

## Homework–Module 2

Name:

- 1) The length of day has steadily increased throughout earth's history. Geological evidence<sup>123</sup> suggests that the length of day was  $21.9 \pm 0.4$  hours 620 million years ago (Mya) and  $18.7 \pm 0.25$  hours billion years ago (Gya). In other words, the rotation rate of Earth was about 10% faster 620 Mya and 28% faster 1.4 Gya. If we assume the earth's atmosphere had same horizontal pressure distribution then as it does now (which it did not and will overlook for this question), what changes in the geostrophic wind speeds (faster or slower) would you expect relative to today's conditions over the middle latitudes? Explain your answer using concepts of module 2. (Hint: consider how the Coriolis force changes with the earth's rotation rate.)

There is a 600-character limit for all questions.

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<sup>1</sup> <https://www.scientificamerican.com/article/earth-rotation-summer-solstice/>

<sup>2</sup> <http://adsabs.harvard.edu/abs/2000RvGeo..38...37W>

<sup>3</sup> <http://www.pnas.org/content/early/2018/05/30/1717689115>