Levels of Reality in Weather Forecasting: the Lesson by Richardson and Von Neumann

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At first glance weather forecasting appears just a topic of practical relevance. An analysis of its main aspects shows the presence of conceptual topics which are rather interesting in complex systems:
a) limits of extreme reductionism;
b) limits of naive inductivism;
c) relevance of old (apparently very far) classical issues;
d) role of models at different scales;
e) importance of the proper level of description.

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[1] A. Dahan- Dalmedico History and Epistemology of Models: Meteorology as a Case Study Archive for History of Exact Sciences **55**, 395 (2001).

[2] P. Lynch The Emergence of Numerical Weather Prediction: Richardson's Dream (Cambridge University Press, 2006)

[3] S. Chibbaro, L. Rondoni and Vulpiani Reductionism, Emergence and Levels of Reality (Springer-Verlag, 2014)