**2018 MTMW14 Project 1 marking scheme (TOT=35, bonus=3)**

Total mark: 30/35 +3 bonus

Final mark: 33/35

Implementation (13 + bonus 3) 8.5/13 + 3

1. description of numerical scheme 1 1/1
2. justification for time scheme and Δt 2 1/2

Correctly shown that scheme is stable for Δt, however could improve by calculating full range of allowed time-steps.

1. stability analysis 3 2/3

Stability analysis referenced and extended, however the analysis could be explicit and extended further.

1. clear distinction between analytical and numerical stability 2 1/2

Clear understanding that the important component is numerical stability, but failure to recognise that comparison can be made in task A because the solution is also stable analytically

1. why is this not a true implicit scheme 1 0/1

No discussion of nature of numerical scheme

1. program quality (clarity, units, etc.) 4 3.5/4

Clear, concise coding. However, some of the doc strings are a bit long (you could define parameters in the parameter file rather than the input to functions…).

1. bonus for iPython Notebook 3 +3

Task A (2) 2/2

1. Results showing stability in neutral case 2 2/2

Task B (2) 2/2

1. Decaying/growing regime 1 1/1
2. Comparison with other task(s) 1 1/1

Task C (2) 2/2

1. Non-linearity and interpretation 1 1/1
2. Comparison with other task(s) 1 1/1

Task D (2) 1.5/2

1. Annual cycle and interpretation 1 1/1
2. Comparison with other task(s) 1 0.5/1

To gain full makes it would be good to compare to task B /C and note that you have periods in the growing regime and periods in the decaying regime.

Task E (2) 2/2

1. Wind stress implementation 1 1/1
2. Discussion and interpretation 1 1/1

Task F (7) 7/7

1. Ensemble implementation 3 3/3
2. Interpretation of growth of ICs 2 2/2
3. Discussion of apparently chaotic behaviour 2 2/2

Thorough exploration of impact of initial condition uncertainty on results and a thorough discussion on whether the model can effectively represent chaos.

Scientific presentation (5) 5/5

1. Interpretation and Discussion 3 3/3
2. Quality/consistency of eqns., plots, etc. 2 2/2

Thorough interpretation and discussion of results and plots and equations well presented.