Notes taken by Ana Maria Ospina Sierra at the Smart Grids Big Data Workshop, 5/8/2018

PANEL 1: "Data analytics"

From corrective to predictive handling of resilience.
Needed: accurate predictions at three temporal scales (real-time, mid-term, and long-term) from grid and weather measurement management.

Modeling dynamics, extreme and severe events, near real time and multi-scale, modeling interoperability of interactions, robustness under failure cascade, smart data capture tools.
Our approach: Structured regression in complex Networks.

Employing multiple graphical models to learn different relationships and detecting changes in a network once they occur and adapting accordingly --> Real time approach

Structured regression in multi-scale networks (MSN-GCRF)
APPLICATION: Predict monthly admission for each disease for each hospital in California.
Main challenges: data analytics view
1. Complexity
2. Heterogeneity
3. Dynamics

Data processing pipeline
Shapefile databases = CVS datasets = Network analysis
Inter across-layer connections Different GIS layers can be connected due to their complex interdependencies (not complete observable)

In the panel discussion:

1. It is necessary to have an effective of data analytics
2. Desicion making using data analytics: Right now we are closing the gap between analytics and the value for real world.
3. Couple of key foundation concepts:
3.1. Strong foundation in the utilities, communication from IT and OT. Currently, they are separate and they need to share information.
3.2. We are using all the data like the same type. We need to differentiate each type of data that we have. More benefits for the understanding of the different types of data.
4. Data requirements in each companies are different.
5. Why the things are not more automatic? Consequences of 2 revolutions a) signal processing, and b) machine learning.

Focus Group Sessions
"GEO-spatial representation of data and grid models"

1. Visualization in relation with different ways of resources how to predict and output regarding with the inputs.
2. Data management
3. Monitoring voltage.
4. Analytics: dynamic shapefile and raster. Spatial analysis with dynamic models.

6. Decision support: situation awareness. Weather patrons.
7. Analytics: Aplications in GIS have to focus in rebuild the data. Start with model, identify where they are in the map and how there are affected for specific disturbances. Electric vehicles with charging systems

"Meteorological Forecast and Weather Hazards".
Grid interruption 30% of outage in the USA are weather related.
Inertia present in renewable energy production wind, solar.
Demand in many areas demand ramps-up sharply with high temperatures

USES FOR WEATHER DATA
Planning and research.
Estimate future renewable production potential.
Measuring risk of weather hazards.
Designing and testing new transmission line plans.
Forecasting renewable.
Marketing purposes.
Major current trend in weather prediction.
Account for uncertainty and non-linearity when forecast length exceeds many times the time-scale of the scale big predicted.