# HALO: Using CM SAF's MAGICSOL method to retrieve global and direct surface radiation from historical geosynchronous observations

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**H**istorical solar
**A**nalysis from
**L**ong-term geosynchronous
**O**rbit

# Proof of concept for a global solar ECV data set

# Global solar data sets: Requirements



Essential climate variables:

- Relevant base variable
- Long-term record
- High quality measurements

# Global solar data sets: Available data



Comparable data sets:

- Helio-Clim
- ERA-Interim
- GEWEX SRB
- ISCCP FD
- FLASHFlux
- CLARA

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Data needed with:

- Robust data requirements
- Long time series available
- High resolution
- Differentiation in diffuse/beam radiation
- Global spatial extent
- Free to use/distribute

# Global solar data sets: MAGICSOL



Advantages:

- Robust and well tested
- Low data requirements
- Self-calibration – high data availability
- Computation of direct and diffuse radiation
- Relatively low computational costs
- Best validation among comparable data sets
- Open source – verifiable, modifiable, freely usable

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# HALO:
# Spatial coverage

*Source: Météo-France 2009, composite by author*

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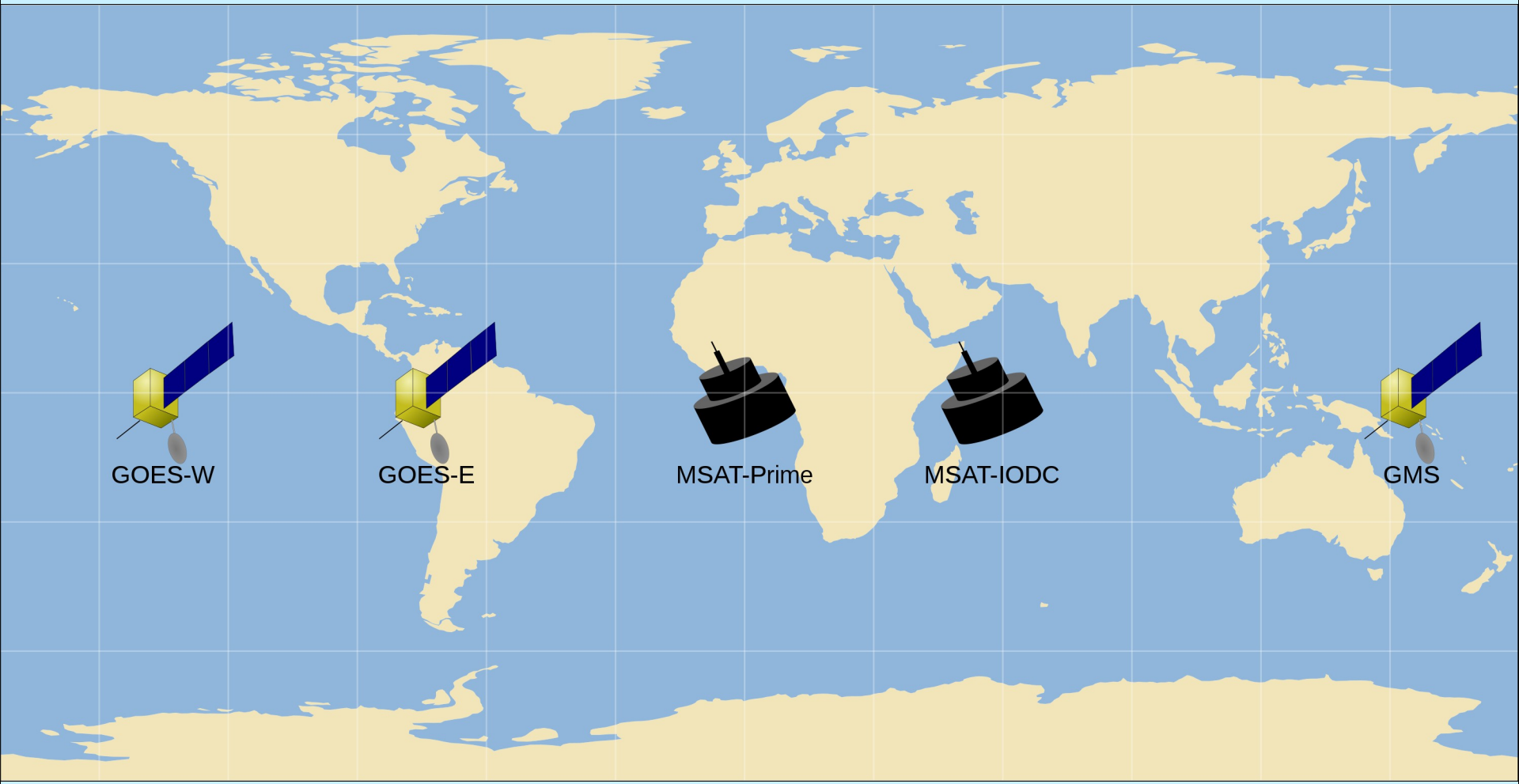
# Spatial coverage




*Source: NOAA 2012, EUMETSAT 2012, map by author*

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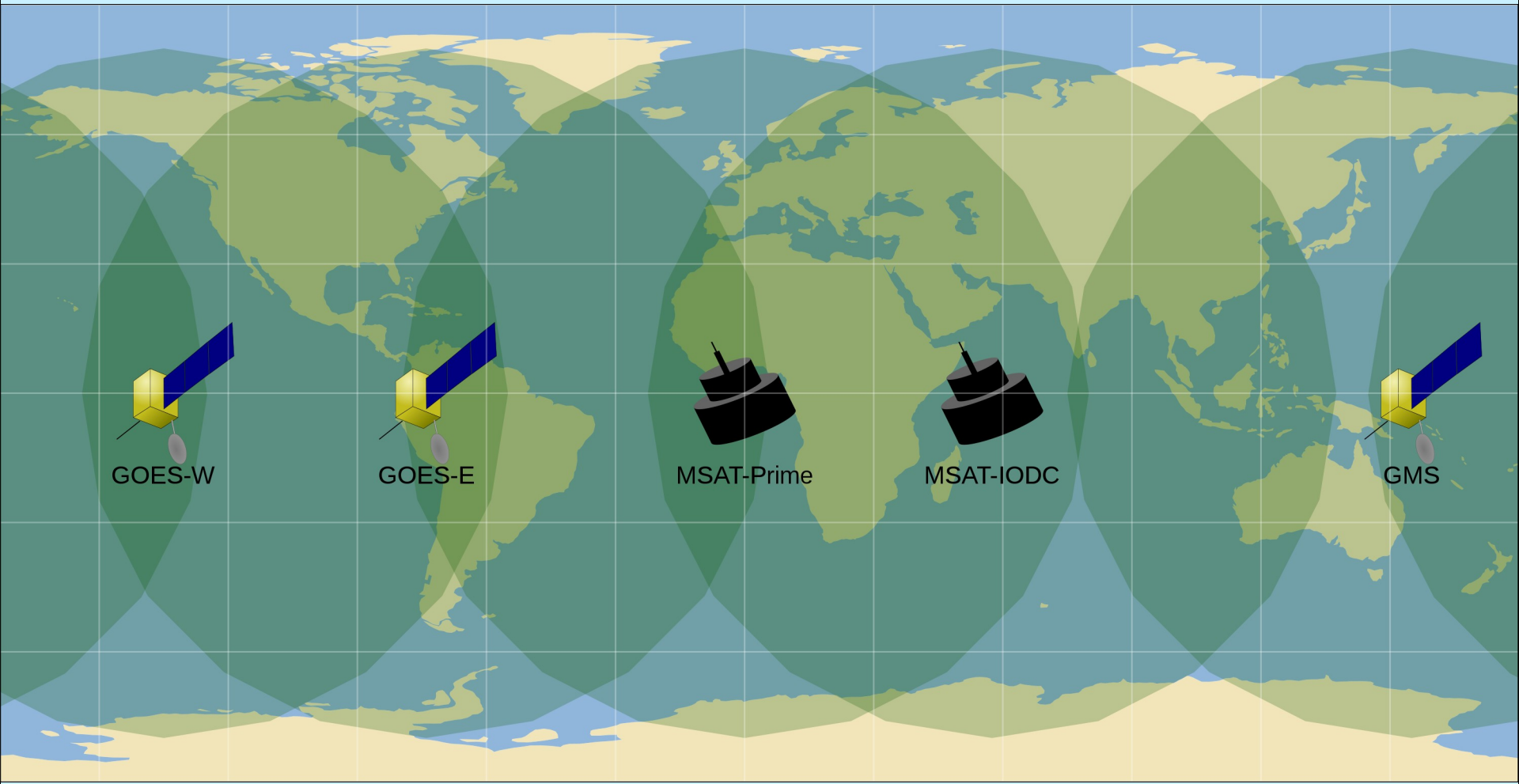


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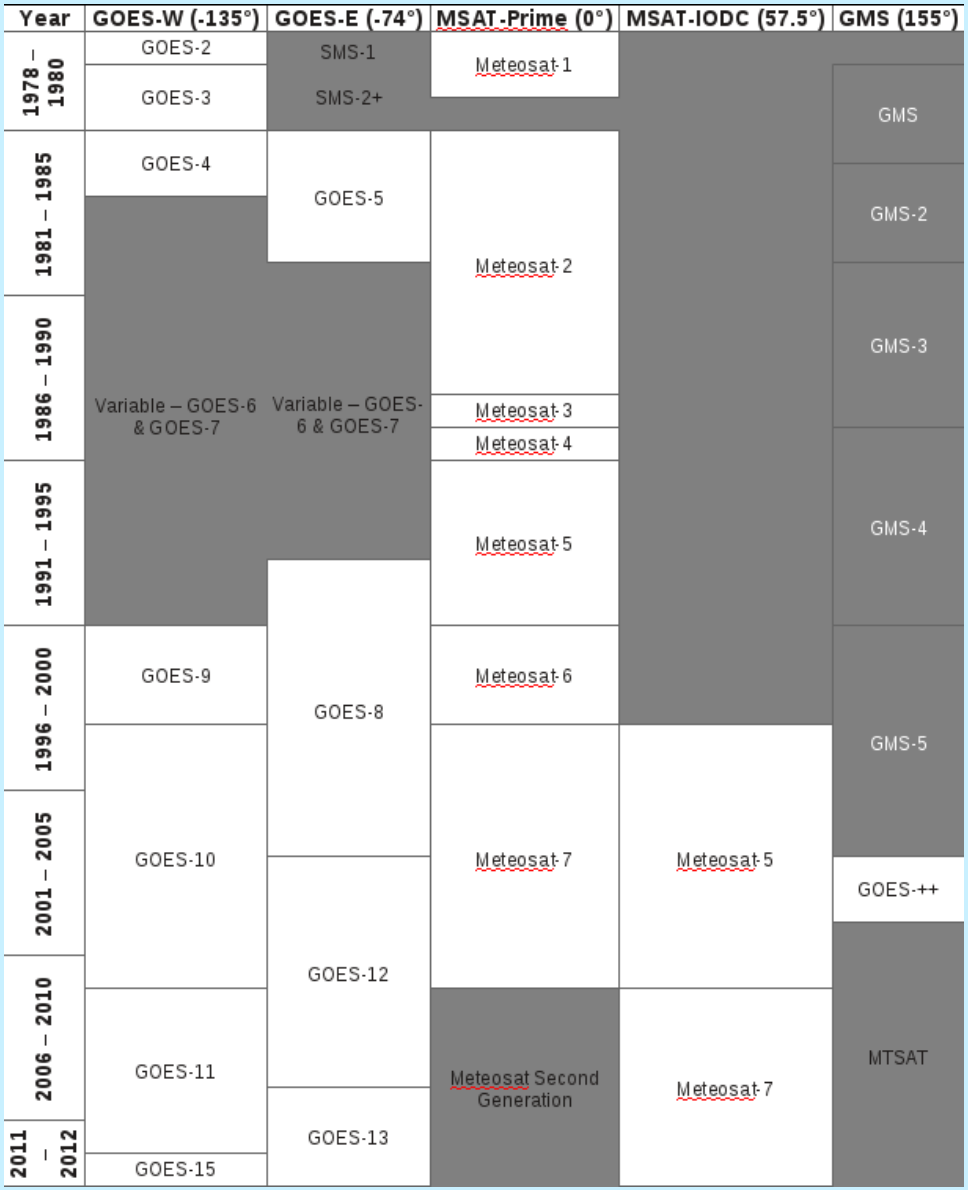


*Source: NOAA 2012, EUMETSAT 2012, JMA 2012, diagram by author*

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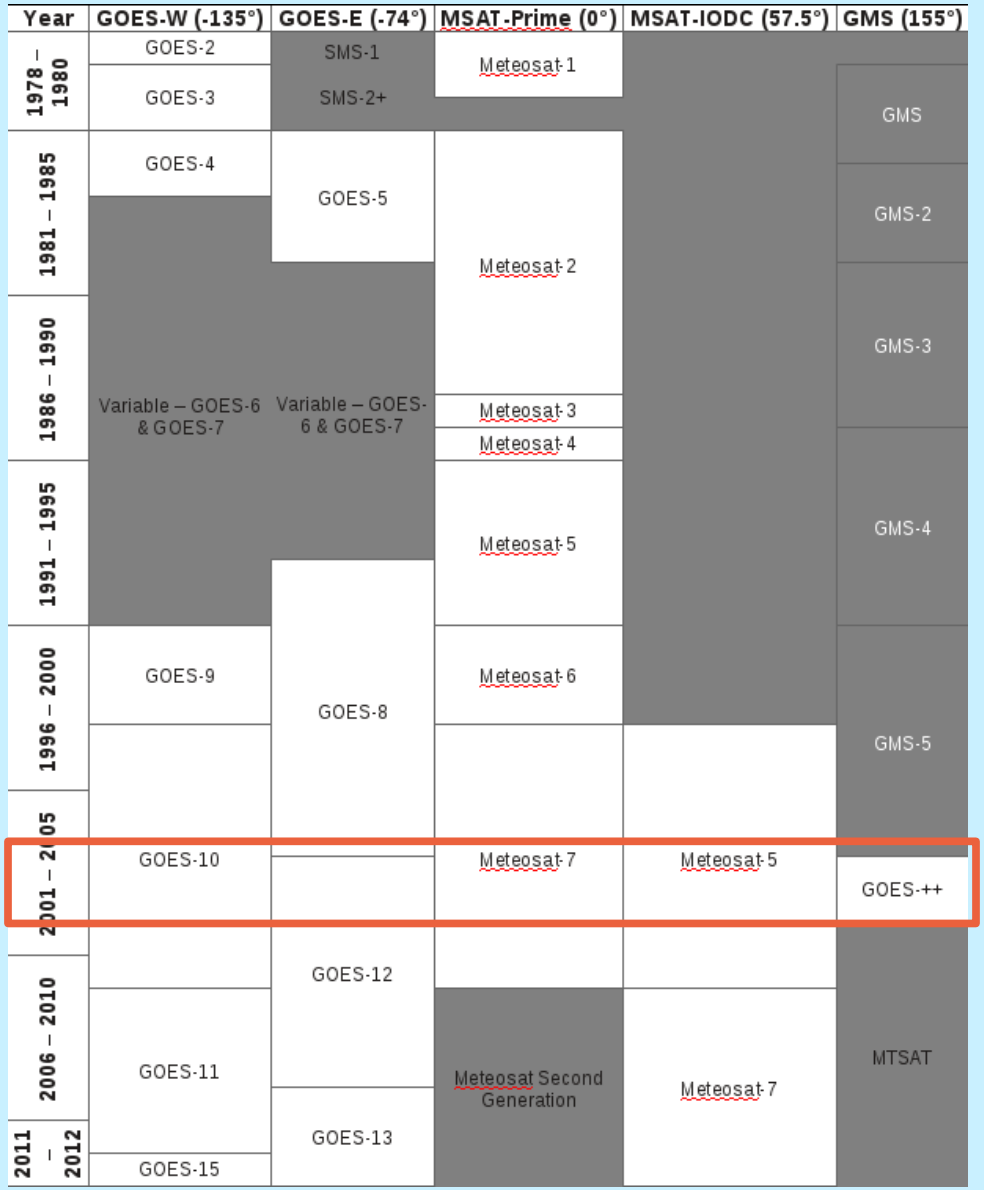


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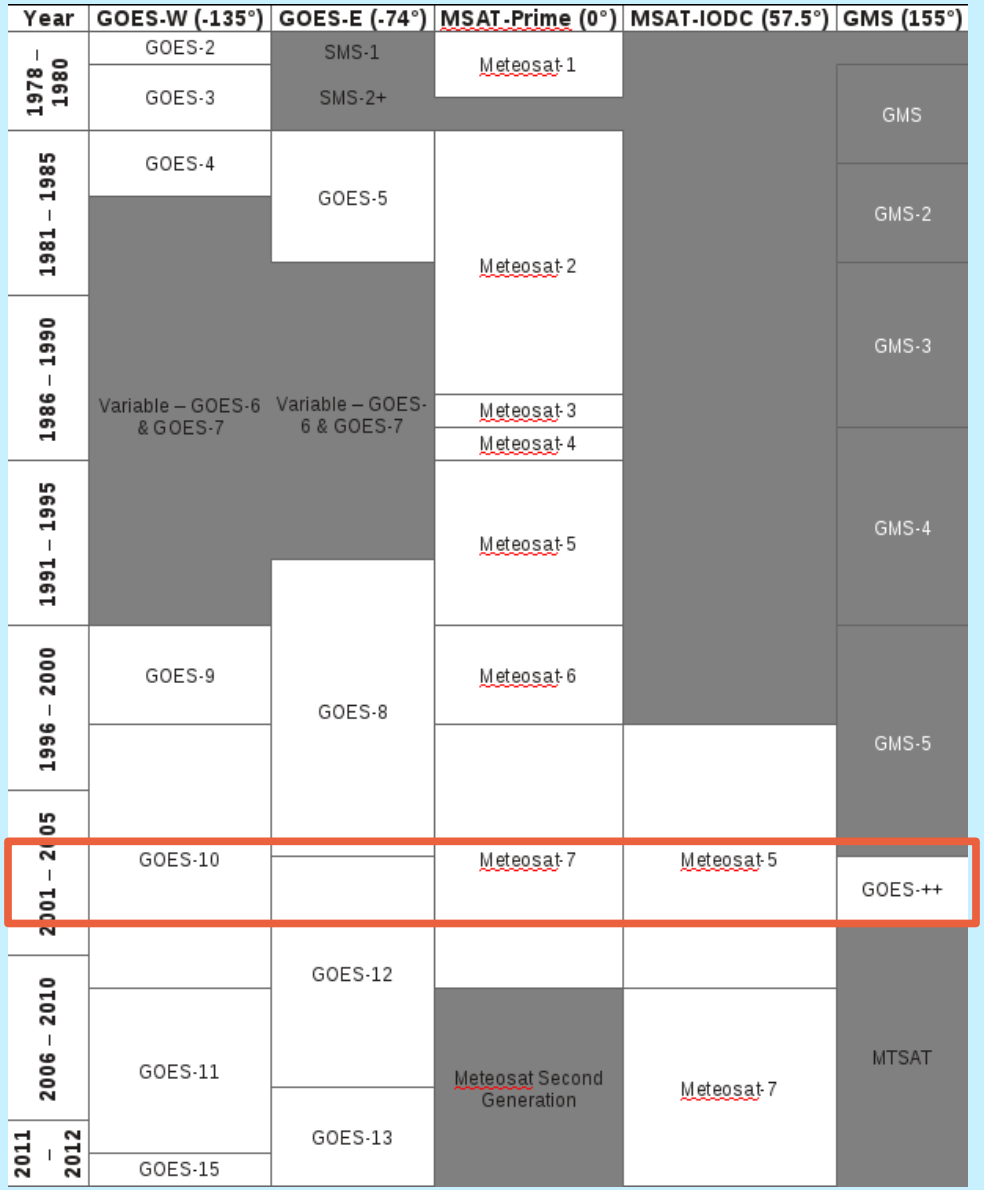


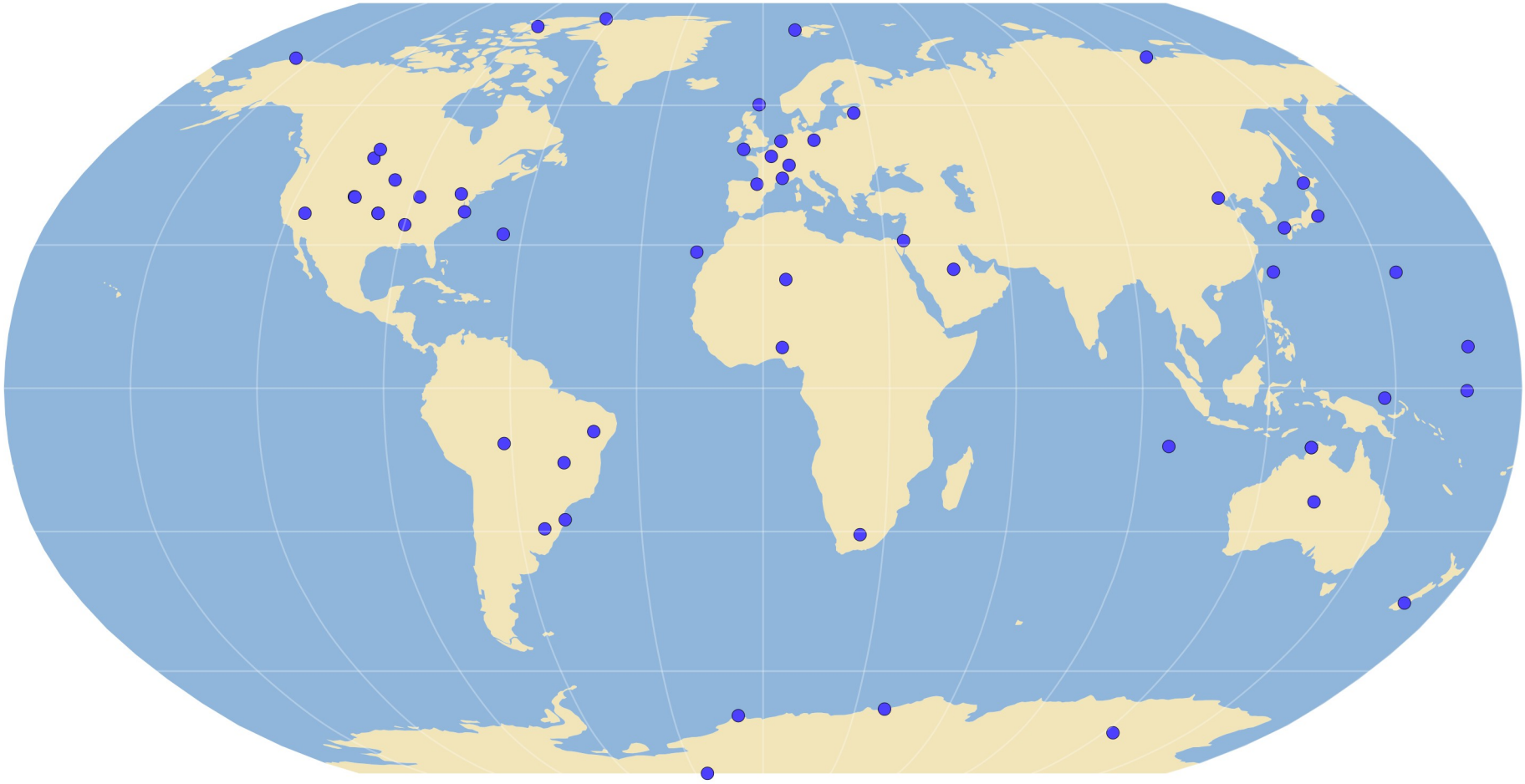

1 month = ~ 3 TB

Chosen test month:

June 2003

*Source: NOAA 2012, EUMETSAT 2012, JMA 2012, diagram by author*

# HALO:
# Validation stations



*Source: BSRN 2012, map by author*

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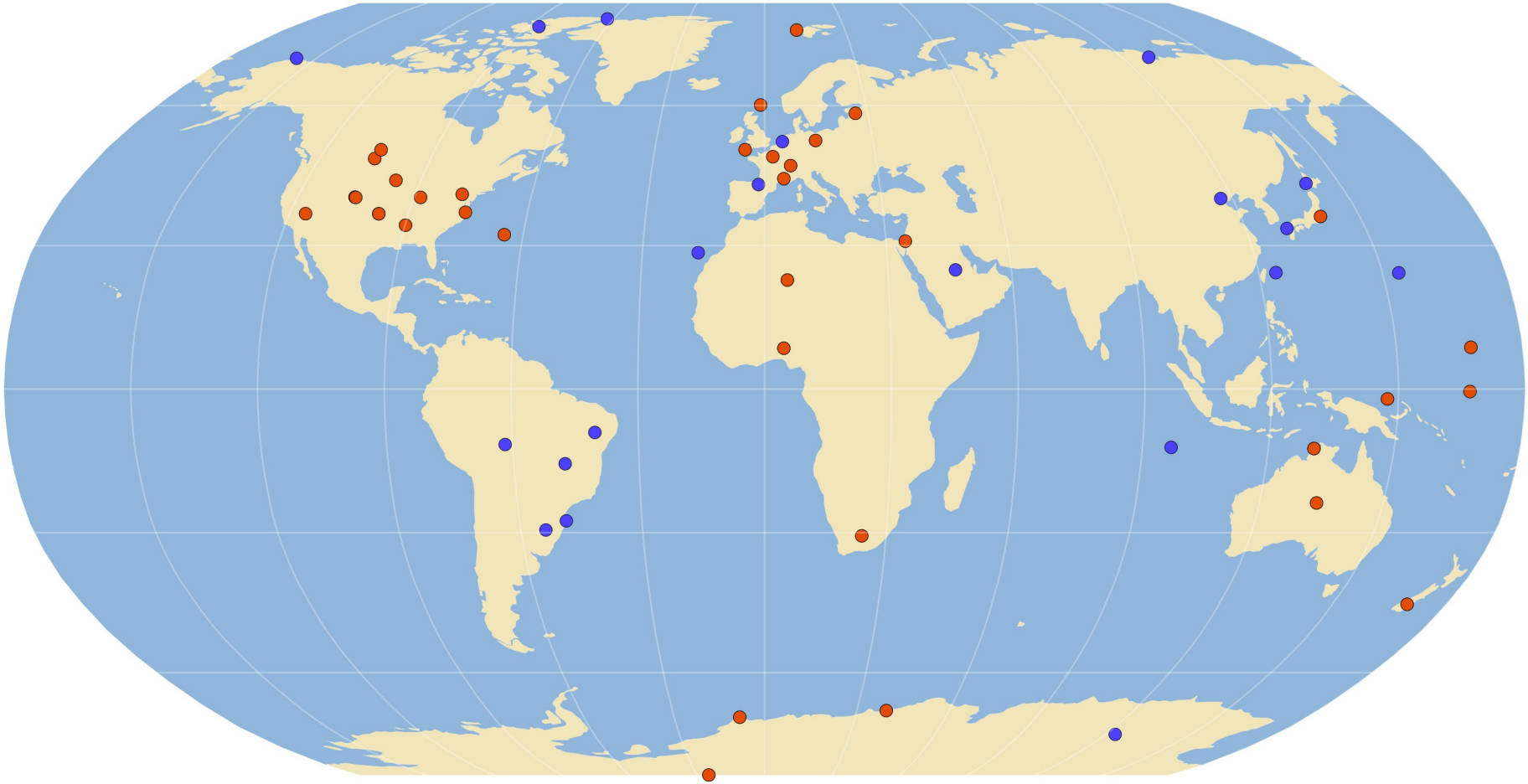

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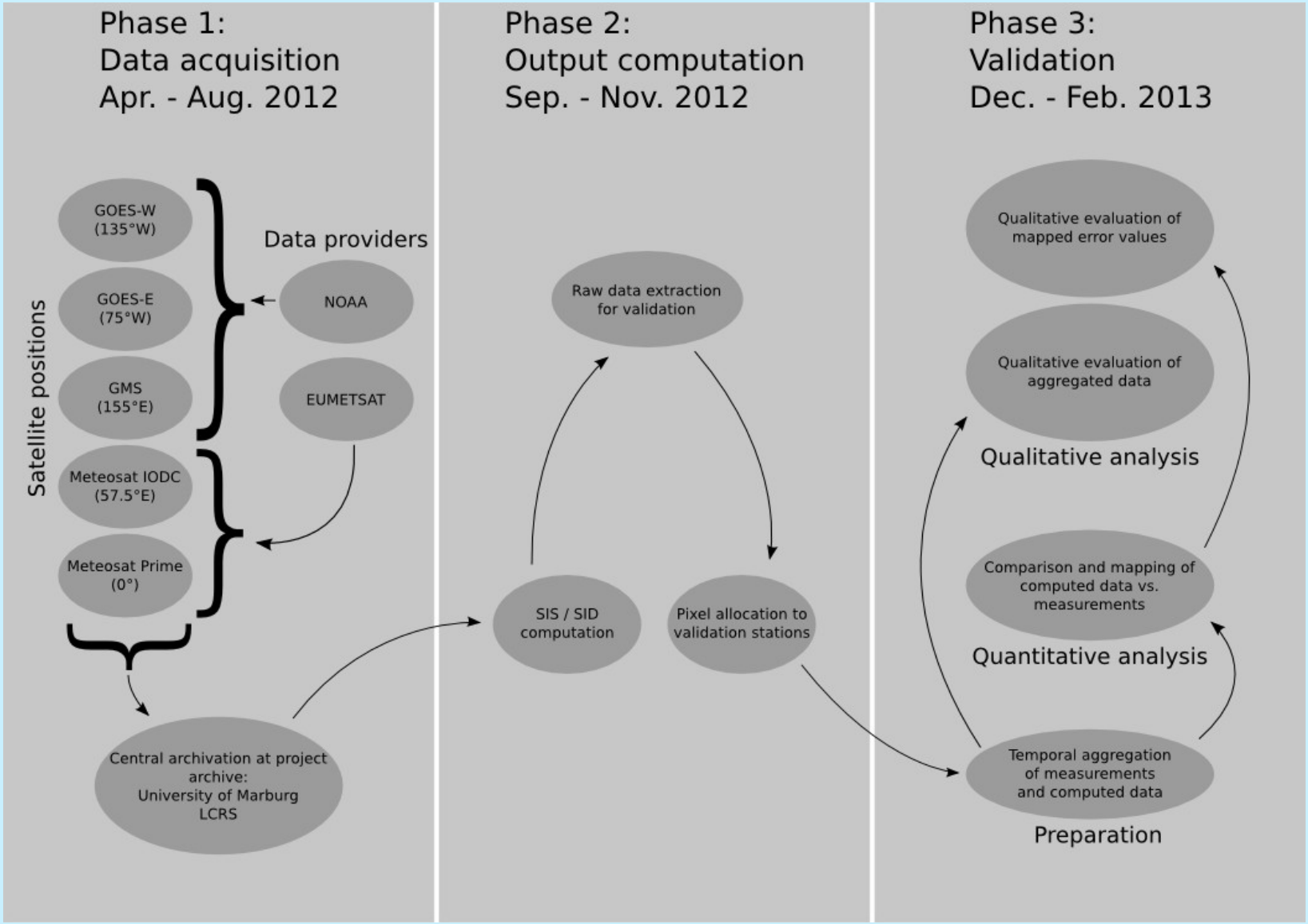
# HALO: Workflow





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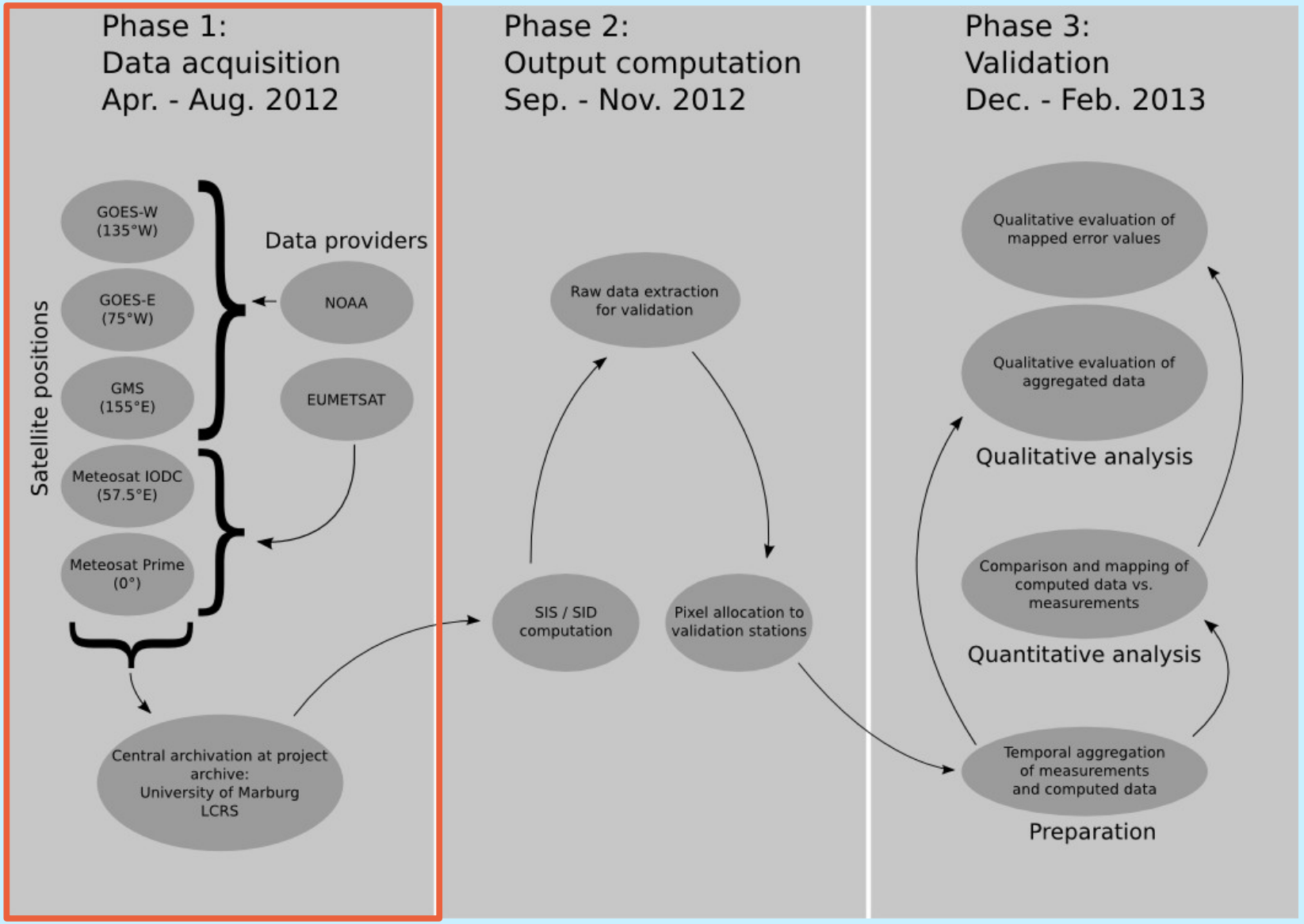

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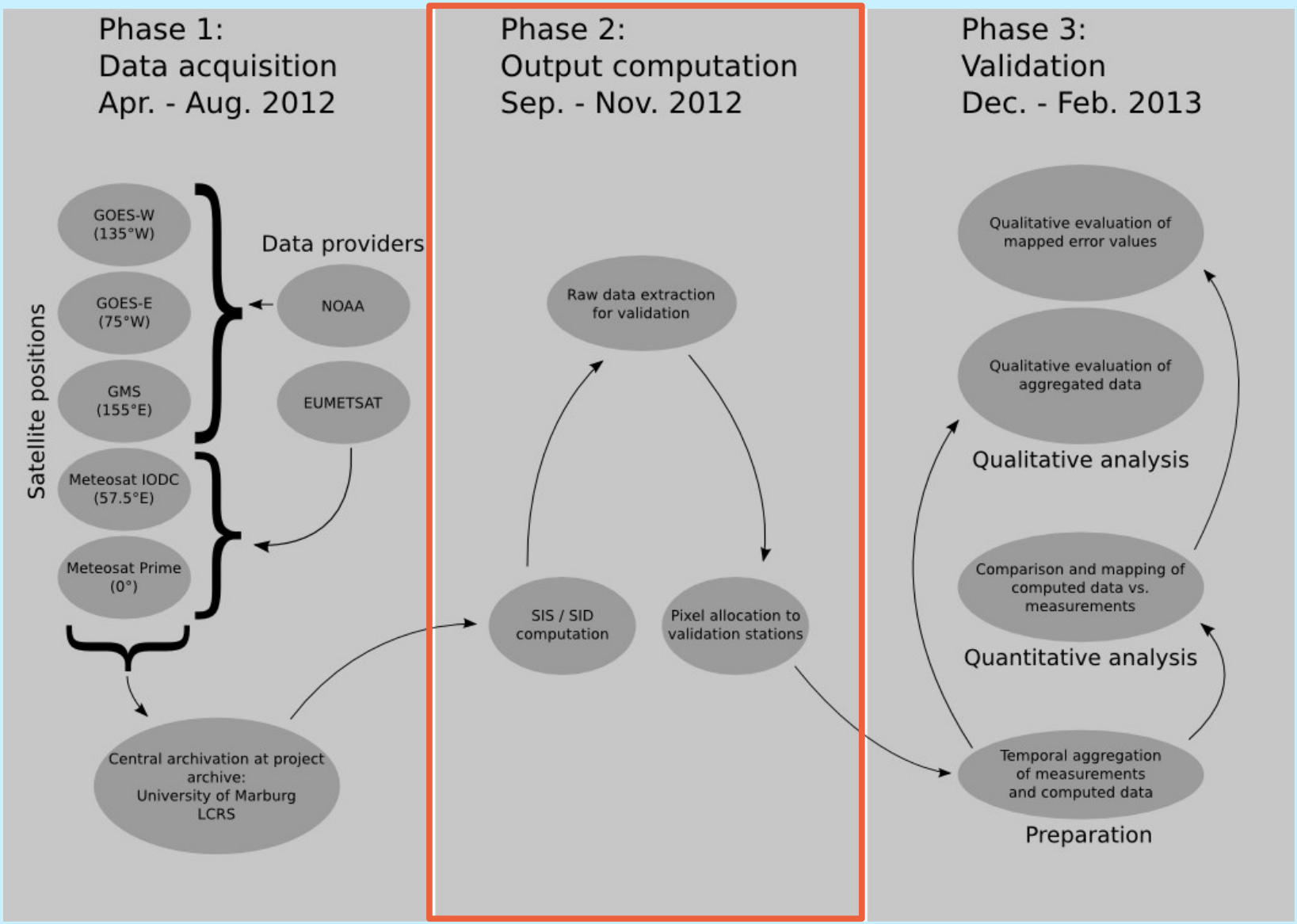

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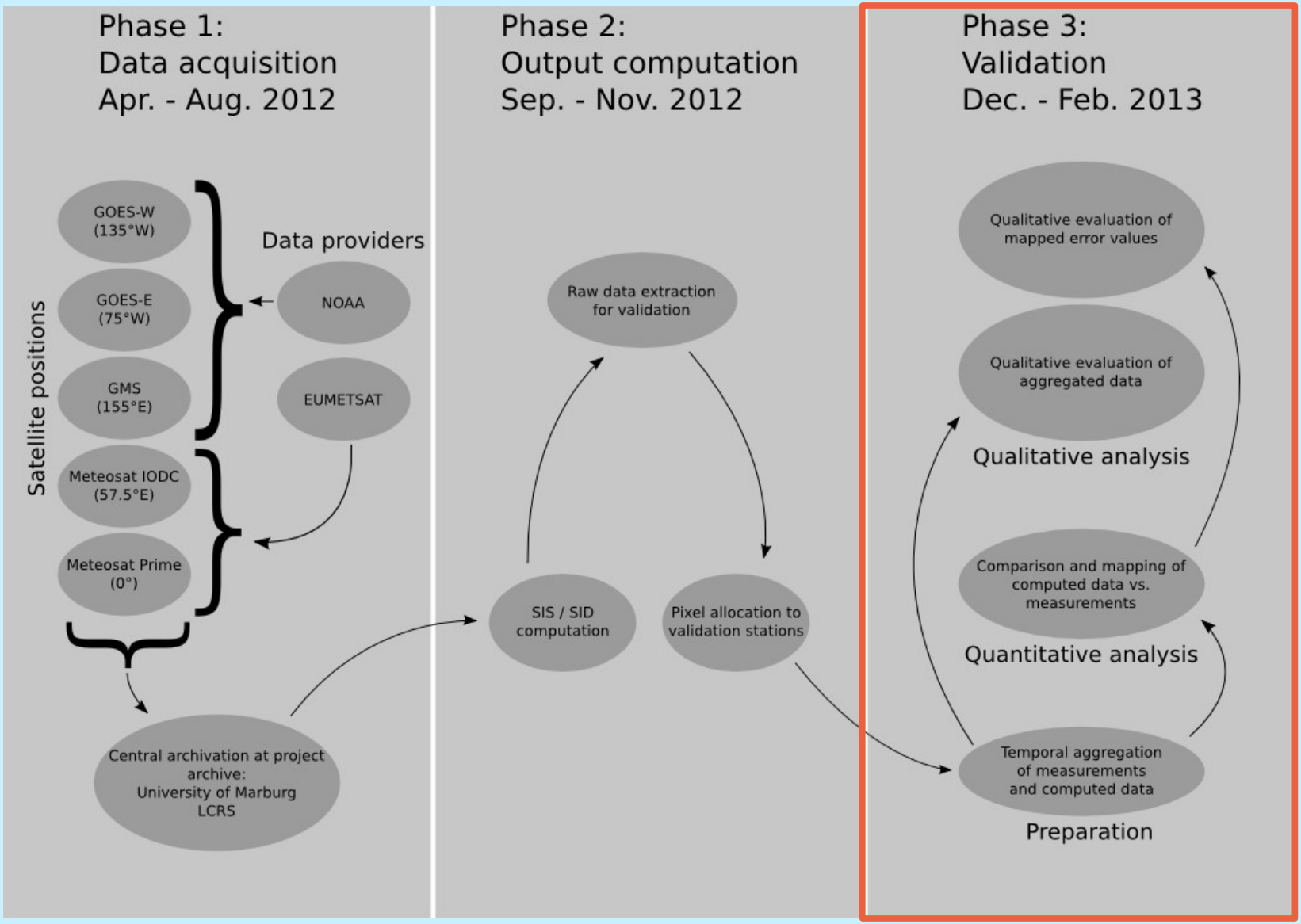
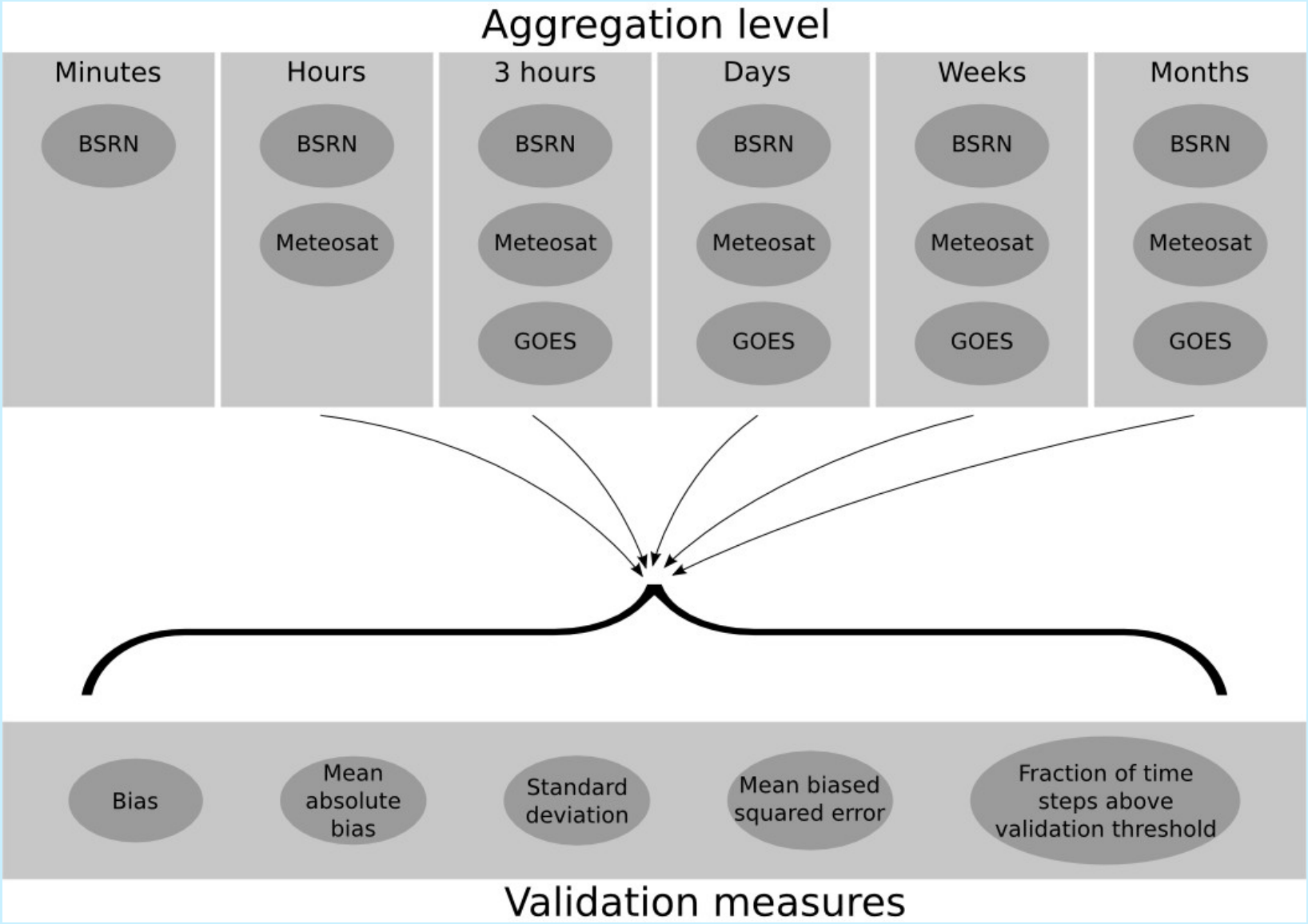


# HALO: Validation scheme





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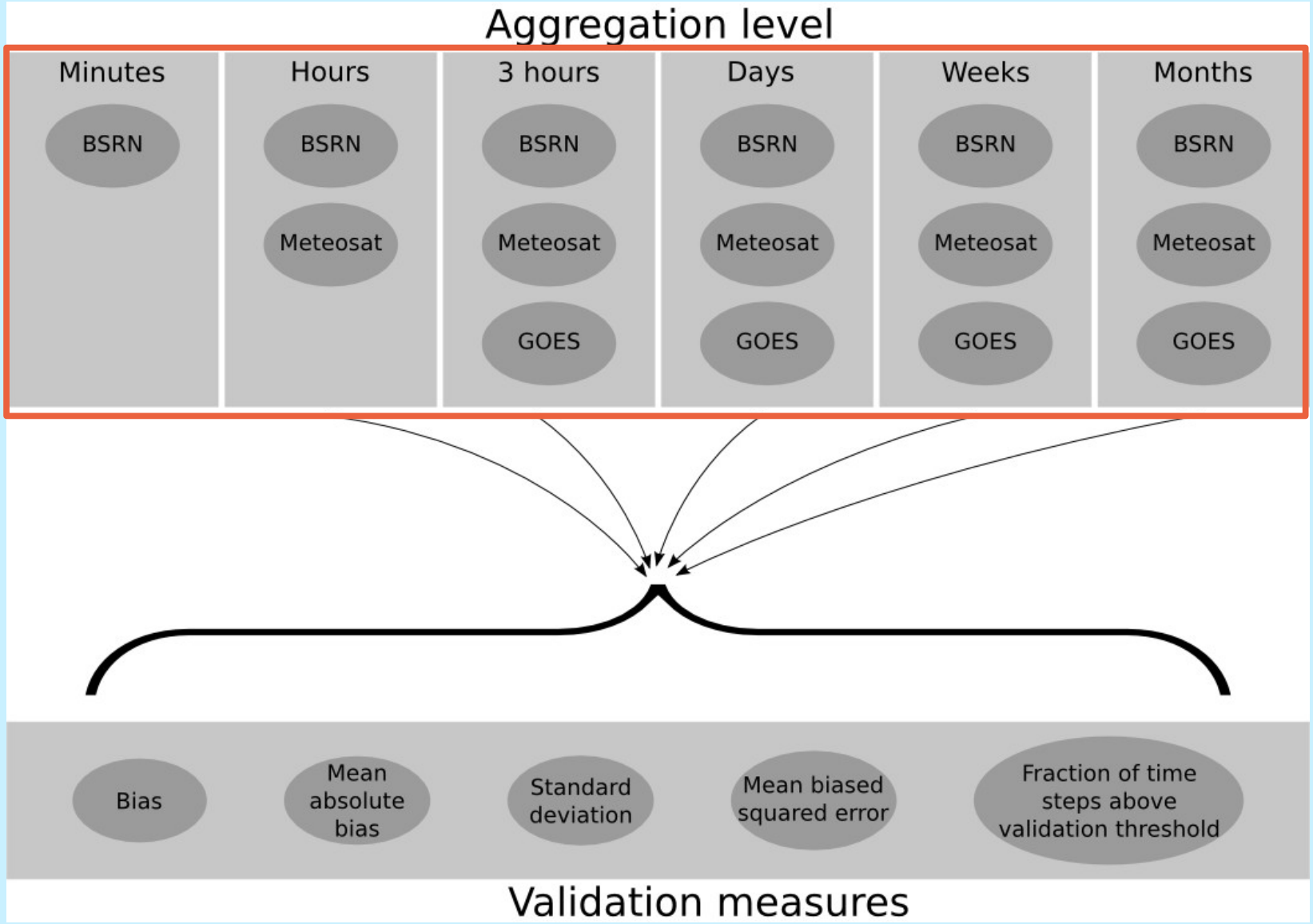
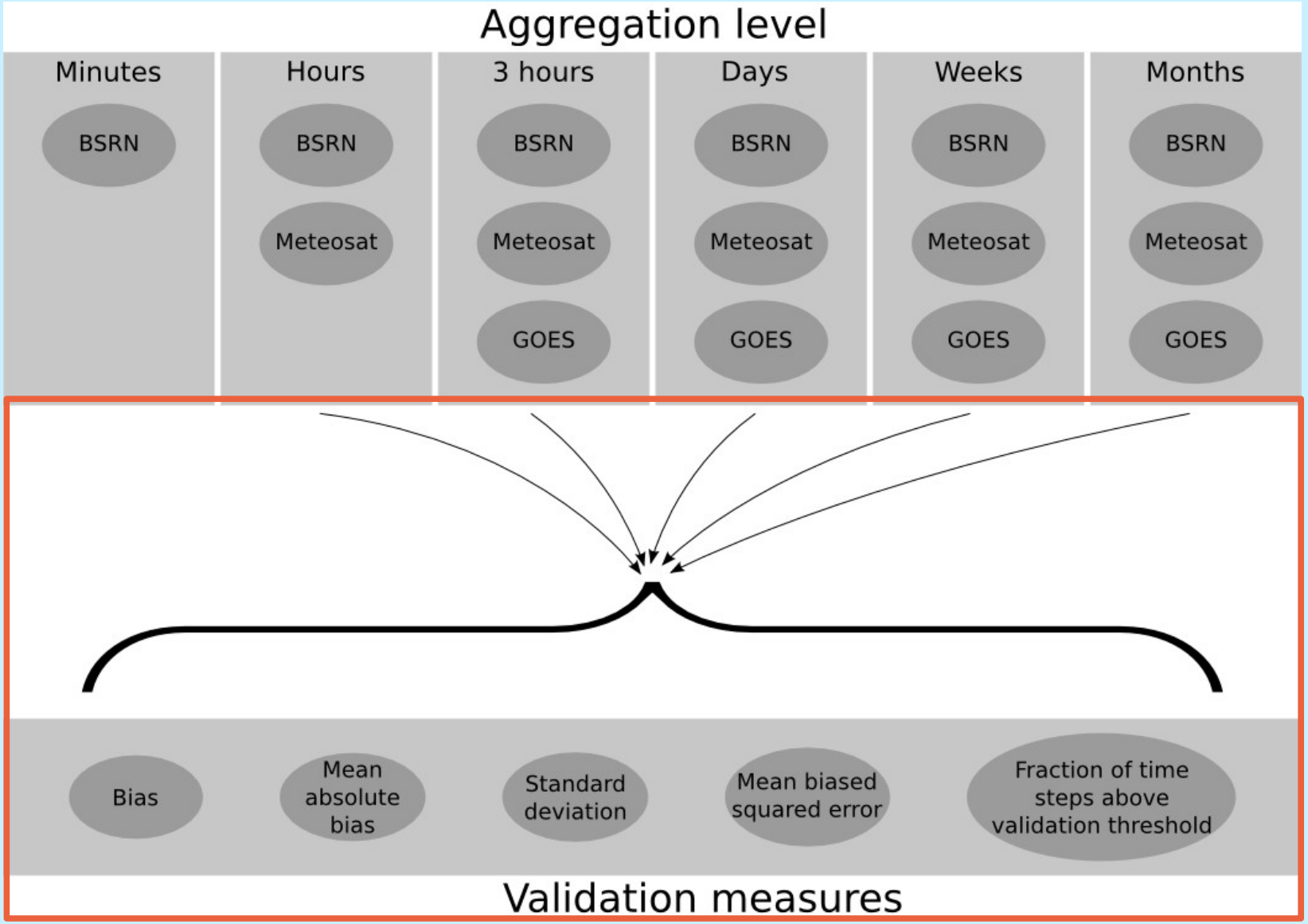
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