

GRUAN Analysis Team for Network Design and Operations Research: Concept and Work Plan

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GATNDOR background

- *GRUAN Analysis Team for Network Design and Operations Research* = GATNDOR (ugh ☹)
- *Created:* March 2009 at GRUAN ICM-1, Norman, Oklahoma
- *Purpose:* To perform focused, short-term analyses addressing specific questions of the GRUAN science and management community
- *Approach:* Obtain insight from past observations for optimizing the design and implementation of the GRUAN observational program



Current team members

Name	Affiliation	Expertise
Reinout Boers	KNMI De Bilt, The Netherlands	station management, thermodynamics, remote sensing, observations
Tom Gardiner	NPL Teddington, UK	metrology
Dian Seidel (chair)	NOAA Silver Spring, MD, USA	climate variability and change
Junhong Wang	NCAR Boulder, CO, USA	observing systems



Mode of operation

- GRUAN community identifies research questions
- Team assesses possible research approaches
- Team members take responsibility for specific research projects, recruiting collaborators as appropriate
- Team “meets” quarterly by conference call
- GRUAN ICM, WG-ARO provide feedback and evaluation



Current research topics

- *Topic 1: Collocation of Observations*
- *Topic 2: Management of Change*
- *Topic 3: Scheduling Protocol*
- *Topic 4: Quantifying the Value of Complementary Observations*
- *Topic 5: Network Configuration*



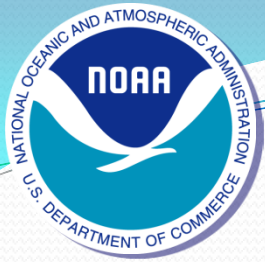
1: Collocation of Observations

- **Research Question:** How far apart can observations be and yet be considered to effectively sample the same atmospheric column?
- **Approach:** Examine typical horizontal displacements of radiosondes from the launch location to determine the spatial representativeness of balloon measurement systems.
- **Team Lead:** Dian Seidel
- **Project Status:** Preliminary results



2: Management of change

- **Research Question:** What co-incident independent measurements, metadata, and overlap between old and new instruments are needed to ensure a homogeneous record?
- **Approach:** Using data from stations with long time series, reliable metadata, redundant measurements, and instrument overlaps, attempt to identify bias adjustments using objective statistical methods and verify them using metadata and redundant observations.
- **Team Lead:** Junhong Wang
- **Project Status:** Preliminary results



3: Scheduling protocol

- **Research Question:** How frequent must profile measurements be made to adequately characterize long-term changes?
- **Approach:** Using data from a station with a long record of high-temporal-resolution observations , subsample according to various scheduling protocols to determine consistency of long-term changes with those from the complete record.
- **Team Lead:** Tom Gardiner & Reinout Boers
- **Project Status:** Planning stages



4: Quantifying the value of complementary observations

- **Research Question:** How much is measurement uncertainty reduced by having redundant or complementary measurements of a given variable?
- **Approach:** Using data from a highly-instrumented location, estimate uncertainty of typical profiles based on individual profiling systems separately, and in various combinations.
- **Team Lead:** Junhong Wang
- **Project Status:** Preliminary results



5: Network configuration

- **Research Question:** Where and how many GRUAN stations are needed to adequately characterize long-term climate changes?
- **Approach:** Analysis of spatial information of relevant climate variables to assess variability between neighboring stations using statistical criteria.
- **Team Lead:** TBD
- **Project Status:** Idea stage



GATNDOR goals at ICM2

- Get feedback on current and planned work
- Gauge interest of larger research community
- Assess the GATNDOR approach in overall GRUAN context
- Consider sources of GATNDOR support
- Determine most productive path forward



We absolutely welcome
your input.

Thank you!