



Nº da inscrição:

MINISTÉRIO DA EDUCAÇÃO
Universidade Federal de Ouro Preto
Programa de Pós-Graduação em Engenharia Ambiental – PROAMB



Prova de proficiência em Língua Inglesa Seleção Doutorado - 23/11/2015

Instruções aos candidatos:

(1) Preencher somente o número de inscrição em todas as folhas.

Part 1 (50%) – Read the text below and then answer, in Portuguese, the questions that follow.

Scientists Study Links Between Climate Change and Extreme Weather

By John Schwartznov – The New York Times - November 5, 2015

Did climate change cause that heat wave? That hurricane? That drought? A new collection of studies examined extreme weather events last year, including drought, floods and storms, to look for signs that climate change was a cause or contributor — and found mixed results. The papers are part of a broader effort to recognize the effects of climate change as the world warms, and to tease out those factors from other possible causes of extreme events.

Climate change is often discussed in terms of predictions about what may happen in the next 100 years or more as average global temperatures rise. But an emerging field of science is dedicated to discerning whether climate change is already having effects, and what they might be. The set of 32 studies published Thursday examined 28 extreme weather events in 2014; it is the fourth in a series of annual reports, and appears in The Bulletin of the American Meteorological Society.

“The studies this year are pretty evenly split, about 50/50, for those that did and did not find a role for climate change in the event’s likelihood or intensity,” said Stephanie Herring, lead editor of the report and a National Oceanic and Atmospheric Administration climate scientist, in a news conference. “The strength of the climate change signals that we see really varies based on the type of event being looked at.” The papers suggest that “human-caused climate change greatly increased the likelihood and intensity of heat waves” in some regions, including Argentina, Europe, China, the Korean Peninsula, Australia, and the northern Atlantic and Pacific Oceans. The researchers also say that climate change probably had a role in the unusually large number of tropical cyclones that hit Hawaii last year. The scientists, however, did not discern the influence of climate change in every event, nor did they see it playing a consistent role in certain types of events, like drought. According to the papers, which run to nearly 200 pages altogether, some droughts appeared to have more to do with population growth and government policies than rising levels of carbon dioxide and its effects. The researchers, however, did conclude that the Syrian drought was made worse by a lack of rainfall linked to climate change.

No strong link was established between climate change and the wildfires last year in the American West, or to the unusually tough Midwestern winter, which was tied more strongly to a pattern of unusual winds in the tropical Pacific. The authors added, however, that even where no link to climate change was detected, “The failure to find a human fingerprint could be due to insufficient data or poor models.” The authors emphasized that they were not describing direct cause and effect, but an analysis of probabilities based on computer models and other factors. The analysis by Dr. Murakami and colleagues took into account many factors, including natural variability and phenomena like El Niño, that play roles in hurricane formation. But the “signal” of human-caused climate change was clearly present in the models, he said, so “we still see that global warming increased the probability of tropical cyclones in Hawaii.”

The meteorological society reports do not sit well with some climate scientists who remain wary of the focus on tying climate change to specific events rather than taking a broader view. Michael E. Mann, a climate expert at Pennsylvania State University, said the current level of warming of about 1.5 degrees Fahrenheit around the globe (and somewhat more over North America and the Arctic) “has fundamentally influenced all meteorological events,” not just those that get written up in a study. Dr. Mann said the work and the debate about it were useful. “If anything, this particular debate underscores that the question is no longer whether there is an influence of climate change on extreme weather events. The debate is simply over the magnitude and extent of that influence.”

Questions:

- a) According to the text, are extreme events always caused by climate change? Justify your answer.
- b) Cite two examples given in the text that shows the influence of climate change on weather events?
- c) Where the ‘studies’ referred to by the climate scientist Stephanie Herring in the phrase “The studies this year are pretty evenly split...” were published?
- d) Why are some climate scientists skeptical about meteorological reports?



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Part 2 (50%) – Translate into Portuguese the following abstract, which is part of the paper “Correlation Between Entrance Velocities, Increase in Local Hydraulic Resistances and Redox Potential of Alluvial Groundwater Sources” by Dimkić, M. A. & Pušić, M., published in the *Water Research and Management*, Volume 44, No. 4, Pages 3–23, 2014.

Abstract: Water well capacity decreases under certain conditions. This is a result of already extensively-researched mechanical clogging, but also of chemical and biochemical clogging (biofouling). In alluvial environments, deposits of trivalent iron and carbonates are often formed on well screens and in the near-well region, which increase the local hydraulic resistance (LHR) of the well. Research conducted on several locations in Serbia has shown that the LHR increase, of a biochemical nature, largely depends on the oxic state of the aquifer and groundwater. A correlation was established between LHR increase, iron concentration and redox potential of groundwater. Based on a pre-defined well clogging rate, the correlation between the groundwater redox potential, iron concentration and allowable (critical) entrance velocity to the well was quantified. It was concluded that under certain conditions it is necessary to tighten the allowable entrance velocity criterion which ensures the aquifer's filtration stability. This considerably decelerates the LHR increase, or well ageing, and is reflected in the nature of well maintenance.



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