Strategies for Verifying Cloud Forecasts Over the Globe

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1. The challenge

How to verify global cloud forecasts when three-dimensional "truth" is elusive?

2. Cloud verification approach

- Use multiple datasets as possible "truths" to incorporate observation error uncertainty into cloud verification
- Look for consistency among datasets to increase confidence
- Use neighborhood and object-based approaches to de-emphasize differences like cloud edges and focus on larger features
- Employ the Model Evaluation Tools (MET) software

Variables of interest
- Total cloud fraction
- Cloud layering
- Cloud top and base height
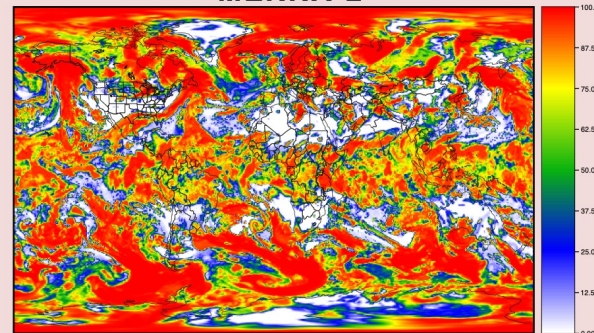- Cloud phase
- Cloud optical depth

3. Datasets

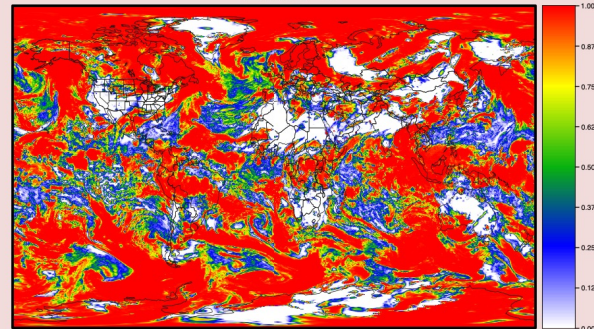| SATCORPS	ERA-5	MERRA-2	EPIC
60°S – 60°N	Global	Global	Sunlit portion of Earth
0.25° x 0.3125°	30 km	0.5° x 0.625°	8 km at nadir
Composite of geostationary satellites	Reanalysis	Reanalysis	Deep space snapshot

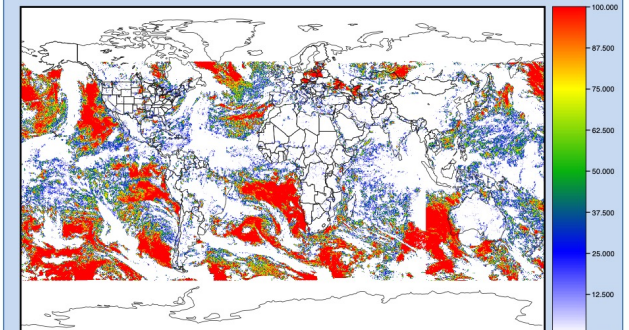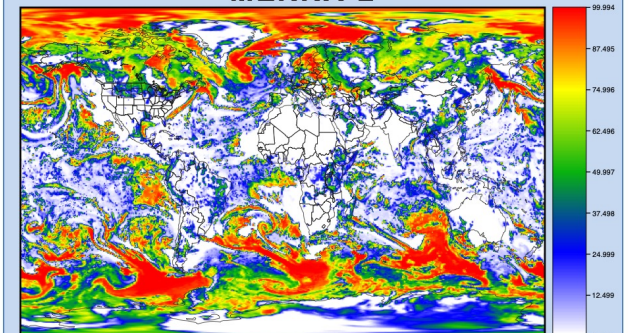## 4. Total cloud fraction

SATCORPS
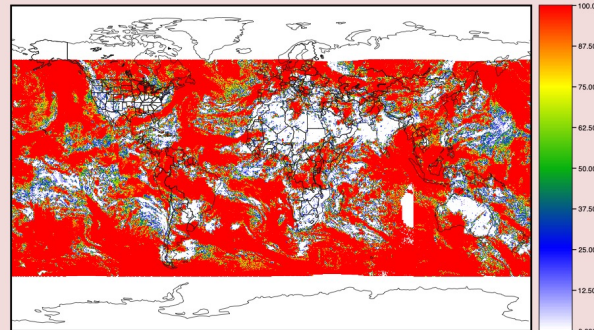
MERRA-2

ERA-5

5. Low cloud fraction

SATCORPS

MERRA-2

ERA-5