

PROJECT 2.2: TROPICAL CYCLONES IN THE NORTH-WEST

Principal Investigators

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Ms Anne Leroy, Employed on the IOCI project as a consultant on Intraseasonal Forecasting of tropical cyclone activity. Météo France, Nouméa, New Caledonia

Milestone 2.2.1: Research paper submitted on the climatology and interannual variability of tropical cyclones in the Indian Ocean that affect the Western Australian coastline

Completed 31/12/2009

This milestone has been completed and was reported on in the IOCI3 Report 1.

Milestone 2.2.2: A statistical forecast model for tropical cyclone activity along the Western Australian coastline (2-week lead time)

Completed 31/12/2009

This milestone has been completed and was reported on in the IOCI3 Report 1.

Milestone 2.2.3: Research paper on theoretical framework for understanding interannual variability of tropical cyclone behaviour in the southern Indian Ocean.

Completed 31/12/2010

This milestone has been completed and was reported on in the IOCI3 Reports 2 and 3.

Milestone 2.2.4 Report on extreme tropical cyclone behaviour in Western Australia and their economic impacts

Completed 30/04/2012

This milestone was partly reported on in the IOCI3 Report 3. A very comprehensive report has been completed and internally reviewed covering extreme tropical cyclone behaviour and their economic impacts, and also addresses some of the issues regarding the impact of climate change. The report entitled "The Economic Impact of Tropical cyclones on Western Australia" is attached to this report.

Milestone 2.2.5 State of Knowledge Report on tropical cyclone dynamics, databases and current practices relevant to Western Australia

Completed 31/12/2011

This milestone has been completed and was reported on in the IOCI3 Report 3.

Milestone 2.2.6 Dependent on the research outcomes of the first two years, a series of expert statements, updates and research papers on the vulnerability of WA to changes in tropical cyclone activity under climate change

Completed 30/04/2012

The research undertaken in this project has been documented in six peer-reviewed research publications in international journals, and in previous IOCI3 Reports. The very comprehensive report "The Economic Impact of Tropical cyclones on Western Australia" (see attachment) is a good synthesis of the current understanding of tropical cyclones over WA, including the vulnerability of WA under climate change. A pamphlet highlighting the information contained in this research project is currently in preparation.

List of publications

Knutson, Thomas R., J McBride, J Chan, K A Emanuel, G Holland, C Landsea, Isaac Held, J Kossin, A K Srivastava, and M Sugi, March 2010: Tropical

- cyclones and climate change. *Nature Geoscience*, 3, doi:doi:10.1038/ngeo779.(multi-institution paper: McBride and Ramsay contributions funded by IOCI)
- Kuleshov, Y., R. Fawcett, L. Qi, B. Trewin, D. Jones, J. McBride and H. Ramsay: 2010a: Trends in tropical cyclones in the South Indian Ocean and the South Pacific Ocean. *J. Geophys. Res.* 115, D1, D01101, 0148-0227 (Paper with members of the Bureau of Meteorology National Climate Centre. McBride and Ramsay contributions funded by IOCI)
- Kuleshov, Y., L. Qi, D. Jones, R. Fawcett, F. Chane-Ming, J. McBride and H. Ramsay, 2010b: On Developing a Tropical Cyclone Archive and Climatology for the South Indian and South Pacific Oceans. In, *Indian Ocean Tropical Cyclones and Climate Change*, 4, 189-197, DOI: 10.1007/978-90-481-3109-9_23 Springer, Netherlands. Indian Ocean and the South Pacific Ocean. *J. Geophys. Res.* 115, D1, D01101, 0148-0227 (Paper with members of the Bureau of Meteorology National Climate Centre. McBride and Ramsay contributions funded by IOCI).
- Dare, R.A. and J.L. McBride, 2011a Sea Surface Temperature response to tropical cyclones. *Monthly Weather Review*, 139, 3798-3808.
- Dare, R.A. and J.L. McBride, 2011b. The threshold Sea Surface Temperature Condition for Tropical Cyclogenesis. *J. Clim.*, 24, 4570-4576.
- McBride, J.L, H.A. Ramsay and M. B. Richman. Trend Analyses of Globally Consistent satellite-based estimates of tropical cyclone intensity. Submitted to Geophysical research Letters (Fully funded by IOCI). Submitted during 2011
- Dare, R.A., N.E. Davidson and J.L. McBride, 2012. Tropical Cyclone Contribution to Rainfall over Australia. *Monthly Weather Review*. In press.

IOCI 3 Milestone Status Report

Theme and Project Number: 2.2

Principal Investigator(s): J.McBride

Milestone description	Target completion date	Progress against milestone (1- 3 dot points)	Recommended changes to research plan (1- 3 dot points)
2.2.1 research paper on climatology and inter-annual variability	Dec 2009	completed	None
2.2.2 Intra seasonal forecast model	Dec 2009	completed	None
2.2.4 Report on extreme Indian Ocean TC's	Dec 2010	Completed 30/04/2012	None
2.2.5 Report on current practices and impacts on WA	Dec 2010	Completed but varied.	None
2.2.6 Summary and synthesis report	Dec 2011	Completed 30/04/2012.	None