

## Normalizing Reliability for Weather

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IEEE Task Force on Weather Normalization of Reliability Indices

Tom Short, EPRI

## Task-Force Paper

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- ◆ Final draft: ready for presentation at the IEEE PES General meeting in Pittsburgh July 20-24, 2008
  
- ◆ Heide Caswell, Vince Forte, John Fraser, Anil Pahwa, Tom Short, Mark Thatcher, Val Werner

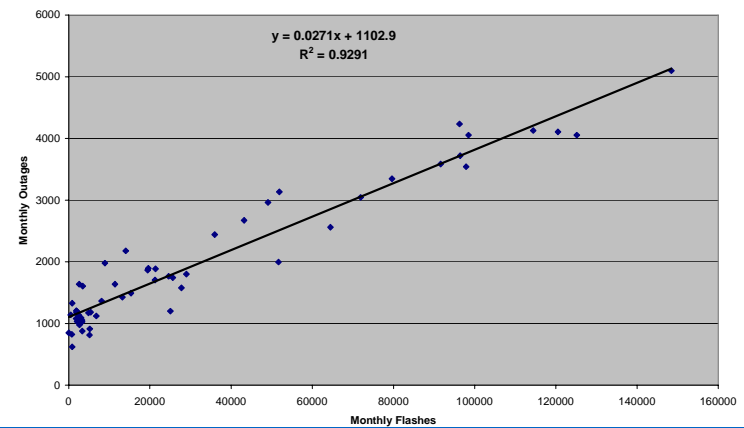
## Task Force Paper Outline

- ◆ Weather data
- ◆ Normalization Approaches
  - ◆ Outage Database Indicators of Weather
  - ◆ Modified Beta Methods
  - ◆ Normalizing based on Statistical Correlations
- ◆ Appropriate reliability data to use
- ◆ Statistical correlations

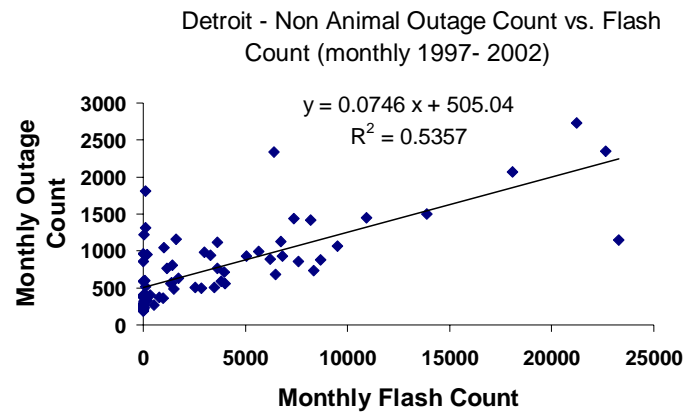
## Lightning – Florida

Monthly Flashes vs. Outages (>1994)  
Less Animals

Charlie Williams,  
Progress Florida



## Lightning – Detroit



John McDaniel, Detroit Edison

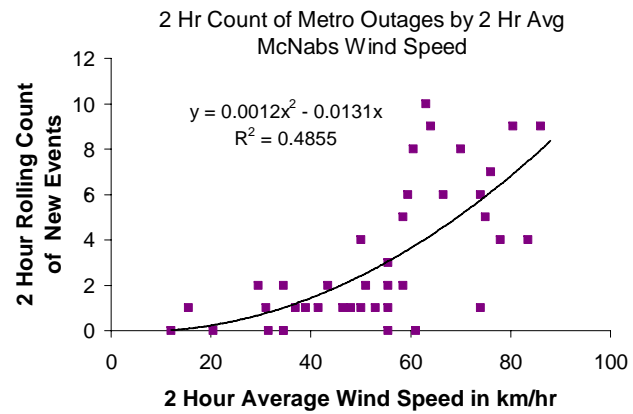
### Weather

- ◆ Match up weather data to circuits
- ◆ Daily, weekly, or monthly

### Reliability data

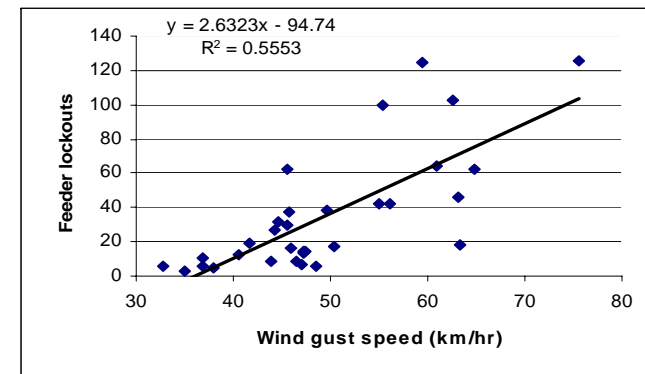
- ◆ Exclude non-weather events, often animals
- ◆ Assign unknown to lightning / animal based on season, time, and weather

## Wind – Nova Scotia



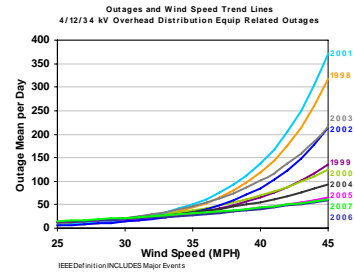
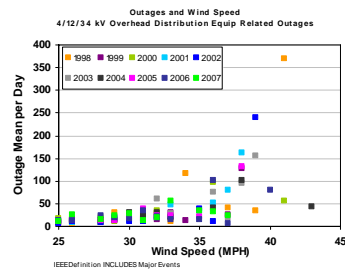
John Fraser, Nova Scotia Power

## Wind - Australia



Mat Darveniza

## Wind - Chicago

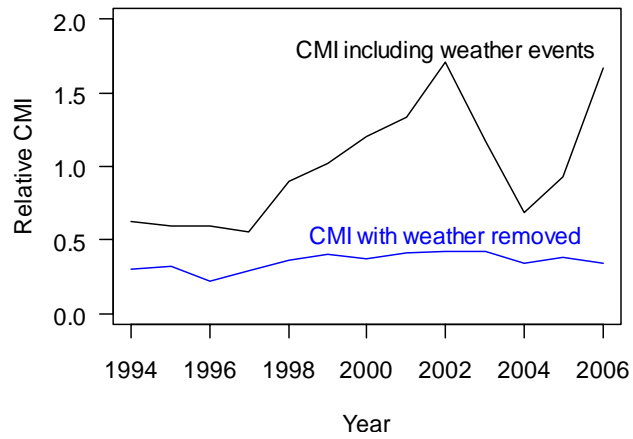


Jamie Ortega, ComEd

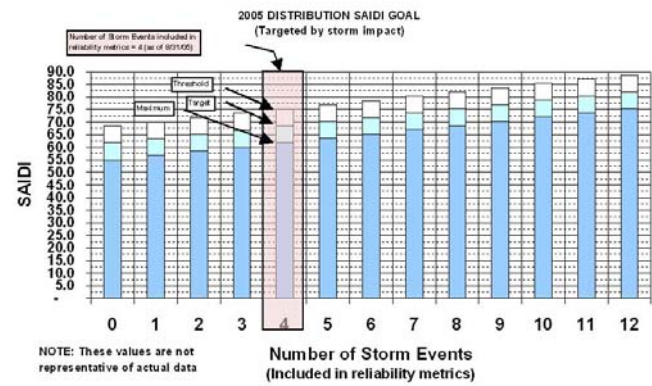
## Normalizing Approaches

- Interruption Database Indicators of Weather
- Target adjustment
- Modified Beta method
- Statistical normalizing

## Removing Weather Events



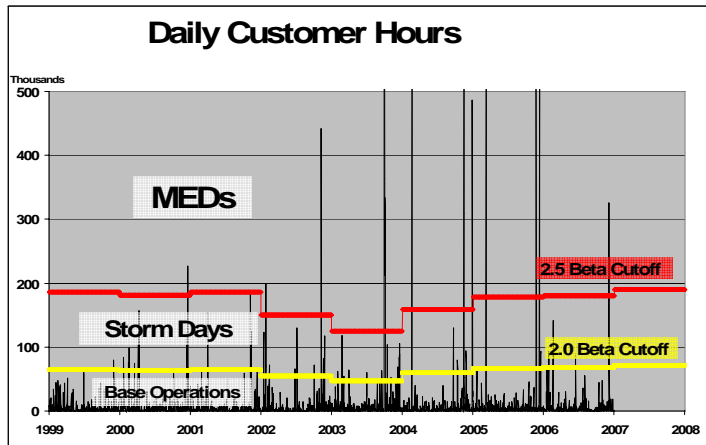
## Target Adjustment



NOTE: These values are not representative of actual data

Mark Thatcher, Kansas City Power & Light

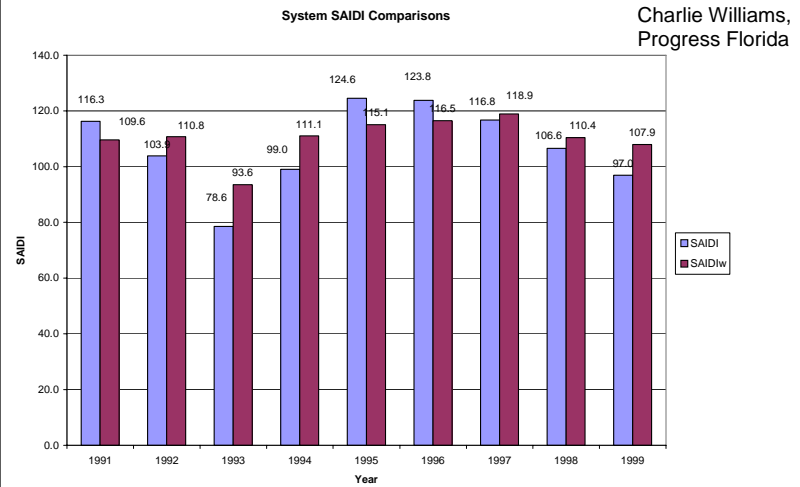
## Modified Beta



John Fraser, Nova Scotia Power

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## From Statistical Correlation to Normalization



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## Weather Normalization Task Force

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For draft copies of the paper or other inquiries,  
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