Climate & Weather Monitoring
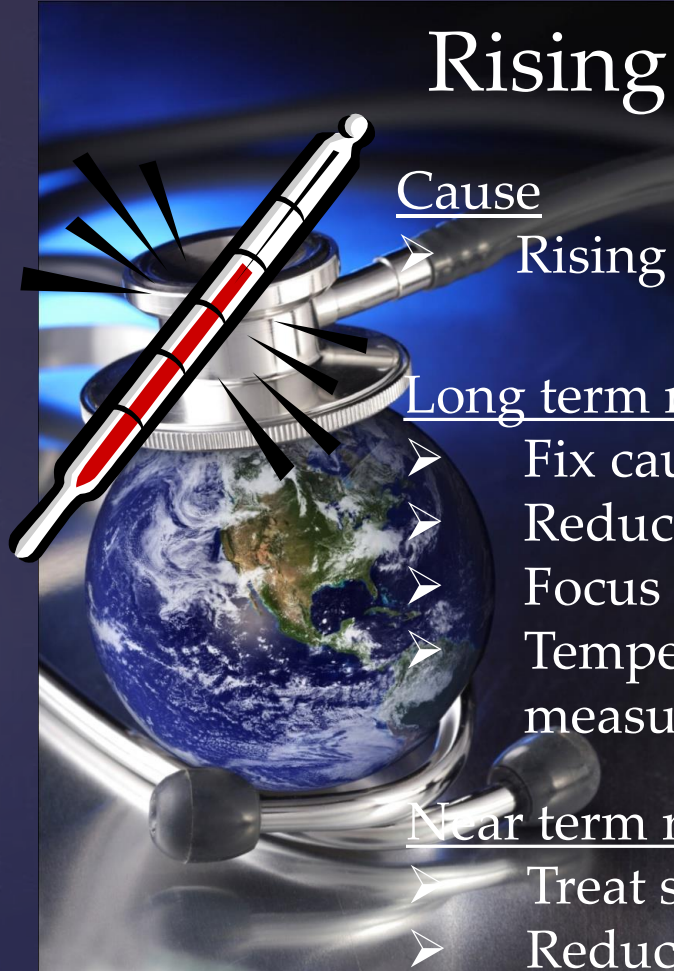
Considerations for observation network designs

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Why are we here?

Rising Temperature

Cause
- Rising Greenhouse Gases (GHG)

Long term remedy
- Fix cause at source
- Reduce GHGs
- Focus of other programs
- Temperature / *Climate* measurement done!

Near term remedy
- Treat symptoms of the illness
- Reduce real, local impact
- Help society adapt to changing climate
- Focus of <u>our</u> programs
- *Might* require different tools!

Patient is sick!

How can we define?

| Climate | Weather |

> Same general field
> Many subtle differences
> Sweeping implications

Observation Network Design

Applications …   Cost …   Sustainability

Climate   Weather
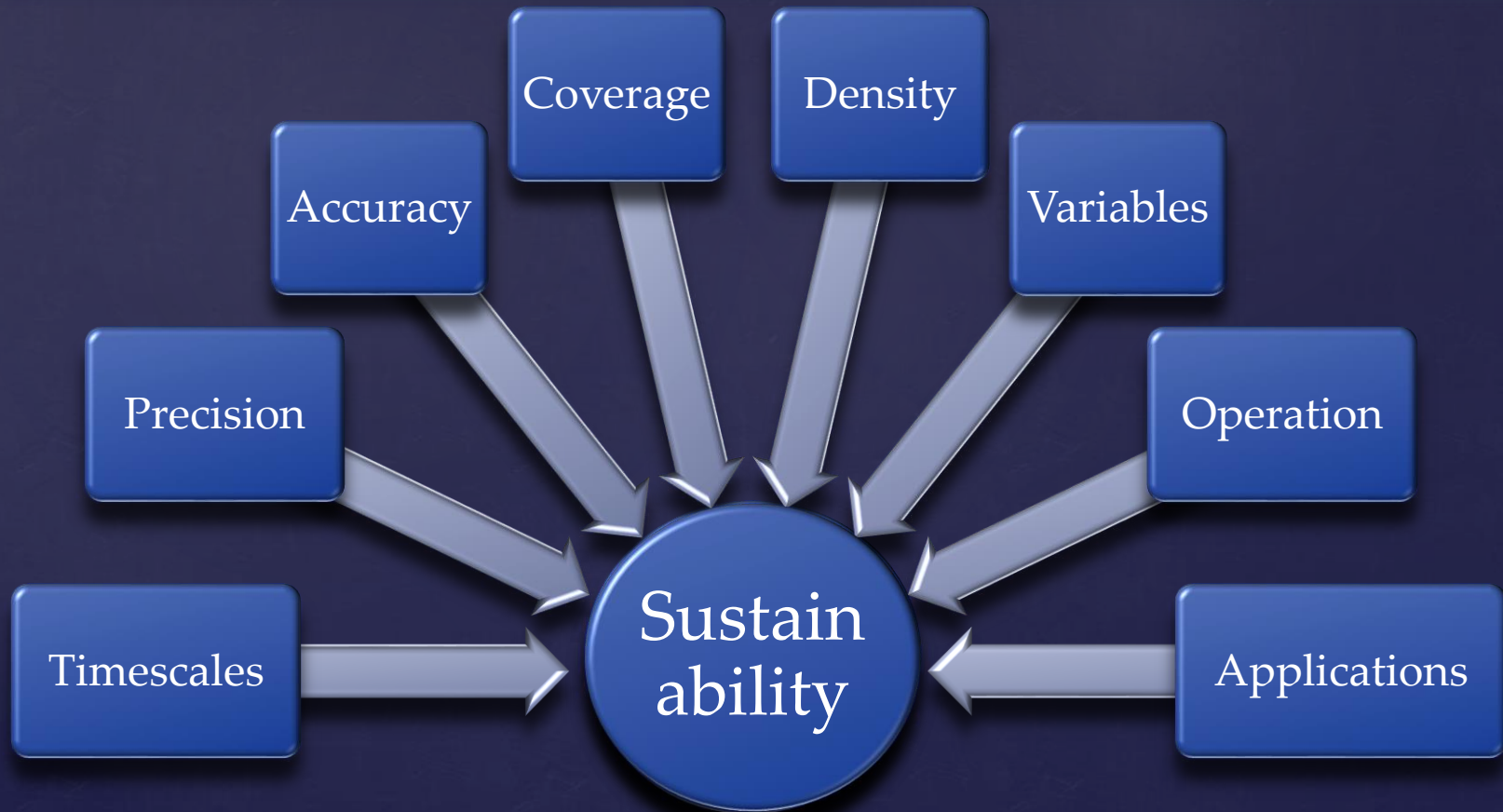
Generalizing…

Weather is Climate Variability

Weather IS Climate at a local scale

Weather is MY Climate reality

Small changes in Climate ⟹ Big changes in my Weather

Climate		Weather

← Fewer Stations Required

More Stations Required →

Climate	MATH	Weather
$$$$	MATH	$
$50,000	$1,000,000	$10,000
20	DENSITY	100

Climate	Weather

∞ ∞

Recommendation: Keep It Simple & Consistent

Temperature, Wind Speed/Direction, Relative Humidity, Precipitation
Barometric Pressure, Solar Radiation. Soil Temperature/Moisture for Ag.

VARIABLES

Climate

Weather

ALONE

- ➤ Location
- ➤ Telecommunications
- ➤ Power
- ➤ Physical Security
- ➤ Field Engineering
- ➤ Maintenance
- ➤ Data Management
- ➤ Calibration

SHARED

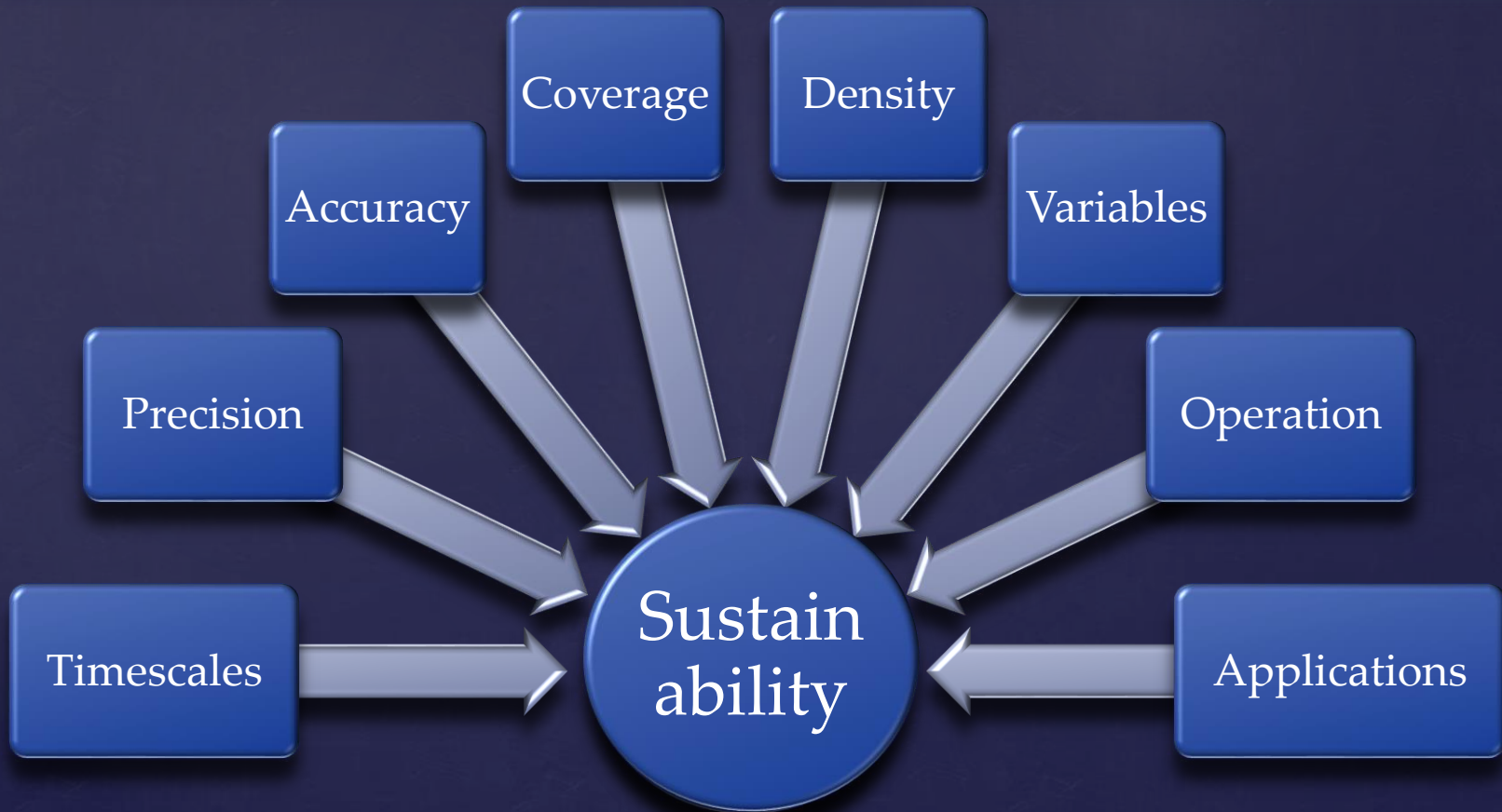# OPERATIONS

Climate

Weather

Aviation

Road Transportation

Radio

Insurance

Television

Public Weather Warnings

Climate Monitoring

Agriculture

Flood warnings

Newspaper

Energy / Utilities

Internet consumer

Mobile consumer

APPLICATIONS

Sustainability Technology!

What matters?
- ➢ Graphic Design
- ➢ Ease of use
- ➢ <u>Local</u> data
- ➢ <u>Timely</u> data
- ➢ "Simple" data
- ➢ Accurate data

APPLICATIONS: MOBILE

Reusable Data!

What matters?
➢ Local data
➢ Timely data
➢ "Simple" data
➢ Accurate data
➢ Derived data

Same basic data, with some repackaging.

APPLICATION: AGRICULTURE

Innovative Technology!

Radar-based Solution

Lightning Based Solution

1/10 the Cost

Severe Weather Warning System

Observation Network Technology

- ➢ Compact, all-in-one sensor package
- ➢ Limited, but consistent measurement variables
- ➢ Innovative severe weather package
- ➢ Near-real time data transmission
- ➢ Delivers accuracy, not precision
- ➢ Large coverage area, high density
- ➢ Establish infrastructure partnership (mobile telecommunications)
- ➢ Build network, then move focus to sustainability applications

RECOMMENDATIONS

Working Together

How can CIRDA help?
➢ Network design ideas
➢ Tech recommendations
➢ Best practice sharing
➢ Purchasing power
➢ Partner negotiation
➢ Cross border data sharing
➢ Many more!

REGIONAL COORDINATION

Rising Temperature

Cause
- ➢ Rising Greenhouse Gases

Long term remedy
- ➢ Fix cause at source
- ➢ Reduce GHGs
- ➢ Focus of other programs
- ➢ Temperature measurement done!

Near term remedy
- ➢ Treat symptoms of the illness
- ➢ Reduce real, local impact
- ➢ Help society adapt to changing climate
- ➢ Focus of our programs
- ➢ Will require different tools!

Patient is sick!

Thank you!

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