# Best Practices for Community-based Observing Networks and Systems (CBONS) – standards, quality assurance, protections and data interoperability

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Physical changes

1985

1995
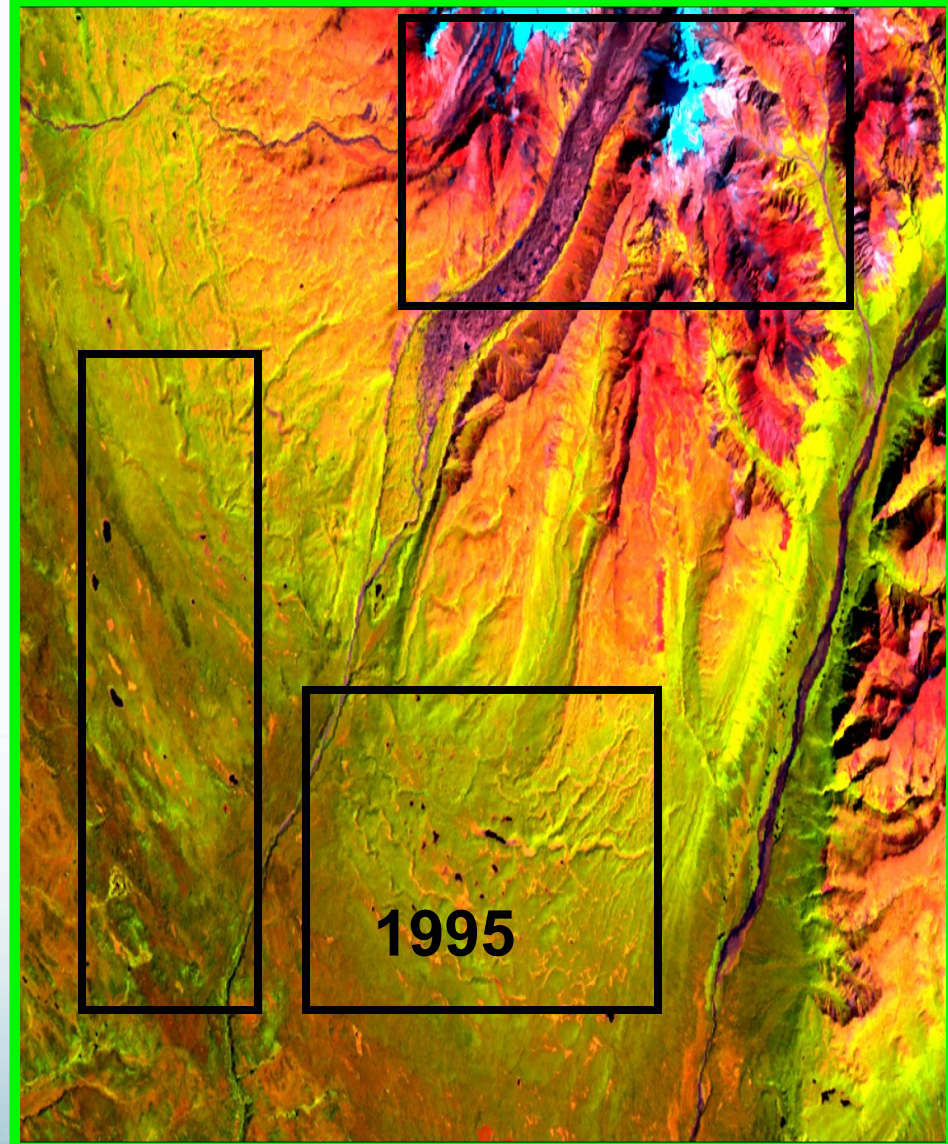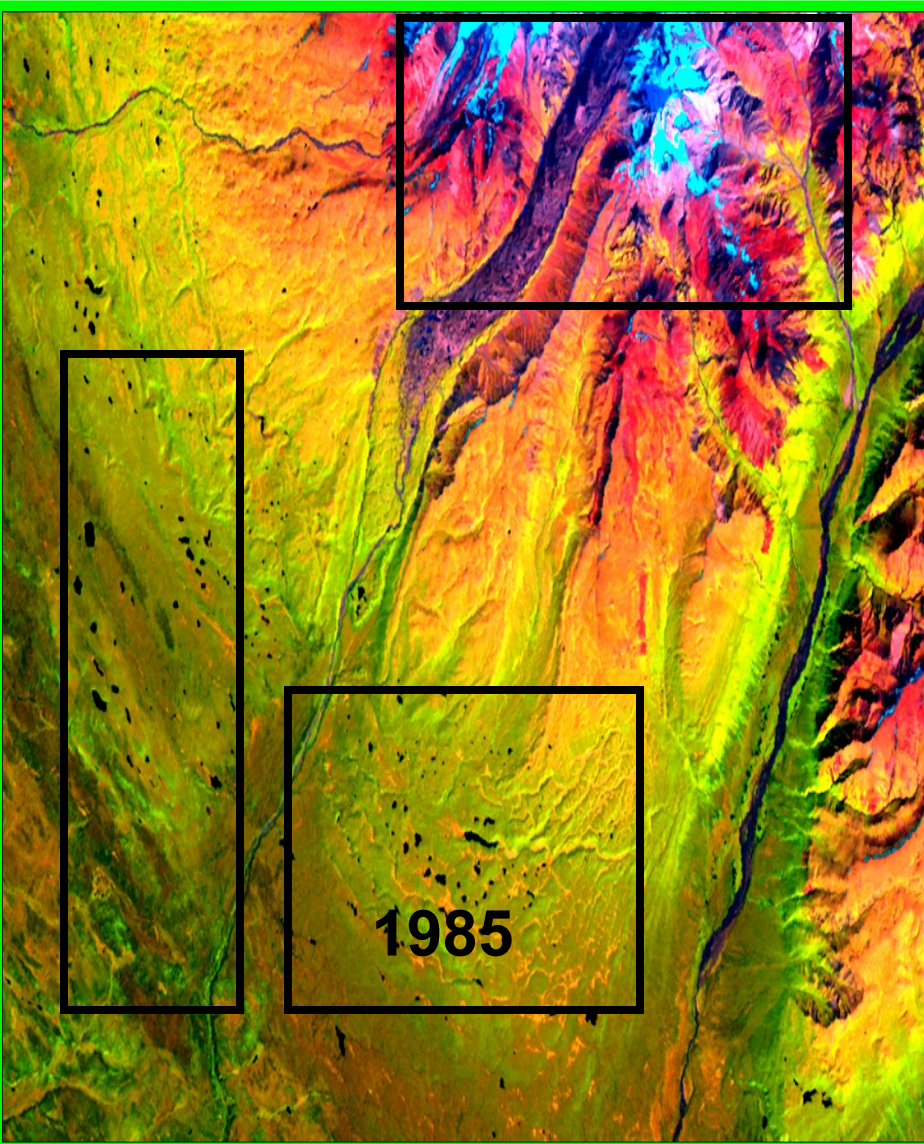
(Credit: David Verbyla, UAF)

Biological changes
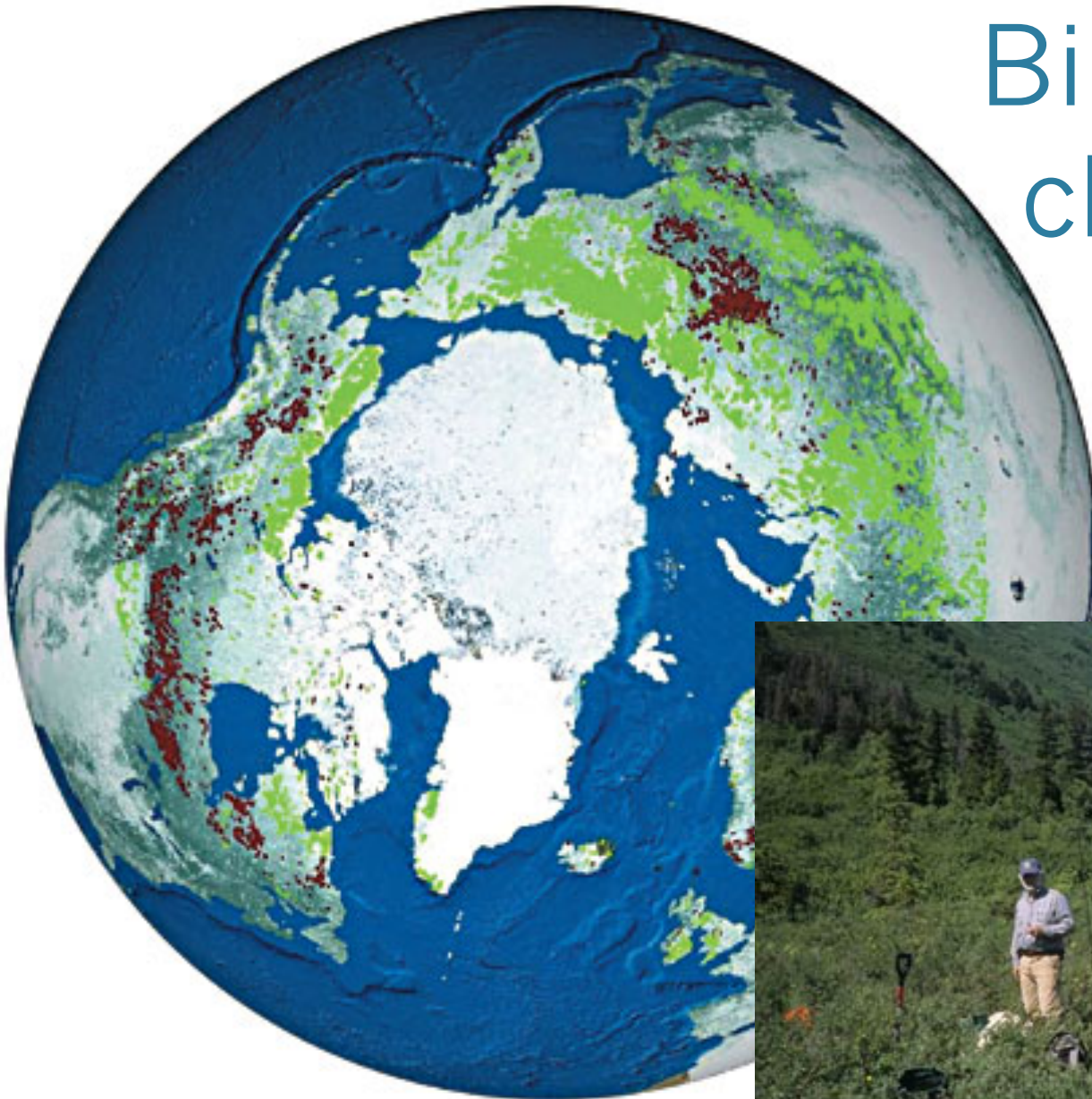
(Credit: Bunn, EOS)

(Credit: USGS)

Social changes

(Credit: AAAS)

(Credit: EALAT, Inger Marie Gaup EIRA)

CHUKOTKA

ALASKA

Gambell

Kanchalan

Savoonga

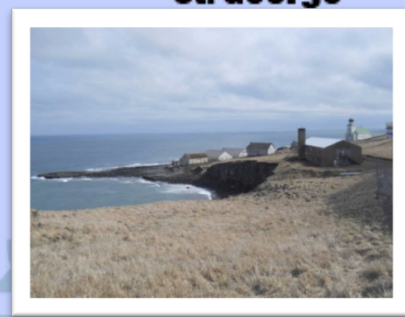**KORYAK**

Togiak

Tymlat

Sand Point

KAMCHATKA

Nikolskoye

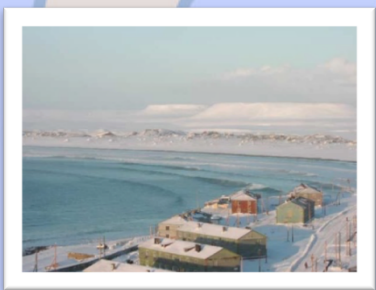**St. George**

CBONS

- critical to observation of change in the Arctic

- forecasting critical events

- devising responses to changing environments and critical events.

- community-based monitoring generally, and CBONS specifically, can offer robust frameworks for the placement of observations of change in a social context.
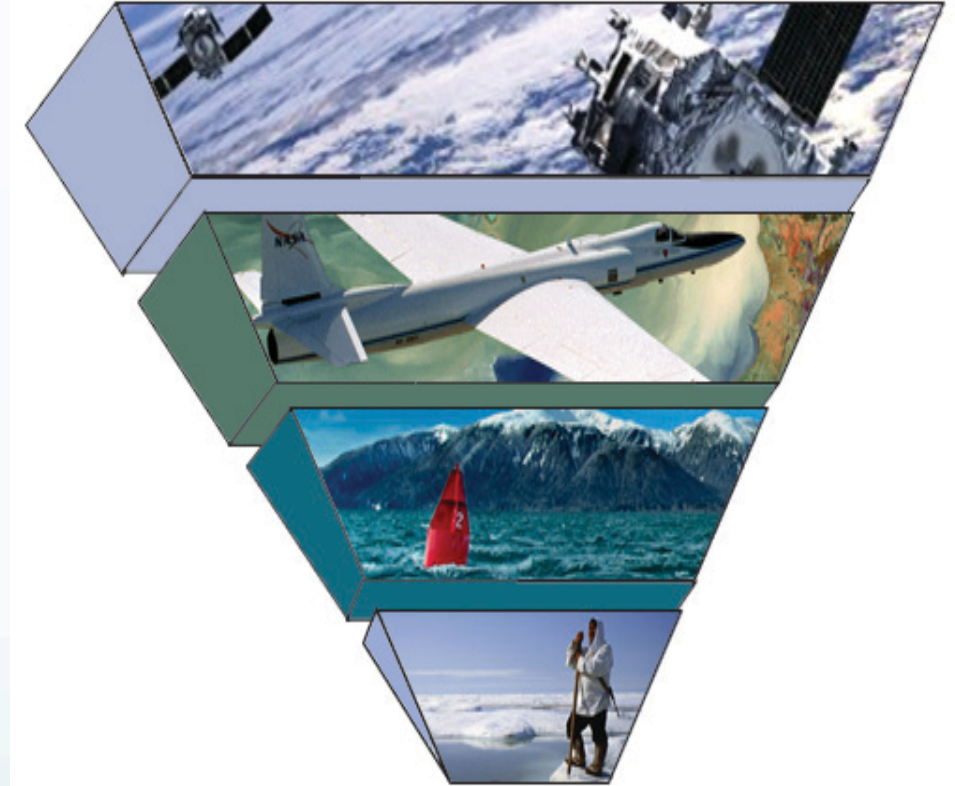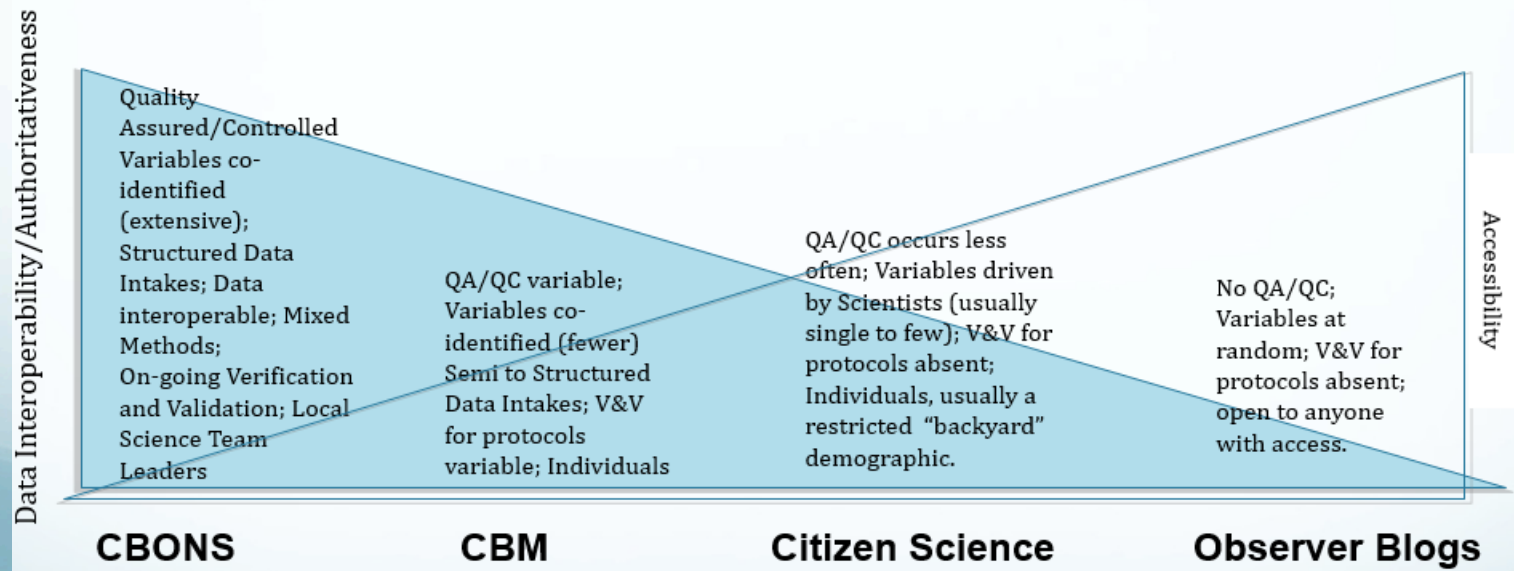
Best Practices

- Ontologies, Identities and applications

- Quality assurance

- Data interoperability and access

Ontologies, Identities and applications

- Continua of community-based observing
  - Methodological approaches
  - Integration of observations
  - Use and application of observations
  - Motivation and origination
  - Currency and expertise
  - Monitoring vs observing, or both

Data Interoperability/Authoritativeness

Quality Assured/Controlled Variables co-identified (extensive); Structured Data Intakes; Data interoperable; Mixed Methods; On-going Verification and Validation; Local Science Team Leaders

QA/QC variable; Variables co-identified (fewer) Semi to Structured Data Intakes; V&V for protocols variable; Individuals

QA/QC occurs less often; Variables driven by Scientists (usually single to few); V&V for protocols absent; Individuals, usually a restricted "backyard" demographic.

No QA/QC; Variables at random; V&V for protocols absent; open to anyone with access.

Accessibility

CBONS   **CBM**   **Citizen Science**   **Observer Blogs**

Quality assurance

- Considerations
  - Audience, purpose, message
  - Who defines data quality
    - Value, fitness of purpose
  - Open data or restricted
  - Minimum requirement metadata
  - Peer-review – community, scientific, both
- Best Practices
  - Consistency
    - Data gathering protocol and ground-truthing
  - Transparency
  - Trust and relationship with community
  - Reproducibility
  - Balance of immediacy vs thoroughness

Data Interoperability

- Making data available to the community
  - accessible (restricted vs public domain)
  - transferable (open source platforms, s/ware)
  - useable (syntax, terminology)
- Precision, detail
  - depends on purpose, fitness for use
- Best Practices
  - Collaborations and cooperation
  - Transparency (data collection and availability)
  - Legitimacy to qualitative and quantitative data
  - Engage with experts and knowledge holders early (on data structure)

Scientific Framework

- Observations must be reliable and authoritative.

- Observations can be used to develop Indicators and Indicator Clusters that signify a coupled human-environment SYSTEM transition.

- Indicators need to be organized and evaluated (analysed) using a framework such as an ACI, so that they become meaningful in representing a system.

- Continued monitoring of co-identified Indicators, using an organization/evaluation framework helps refine Indicators over time.

Outcomes

- Supporting a collaborative network for best practices in CBONS (Lead: D. Griffith)

- White paper for GEO (Lead: M.Druckenmiller, with Peter Pulsifer, Lil Alessa and Ed Washburn, EPA)

- Best Practices report (in collaboration with ARCUS and NSIDC)