



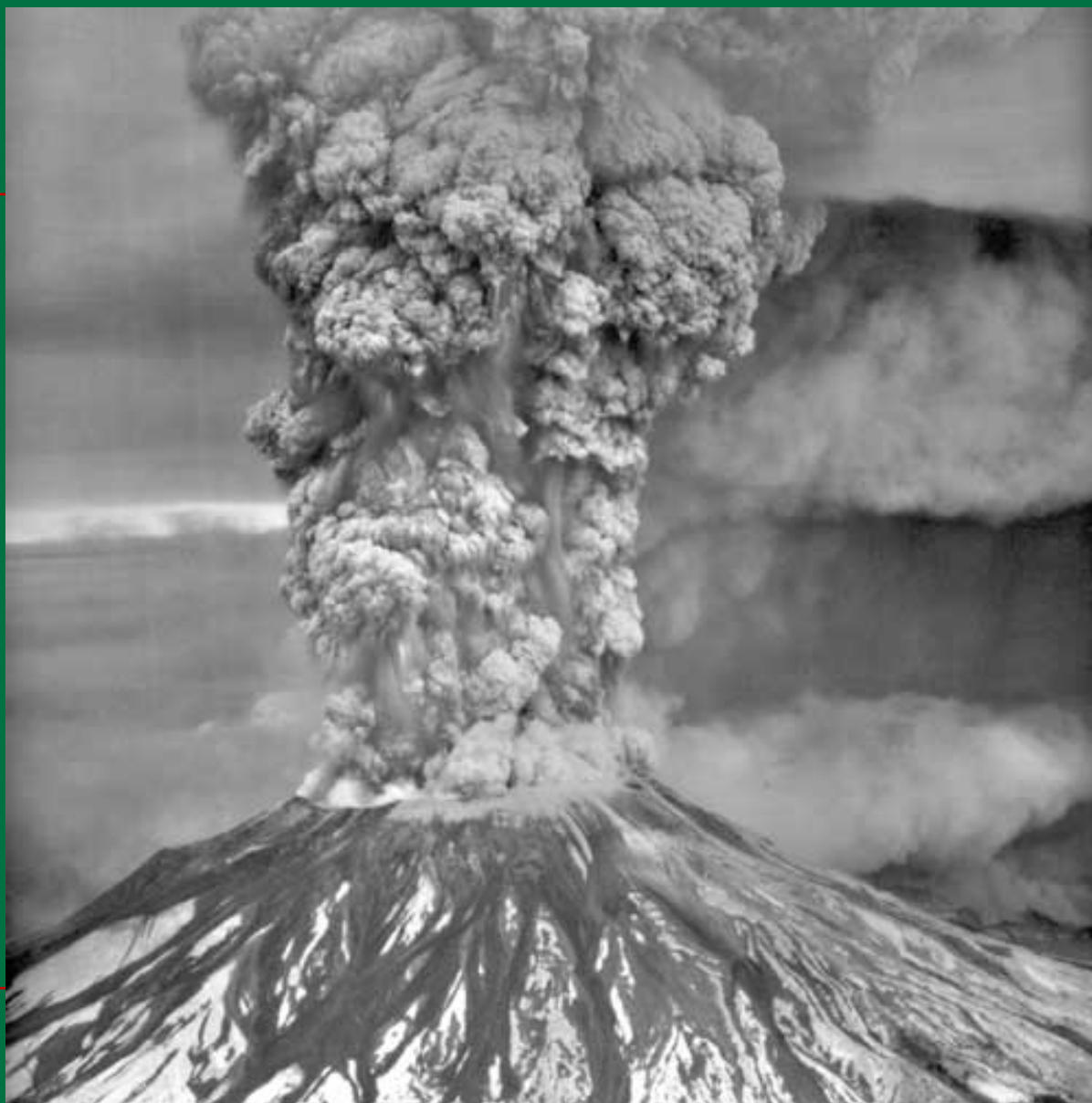
# The Challenge of Archiving and Preserving Remotely Sensed Data

**CODATA 2002**  
**Montreal, Canada**  
**30 September 2002**

# Outline

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- Background
- Relevance
- Mandate
- Challenges
- Lifecycle
- Take Home



# Background

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- **Rich, Turbulent History**
- **Analog and Digital**
- **Vibrant Program**

# Rich, Turbulent History

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- **Origins of Landsat**
- ***Land* as the Focus**
- **Incorporation of Aerial Photography**
- **Landsat Commercialization**
- **Declassification**

# Analog and Digital

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- Originally Film-Based
- Digital *Arrival* in the 1980s
- Different Management Strategies

# Vibrant Program

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- Recognition
- Separate Funding
- Dedicated Staff
- Diverse Holdings

# Diverse Holdings

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■ Declassification	1960-1980	900,000*
■ Landsat MSS	1972-1992	650,000
■ Landsat TM	1982-Today	500,000
■ AVHRR	1988-Today	275,000
■ SPOT	1986-1998	800,000
■ Landsat ETM+	1999-Today	300,000
■ Aerial Photography	1937-Today	8,200,000*

\* Film-Based

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# Guinea-Bissau, Africa

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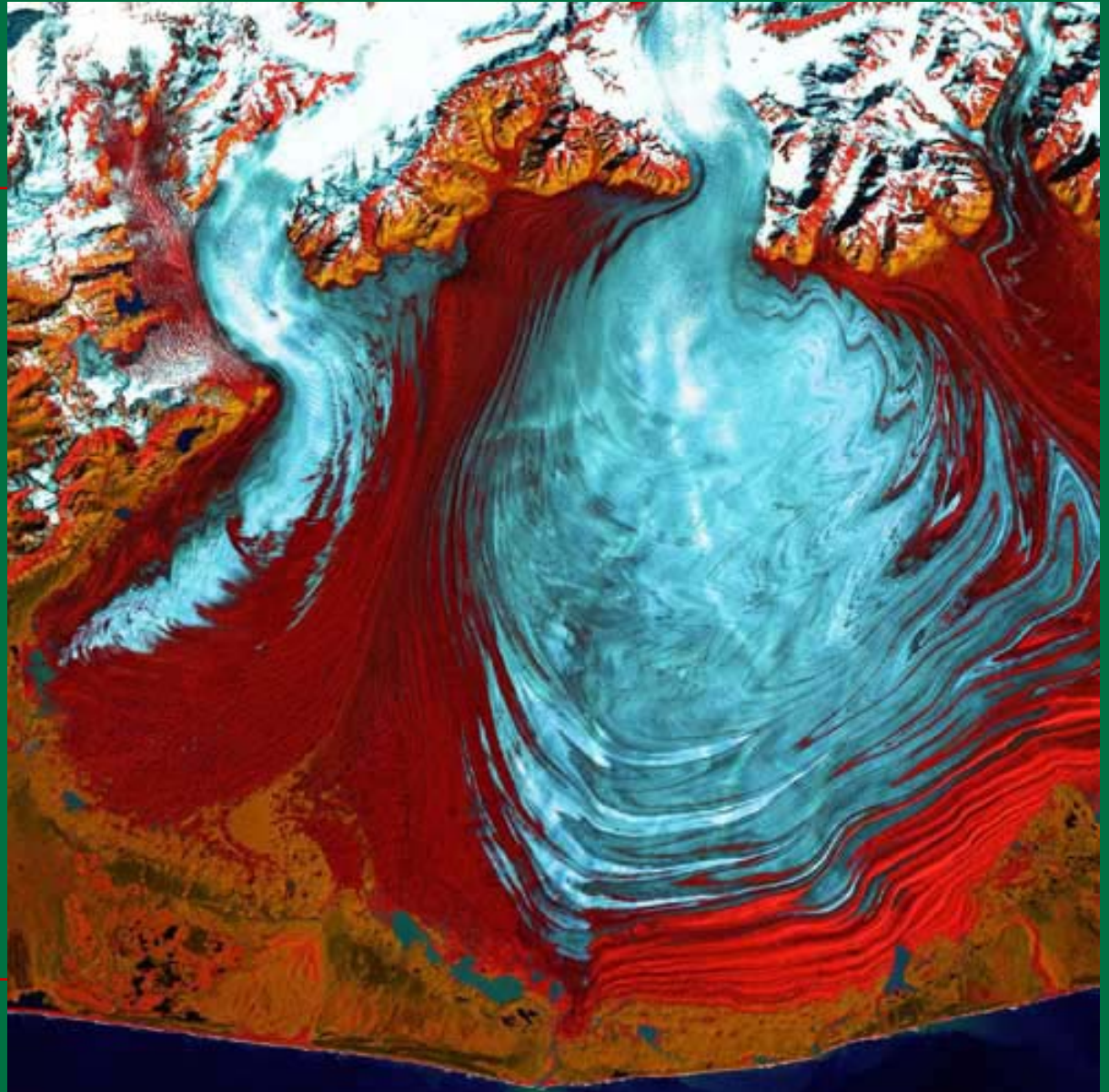
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# Ganges River Delta, India

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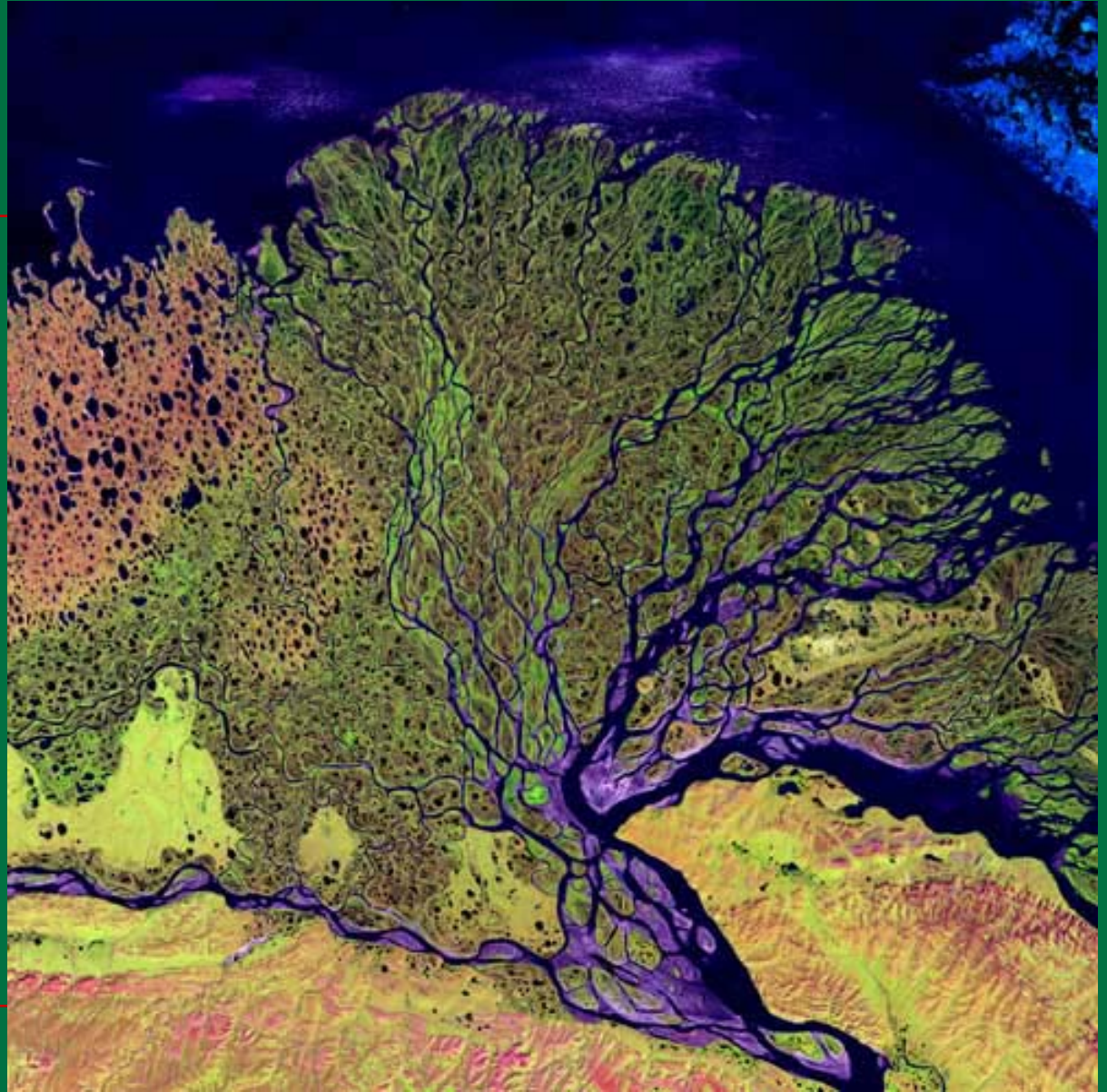
# Malaspina Glacier, Alaska



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# Lena Delta, Russia

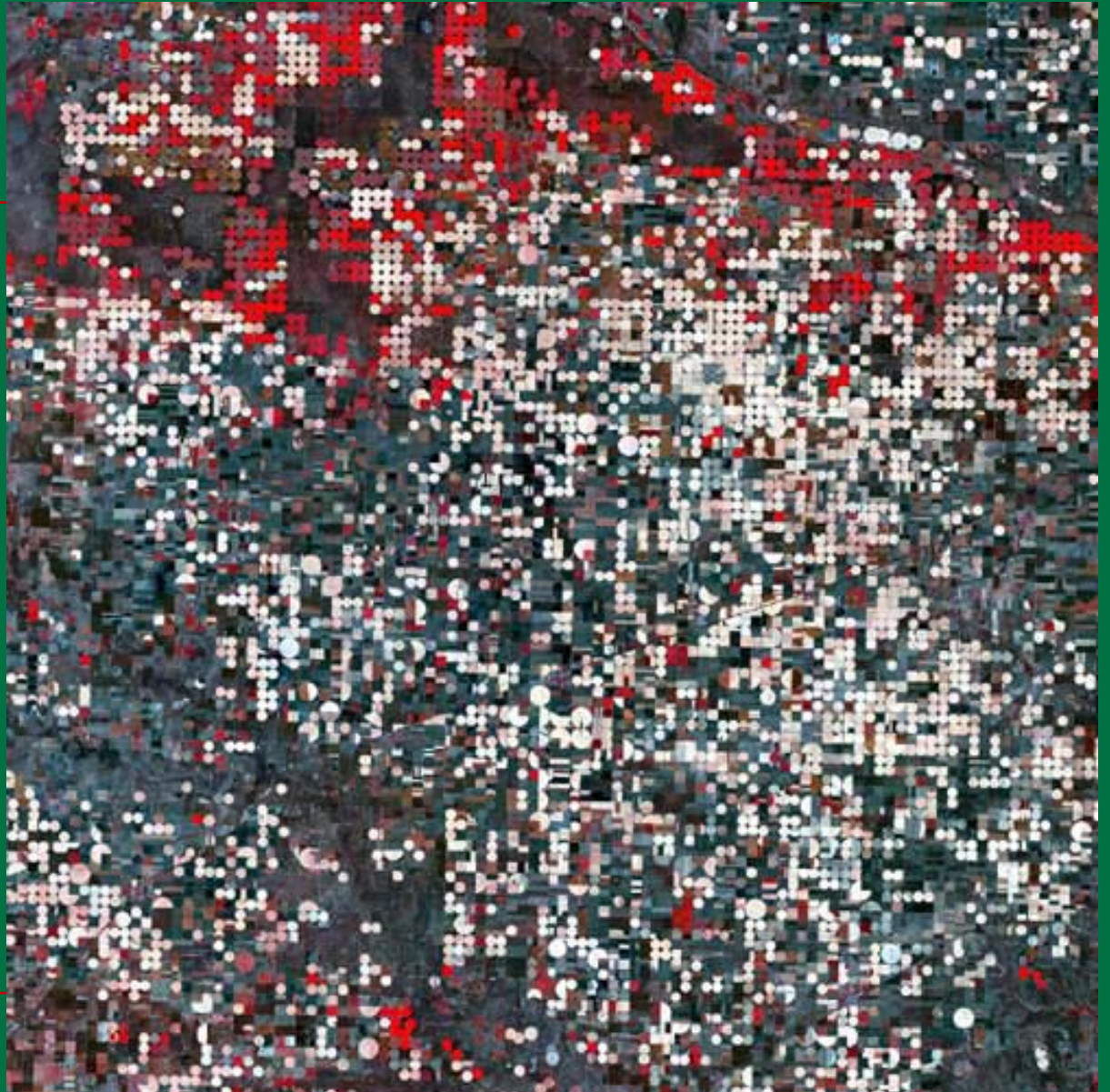
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# Garden City, Kansas

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# Relevance

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- Environmental
- Human Health
- Mineral Exploration
- Change Analysis
- Natural and Manmade Hazards
- Urban Dynamics

*Critical to Establish!*

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# Mandate

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- Landsat (ERTS / EROS) Program
- U.S. Global Change Research Program
- **U.S. Public Law 102-555 (1992)**
- U.S. National Space Policy
- Presidential Decision Directive

# Challenges

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- **Maintaining the Funding**
- **Analog**
- **Digital**



# Maintaining the Funding

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- **Continuous Reporting**
- **Strategic Briefings**
- **Published Science**
- **Data Calls**



# Analog

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- Volume
- Environmental Conditions
- Security
- Geographics
- Vinegar Syndrome



# Volume

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- **Over 8 Million Frames**
- **Four Film Types**
- **Multitude of Physical Sizes**

# Environmental Conditions

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- Temperature
- Relative Humidity
- Variability

# Security

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- **Relatively Long Shelf-Life**
  - ☞ Safety Films
- **Off-Site Copies**
- **Tours**
  - ☞ Promotion

# Geographics

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- **Frame-Based Latitudes and Longitudes**
  - ☞ Majority Strip- or Mosaic-Based
- **Contract**
- **\$**

# Vinegar Syndrome

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- **Acetate Films**
  - ☞ Used into the 1960s
- **Affects 20,000 Rolls**
  - ☞ Antarctica
- ***Not If, But When***
- **\$**
- **Identification and Ranking**
- **Mitigation**

# Digital

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- Volume
- Security
- Lifespan
  - ☞ Migrations
  - ☞ Transcriptions



# Volume

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- **Growing Exponentially**
- **Storage & Access Strategies**
  - ☞ **Off-, Near-, Online**
- **Media**
  - ☞ **Hard Disk Versus Tape**
  - ☞ **Trade Studies**



# Security

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- **Relatively Short Shelf Life**
  - ☞ Media, HW, SW Obsolescence
- **Off-Site Copies**
  - ☞ *Reciprocal Archives*
- **Tours**
  - ☞ Promotion

# Lifespan: Migrations

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- Migrating Data From Older to Newer Media
- Straight Forward
- Required
- Low to Moderate Cost

*Clock Ticking ...*

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# Lifespan: Transcriptions

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- Migrating Data and Re-Formatting
- Complex
  - ☞ Requirements / Design / Integration / Operation
- Unique HW / SW
- Required
- Medium to High Costs
- Long Operational Phases



*Clock Ticking ...*

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# Lifecycle

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- **Records Management Approach**
  - ☞ **Creation**
  - ☞ **Maintenance / Use**
  - ☞ **Disposition**
- **Learning Curve**
  - ☞ **Training**
- **Structure**



# Lifecycle: Creation

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- What to Acquire?
- Advisory Committees
  - ☞ Internal
  - ☞ External

# Lifecycle: Maintenance & Use

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- Trade-Offs
- Access
  - ☞ Physical
  - ☞ Via Metadata / Browse
- Preservation
  - ☞ Three Copy Digital Strategy
    - ◆ 1 On-Line
    - ◆ 1 Off-Line
    - ◆ 1 Off-Site

# Lifecycle: Dispositions

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- **The Back Door**
- **More is Better / Turf**
- **Mission**
- **Resources**
- **Advisory Committees**

# Take Home Message

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- Establishing Relevance is Critical
- Analog and Digital Challenges
- Records Management Approach

***Constant Vigilance!***

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