problem (e.g. Deckmyn et al, Amichev et al.). How do their approaches differ from your's. Which one is preferable and explain why.
Updated references to relevent work

- [x] 59 - Upon what is this based? Justify the proportion of root stores using authorities showing this is accurate.
- [x] 61 - Methods These are methods, details of which don't belong in the introduction. Cite peer-reviewed authorities where validation took place.
- [x] 64 -Again, this does not belong in the introduction. It should be described in the results.
- [x] 66 Results
- [X] 88 Note about citatation
- [x] 90 Binary information
- [x] 97 - Describe these calculations. Even someone with expert knowledge could not understand and duplicate this approach.
- [x] 103 Redundant use of soil parameters in this sentence.
- [x] 109 - Modify this to something like: "... allocates biomass production from photosynthesis..." No production results directly from transpiration. This confusion between transpiration and photosynthesis also appears in the Quinn et al 2014 publication. Of course, transpiration and photosynthesis occur simultaneously when stomata are open, which might suggest transpiration drives production, but it is photosynthesis that directly assimilates the carbon used to produce biomass while water vapor is lost from the leaf through the process of transpiration.
- [x] 113 The reference presented does not meet the reference style. Include institute for which report is written, report number and URL.
- [x] 115 Redundant use in this sentence of this uncommon word. Rephrase to eliminate redundancy. I suggest using common simple synonym such as "excess"
- [x] 115 How much is used, and what is the basis for selecting that specific amount.
- [x] 116 Incomplete thought. Apparently the original model begins to supply new biomass once some level of canopy has developed.
- [x] 117 can't make sense out of this sentence.
- [x] 119 What difference? No previous mention of a difference. I guess the comparison between actual to potential is calculated as a difference?
- [x] 121 It is not apparent when in the coppice regrowth this is describing.
- [x] Figure 2. Parameters (Credit inspiration for this figure, e.g. Landsberg and Sands Fig 9.1, etc.)
- [x] 123 To say that regrowth is timed with climate is not accurate because it implies that time is controlling growth. Actually, climate is controlling growth and both climate and growth are correlated with the time of year. Causation of growth in this case is climate, not time. Very different timing of
- [x] 131 Remove
- [x] 135 This appears to result from the fact that there was a wide range of parameters from Hart et al (2014) trying to fit multiple clonal growth responses.
- [X] 137 This section is OK
- [x] 151 Sixteen ? I guess
- [x] 154 -Figure 4 shows
- [x] Figure 4 Total Annual Rainfall (precipication vs. rainfall)
- [x] 205 Poplar
- [x] 208 - Bad Reference
- [x] 212 - Figure 10 is yield for irrigated crops not some sort of masked area without high slope and salinity.
- [X] 257 spatial and Spatial
- [x] 271 Move stuff to methods
- [x] 273 Justify using deferent parameter sets. Implies uncertainty in which parameters to use. Revise sentence to eliminate "was run ... were run" confusion.
- [x] 274 Placing this statement around line 135 would help avoid the ensemble confusion. In fact, all statements in this first paragraph of the Results section belong in Methods section.

- [ ] 275 Do you mean an 18 year total lifetime?
- [ ] 283 Lines 278-279 describe expressing on "per year basis", i.e. Mg/ha/year, or NPP. But these units suggest that this is cumulative yield over 18 years. The values are too large to be expressed on a per year basis, which suggests lines 278-9 should be modified to something like cumulative annual yield. See table in the AHB overview article showing annual NPP (http://www.extension.org/pages/70456/poplar-populus-spp-trees-for-biofuel-production#.VH9_FWf-mpE)
- [x] 286 Be specific, this is not a term commonly used to describe any region of the PNW.
- [X] 305 Bad Figure reference Fixed
- [X] 131 Hart et al (2014) is a non-refereed publication that intends to describe the logic used for implementing and validating the coppice modification to 3PG. Review of that publication leaves numerous questions about the basis for the model implementation and raises concern about the accuracy of predictions due to uncertain model parameterization.

Reviewer #5

[X] To warrant publication I believe it is important to validate the model comparing their results to actual plantations and other outcomes from similar models that used 3-PG for modeling poplar.

Expanded Methodology Section, included notes on comparison to field tests.

[X] however the parameters have to be carefully derived and explained and the sub model has to be validated before it is published. It is also not clear how the parameter for the 3 PG model were derived. My specific comments are provided below:

….The parameter sets used are vague and need to be fully disclosed. Present each of the parameters that have been modified from Headlee et al values. Once tabulated, they can be compared to one another and with other 3PG parameter sets. Justify the use of so many parameter sets, and describe why these have been selected out of the full range of possibilities…

The parameter sets used have been more completely described and disclosed in the Methods section.

[X] ...However, to my disappointment, I could not see if the model has been validated to empirical data in the Pacific Northwest Region. …

The model has been validated to published coppiced field trials,though in France, not the PNW. These steps are more fully discussed in the Methodology Section.

- [x] Highlight number 2, please replace "exsiting" with existing

- [x] Page 2. Please provide a brief overview about the 3PG model, to understand how the growth is modeled and what are the main parameters? How the parameters are adjusted? What are the assumptions and simplifications of the 3PG model?

Added to Methodology Section.

- [x] Page 2, line 27. There is no validation of the 3PG model for coppiced SRWC against empirical data.

- [x] Page 3 Lines 61-62. What field studies were used to validate the 3PG model? Please cite or report the methods you used to compare the model to actual data. I think this part corresponds to the methods not the introduction.

- [ ] Page 3, line 65. I think the climate change scenario is out of the scope of this study. It is more important to validate the model first before making assumption and modeling different scenarios.

Maintained climate study

- [x] Page 4, line 85. What are the implications in relation to the model results of having such a large pixel size? I understand that having such a large pixel size reduce complexity but it is not clear (or discussed) how accuracy and quality of the results could be affected. Discuss or cite literature that had used a similar approach with good quality results.

Refered to similar studies. Since the yield predictions are based mostly on weather and the area estimates are for regional predictions. this seems reasonable.

- [x] Page 5, figure 1, I would suggest eliminating figure 1, since it adds very little to the description section.

- [ ] Page 6 line 105. How sensitive is the model to the monthly step run? Does the result from the model growth would be different if the 3PG model is run at daily or yearly timestep?

Did not include this in detail.

- [x] Page 6 line 113. There is no reference provide in cite # 8. Is that an internal report of a review from the authors? Is this report available for reader of the article?

Removed references to internal reports, added more information to paper.

- [x] Page 6 lines 117 to 122: Is there any empirical data to compared root contribution modeled against real?

Referenced gross empirical estimates of available root mass.

- [x] Page 7, figure 2. Is there any hierarchy in the graph? Some elements are not connected, so it is not clear how the different inputs are related.

- [x] Page 8, line 125. Explain when conditions are favorable and not favorable. Do favorable (and unfavorable) conditions change across the region?

- [x] Page 8, line 131. Revise cite 8.

- [x] Page 9, line 165-166 . What are the assumptions when ground stations are not available no validate the data?

- [ ] Page 10 and 11, how does pixel size of mean annual temperature and annual rainfall raster compares to the pixel size used to do the grid partitions of the region? In other words if a grid pixel contains two different rainfall pixels, what rainfall values is assumed for the grid partition?

As described, the values taken were cubic convolutions of the surrounding (8 pixels). For comparison to PRISM data, this is includes most of the overlapping pixels.

- [x] Page 9-12. I would prefer to have a table of the 3PG parameters estimates used in the model to show the value used, the units and the source.

3PG parameter included

- [ ] Page 16, line 244. I would suggest the authors to concentrate in the model validation before analyzing climate change scenarios.

Left in the Climate Change scenario

- [ ] Page 16, line 246. Explain in which consist A1B scenario or provide a citation. Is there any particular reason Why this scenario was selected?
- [ ] Page 19, line 275. I would be good to explain in the introduction how poplar is managed for liquid fuels production.

There are multiple pathways, and we did not include this in detail.

- [X] Page 22, lines 355 to 363. Conclusion section needs to be strengthened. Explain what the limitations of the model are. Also how the model is affected by the parameter and how modeled grow compares to actual growth of poplar plots.

Included in the methodology section, a comparison of model growth to field tests.