

CEE 6410 – Fall 2016  
HW 9 – Wetland Water Management  
DUE: October 13, 2016

How does the area of suitable habitat for priority bird species at the Bear River Migratory Bird Refuge change if managers are willing to tolerate 20% of 30% invasive vegetation cover in wetland units (rather the current 10%)? How should Refuge managers alter water allocations and invasive vegetation removal in Refuge wetland units?

In your 1-page write-up, give a brief overview of the Refuge model, describe the non-linearities, explain how the model data was altered to represent managers' tolerance for higher invasive vegetation cover, and compare results across the scenarios. Additionally, recommend how the model formulation could be further improved to more accurately represent interactions between invasive vegetation plant cover and evapotranspiration from wetland units.

Helpful Suggestions:

1. Use the GAMS model for the Refuge and Matlab graphical user interface (GUI) introduced in class and available for download <https://github.com/alminagorta/GUI-SWAMPS>.
2. Input data describing managers tolerance for invasive vegetation cover (habitat suitability curve for invasive vegetation) can be entered and modified in the Excel workbook BRMBR\_Input.xls on the worksheet Param\_HV.
3. The habitat suitability curve for invasive vegetation cover appears in Eq. 3 and Figure 3 in the [documentation describing the model](#).
4. The model can be run with or without the Matlab GUI. To run without the Matlab GUI, enter data in the excel file (Suggestion #2), then run the file GAMS\_code\_Excel\_input.gms.



Category (Max. Score)	No Evidence	Doesn't Meet Standard	Nearly Meets Standard	Meets Standard	Exceeds Standard	Self-Score	Instructor Score
<b>Title (1)</b>	Absent  0	Evidence of two or less  0	Evidence of three  0	Evidence of four  1	Title – can assess main point from title alone; Name, Instructors' Names, Course, Date, Neatly finished 1		
<b>Introduction (3)</b>	Absent, no evidence  0	There is no clear introduction or main topic.  1	Introduction states the main topic but either: 1. Does not give a full overview, Or: 2. Too detailed, leading to annoying repetition later. 2	The introduction states the main topic and previews the structure of the report.  2	The introduction states the main topic and previews the structure of the report. Good overview of the problem and solution approach. Gives enough detail to motivate the reader to continue reading. 3		
<b>Organization and structural development of the idea: procedure, results, conclusions (10)</b>	No content provided.  0	Paragraphs fail to develop the main idea. No section headers or guide to help the reader understand how material is organized. 1 – 5	Organization of ideas not fully developed. Paragraphs lack supporting detail sentences. No transitions and/or ineffective section headers. 6 - 7	Paragraph development present but not perfected. Each paragraph has sufficient supporting detail sentences. Few transitions. 8	Writer demonstrates logic and sequencing of ideas through well-developed section headers, paragraphs, and transitions. The first sentence of each paragraph is the summary sentence. 9 - 10		
<b>Technical Correctness (70)</b>	Questions not addressed. 3 – 42%	The writer has no clue what they are talking about. 45 – 58%	Sketchy: left out required design points. Did not work on this as much as you should have, and it shows. Many important answers are incorrect. 61 – 79%	Discussion lacks adequate detail, but all the necessary points are covered and nearly all answers are correct. 82 – 88%	Provides what was explicitly asked for. The function of each piece is demonstrated to the reader in adequate, but not overwhelming, detail. Answers are correct and reasonable. 91 – 100%		
	a) Problem and model overview (20)						
	b) Comparison of objective function, water allocations, and vegetation management for base case and scenario with increased evaporation (35)						
	c) Recommendation to improve model formation to include evapotranspiration (15)						
	d)						

e)								
Category (Max. Score)	No Evidence	Doesn't Meet Standard	Nearly Meets Standard	Meets Standard	Exceeds Standard	Self- Score	Instructor Score	
Word Usage and Format (10)	Not applicable	Numerous and distracting errors in punctuation, capitalization, spelling, sentence structure, word usage, significant figures, tables, and figures. Data vomited onto page(s). Unacceptable / unprofessional at the graduate level. 1 – 5	Misspelled words, poor English grammar and word choice. Main body of report is either longer or significantly less than one page. Figures are too small and/or under-labeled, although they are usually of acceptable quality and focus. Tables incoherent or not cohesive. Bad font sizes. Too much or too little data in appendices. Could be improved by being more meticulous. 6 - 7	Almost no errors in punctuation, capitalization, spelling, sentence structure, word usage, significant figures, and presentation of figures, tables, and appendices. Main body of report is one page or less  8	Punctuation, capitalization, spelling, sentence structure, word usage, and significant figures all correct. Main body of report is one page or less. Clear, consistent fonts. Good word processing skills. Figures have adequate contrast. Informative figure and table titles and legends. Figures have appropriate axis tick spacing, labels, units, and legends. Table columns cohesive, labeled, and specify units. Document is stapled. Appendices, if provided, are separated by topic, and each have a title, discussion, and proper formatting and display of information 9 - 10			
Conclusion (4)	Absent  0	Incomplete and/or not focused. 1	The conclusion does not adequately restate the main results. 2	The conclusion restates the main results. 3	The conclusion restates the main results, and is an effective summary. 4			
References (2)	Absent  0	Numerous errors, off-the- wall sources used. 0	Some errors in citing format; more sources should be cited. 1	Prior work cited with few errors.  2	All prior work and data sources are cited in the correct format with no errors.  2			
TOTAL (100)								