



IMILAST

Intercomparison of Mid-latitude Storm diagnostics

A project overview

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M. Inatsu, J. Pinto, G. Leckebusch, U. Ulbrich
and the IMILAST team**



Contents

- **Background (why such a project?)**
- **Aims of the project**
- **First results (intercomparison)**
- **Next steps**

Project members

Project team:

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G. Leckebusch, F-Univ. Berlin/GER
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M. Akperov, RAS Moscow/RUS

Executive committee:

U. Neu, ProClim, Bern/SUI (project coordination; sponsored by Swiss Re)
X.L. Wang, U. Ulbrich, G. Leckebusch, C. Raible



Background

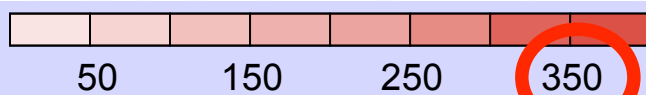
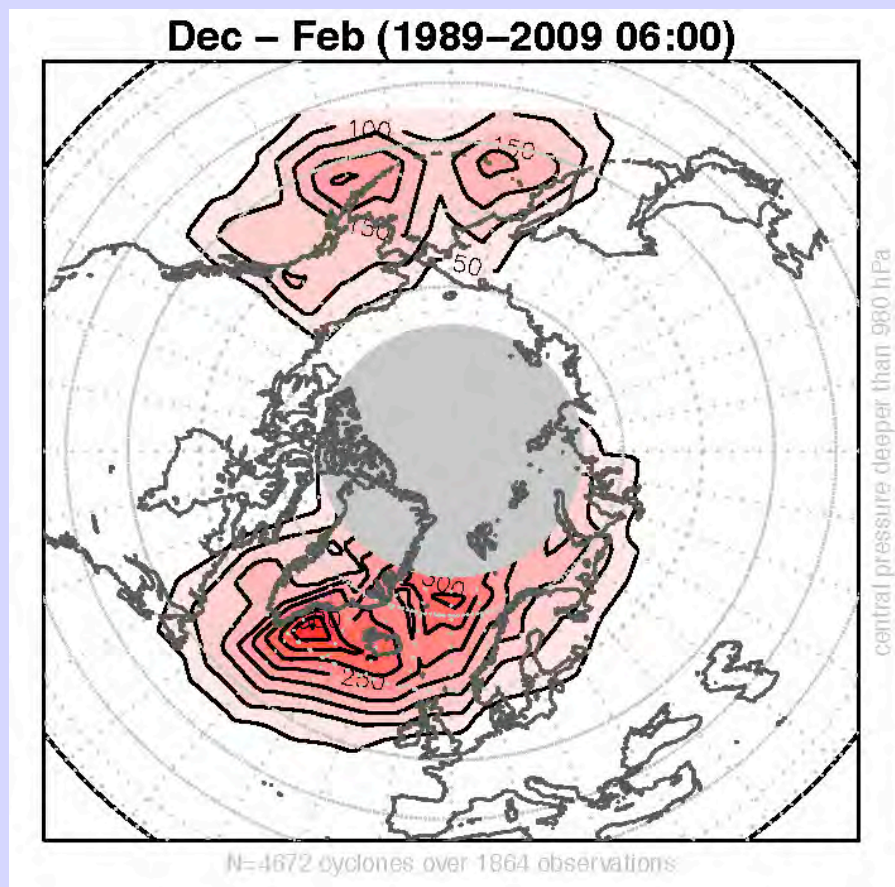
What is the project about?

- Knowledge of future **changes in** extratropical cyclone **frequency, intensity, life time, and track locations** is crucial for strategic planning and minimization of disaster impacts
- Characteristics of cyclone activity and quantification of trends strongly **depend on the methodologies** used for storm track detection
- **Knowledge about advantages and restrictions of different schemes** must be obtained to be able to provide a synthesis of results and proper interpretations

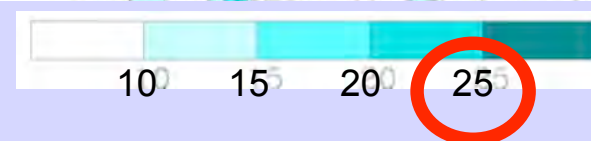
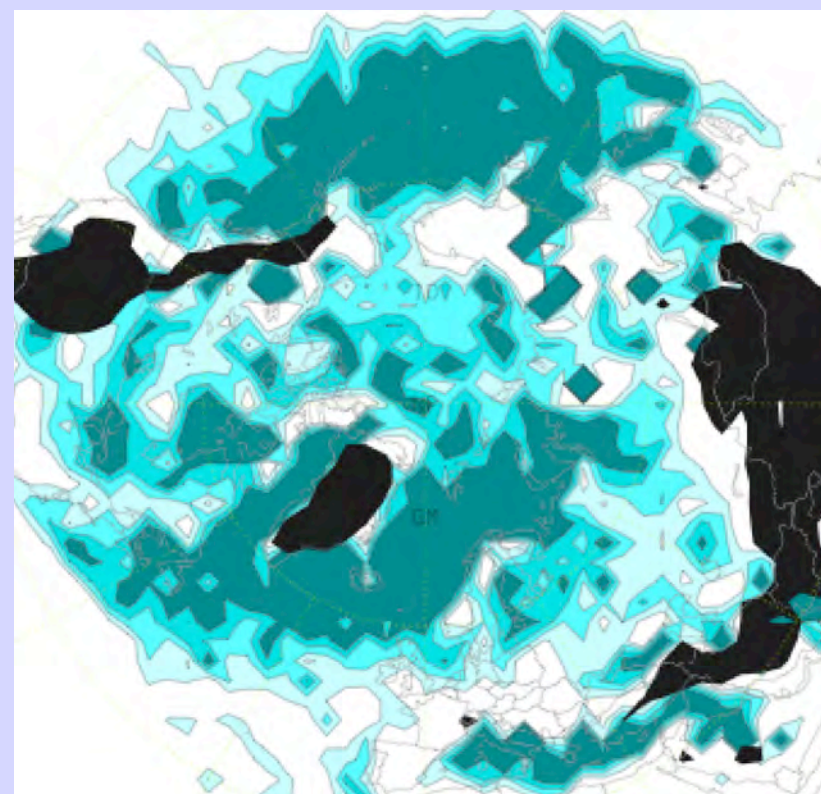


The problem...

The same illustration (storm counts), different methods...



Benestad and Chen



Wang et al., Serreze et al.



The problem...

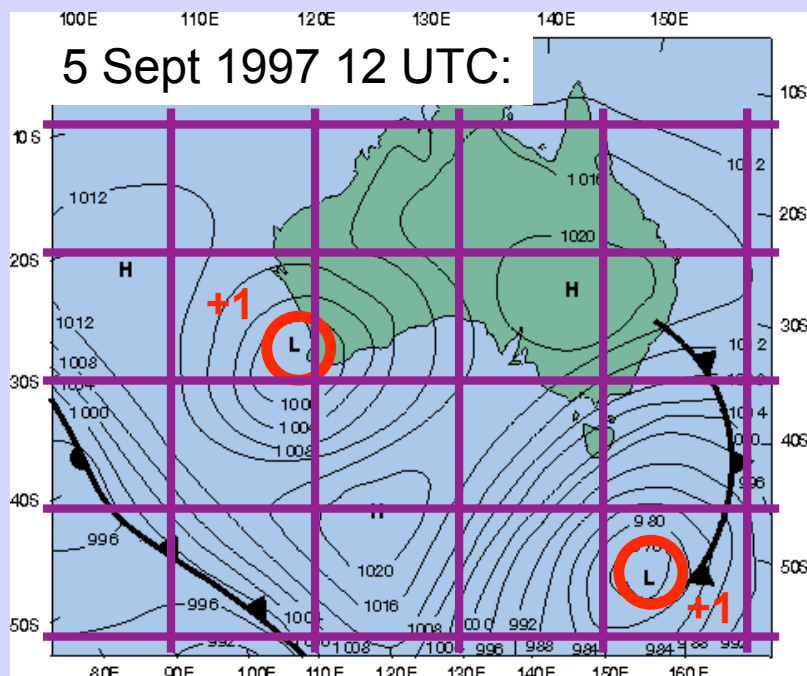
One particular problem: **How do we *count* storms?**

Examples:

A:

- treat each time step separately;
- count 1 at every grid point that contains a cyclone

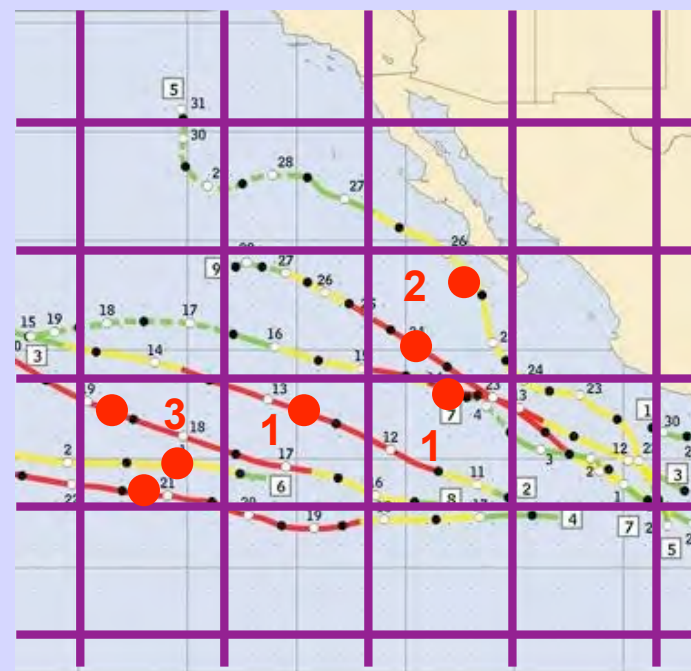
⇒ same storm may be counted several times over life time (once for each time step)



B:

- identify cyclone tracks
- Assign a grid point to this track
- Count 1 at that grid point

⇒ same storm is counted once over life time





Aims of the project

- to provide an **assessment of different methodologies**, for both cyclone identification and cyclone tracking
- to intercompare the metrics of mid latitudinal cyclone activity (identification/tracking) used for different purposes
- to point out the specific informations that can be drawn from specific methods



What did we do?

- Collect the existing identification and tracking methods (March 2009)
- Define a standard intercomparison experiment (specific data sets, list of characteristics to be delivered) (April 2009 at EGU)
- Start the intercomparison project (Summer 2009)



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First results

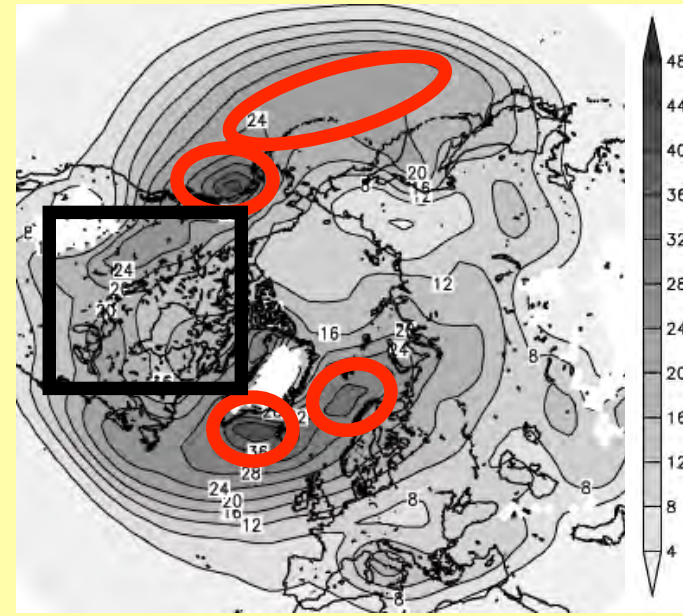
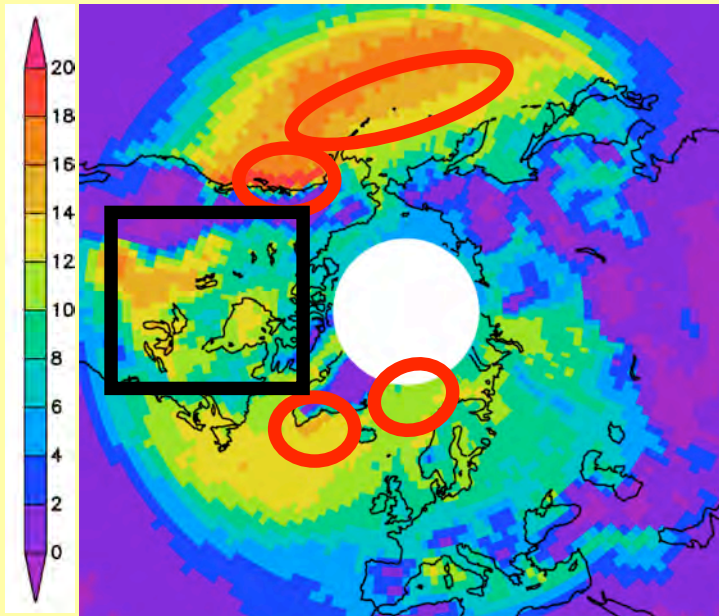
DJF cyclone counts
1989-2009

sc | nat

ProClim

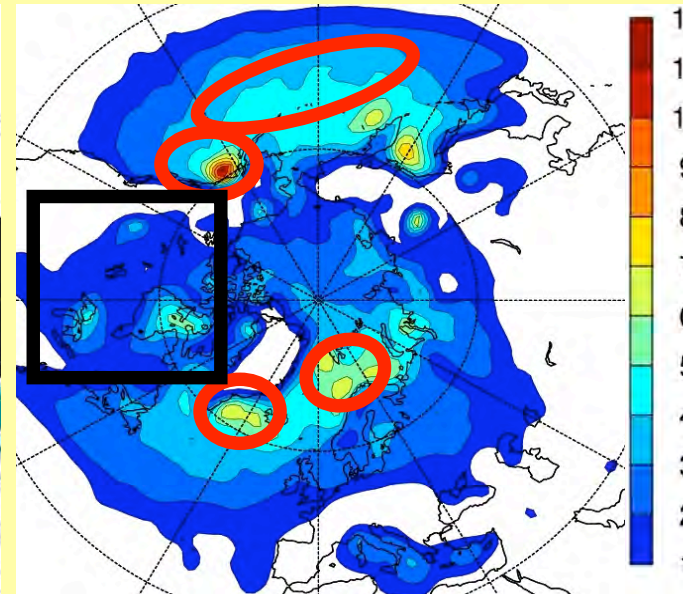
Climate and Global Change
Leibniz Academy of Sciences

Inatsu et al.



Pinto,
Leckebusch,
Ulbrich et al.

Wang et al.,
Serreze et al.

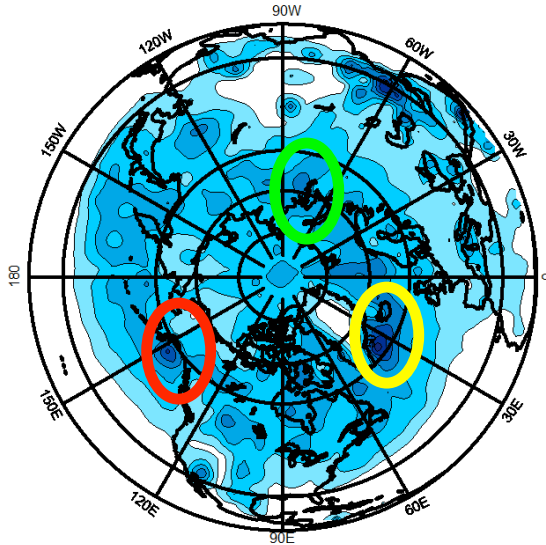


Keay and
Simmonds

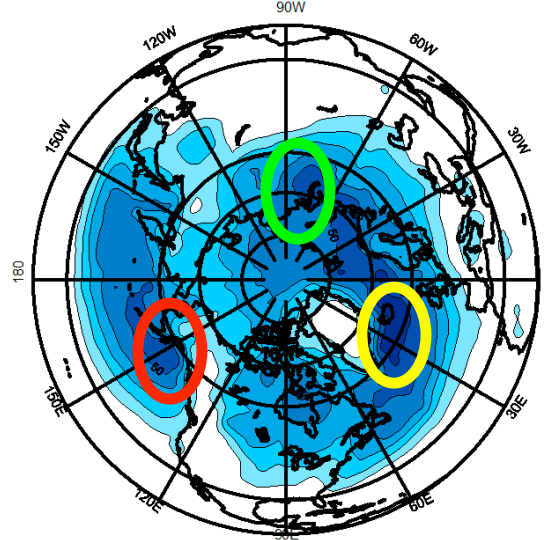
IMILAST: Comparison of cyclone tracking methodologies

Climatologies of the number of cyclones per year over the Northern Hemisphere

M09 Wang-Serreze

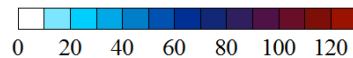


M10 Uni-Melbourne

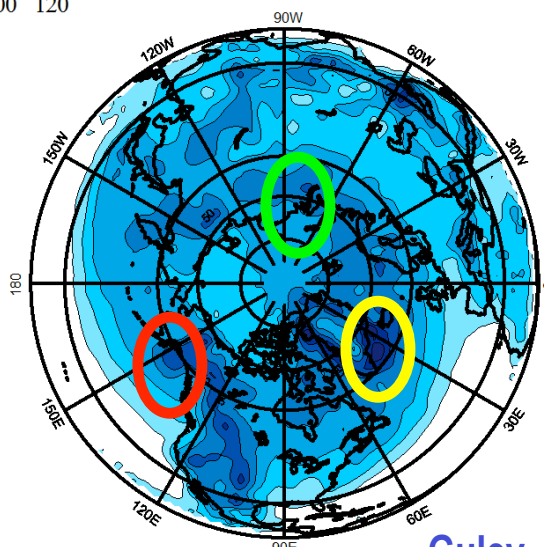
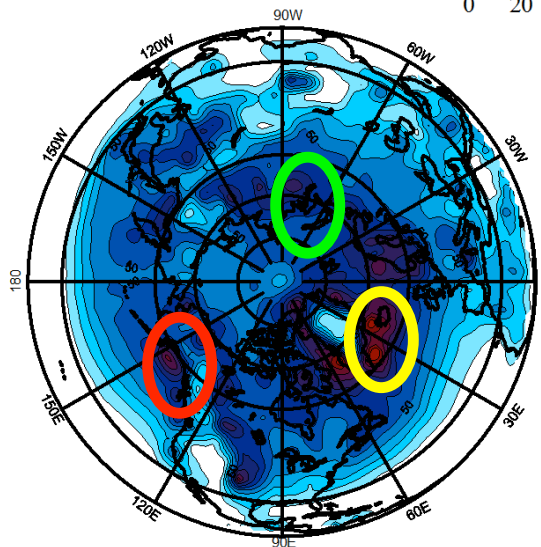


The location of storm tracks in both NA and NP is identified well in all sub-sets

M21



M12 SAIL/IORAS



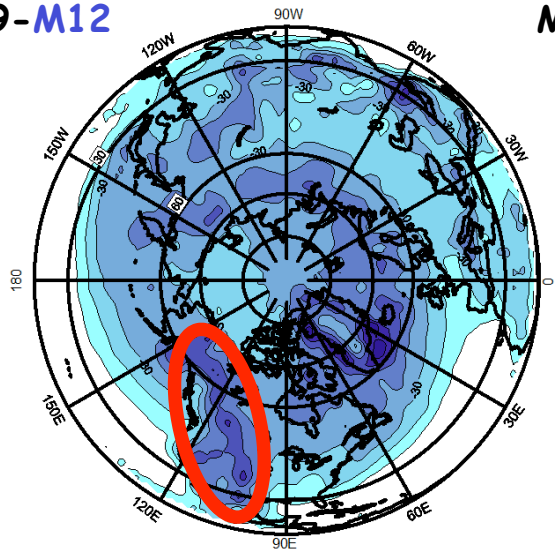
Local maxima of cyclone numbers are more or less co-located in all sub-sets

Quantitative differences are large

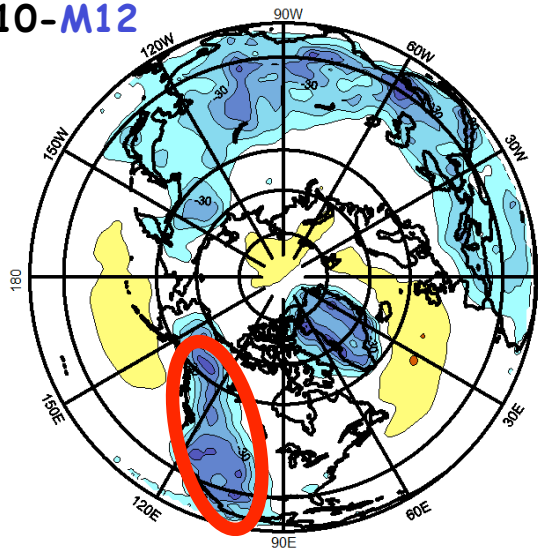
IMILAST: Comparison of cyclone tracking methodologies

Differences in cyclone numbers over the NH from different datasets (w.r.t. SAIL/M12)

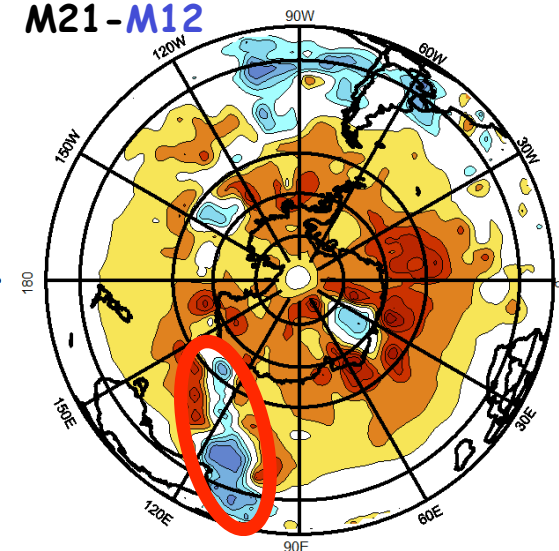
M09-M12



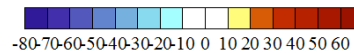
M10-M12



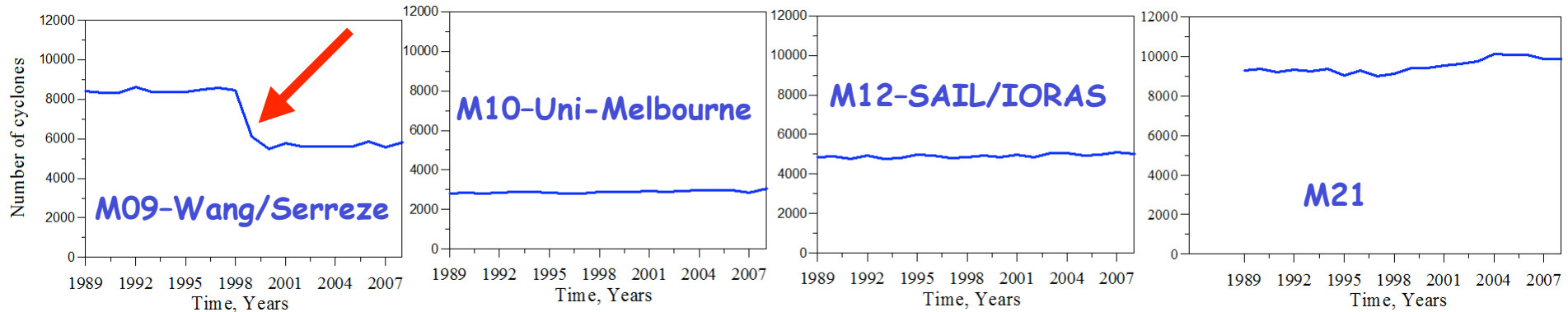
M21-M12



Only the differences which are significant at 95 % level are shown



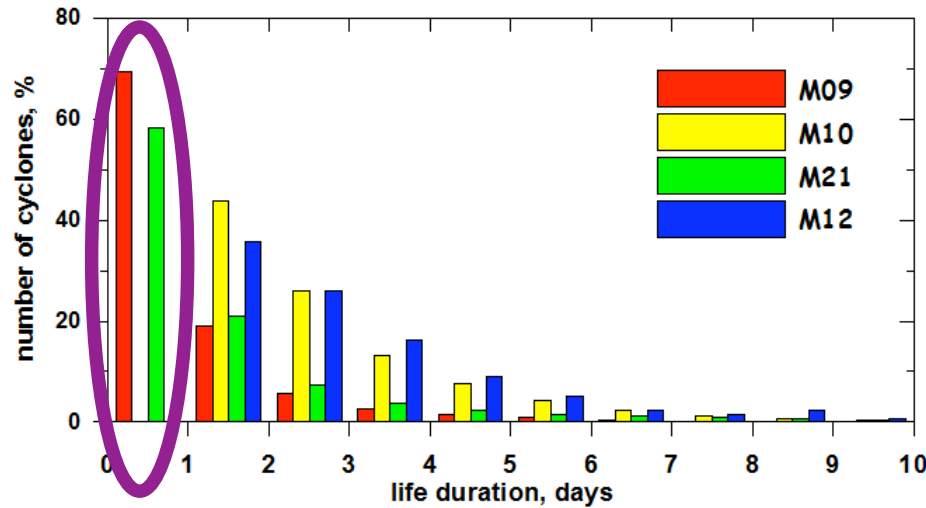
Total number of cyclones per year over the Northern Hemisphere



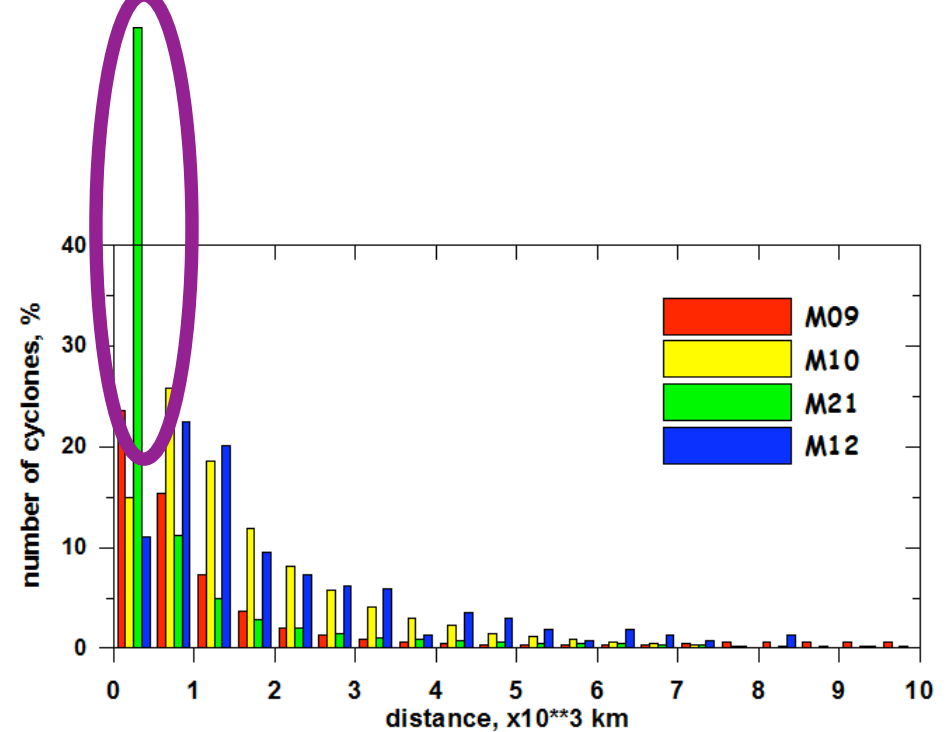
IMILAST - Comparison of cyclone tracking methodologies

PDFs of cyclone life cycle characteristics over the Northern Hemisphere

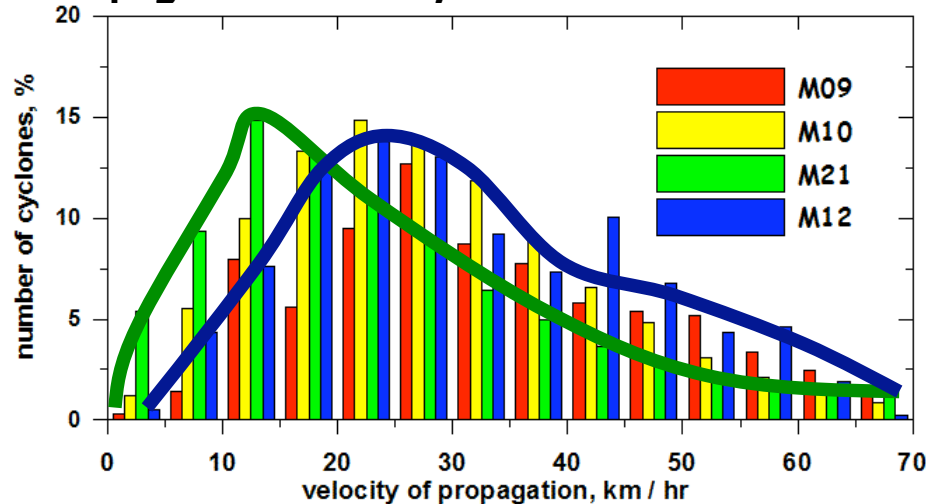
Life duration



Distance travelled



Propagation velocity



MAX distance in M09 200 000 km
M21 770 000 km

M12 and M10 (SAIL and Uni-Melb) show more comparability with each other for most parameters



Next steps

- Collect the existing identification and tracking methods (March 2009)
- Session at EGU meeting with presentations of suggestions concerning the intercomparison experiment, ev. credibility tests
- Define a standard intercomparison experiments (specific data sets, list of characteristics to be delivered)
- Set up a project data server and allocate data sets for the intercomparison experiments and output of the experiments (June 2009)
- Small intercomparison project (started summer 2009)
- Collection of results / analysis work
- Preparation of draft report (autumn/winter 2010)
- Collect propositions concerning standard definitions
- Review of draft report
- Follow-up workshop if necessary
- Preparation of Final Report

<http://www.proclim.ch/IMILAST/index.html>