USGS Landsat Data Continuity Mission (LDCM)

User Portal, Data Delivery and Map Services

John Dwyer and Mike Neiers
SAIC & SGT*
US Geological Survey Center for Earth Observations and Science
Sioux Falls, SD

* Work performed under U.S. Geological Survey contract 03CRCN0001

Agenda

- Define what we mean by User Portal?
- What does the Portal provide?
  - Components
- Using OGC web mapping services (WMS) for visualization
- COTS tools for viewing WMS services
- Using OGC web coverage services (WCS) for data distribution
- COTS products for data distribution
- Questions

What do we mean by User Portal?

- Means different things to different people
- For simplicity … defined as an “Information Access” point
- Assumptions:
  - Web-enabled
  - Provides a wide range of capabilities (Discuss these later)
  - Services multiple user ‘types’

Components of User Portal

- Registration
  - Probably can't get around this
  - Use what we currently have with upgrades to security
- Search (Inventory Discovery)
  - Capability to access the entire Landsat database
  - for inventory discover, more flexibility in data mining
  - Identify standards for advance search capabilities - ancillary data, metadata, OLPA, etc..
- Delivery
  - OCG investigation .. Provide only standard delivery of products
    - Investigate feasibility of various image server capabilities
  - Interface w/ EROS current H/C distro system
  - How do we handle Bulk Users & VAR?

Components of User Portal

- Map Display
  - Many currently available .. Virtual Earth, ArcGIS, World Wind, etc…
  - Conduct evaluations and make recommendations (i.e., OGC)
  - Or, we could link to several and let the user use the one they refer?
- Browse
  - Interface w/ Map Display.. Which one?
  - Investigate more flexible ways to visualize imagery (COTs products)
  - Need to identify specifications for browse

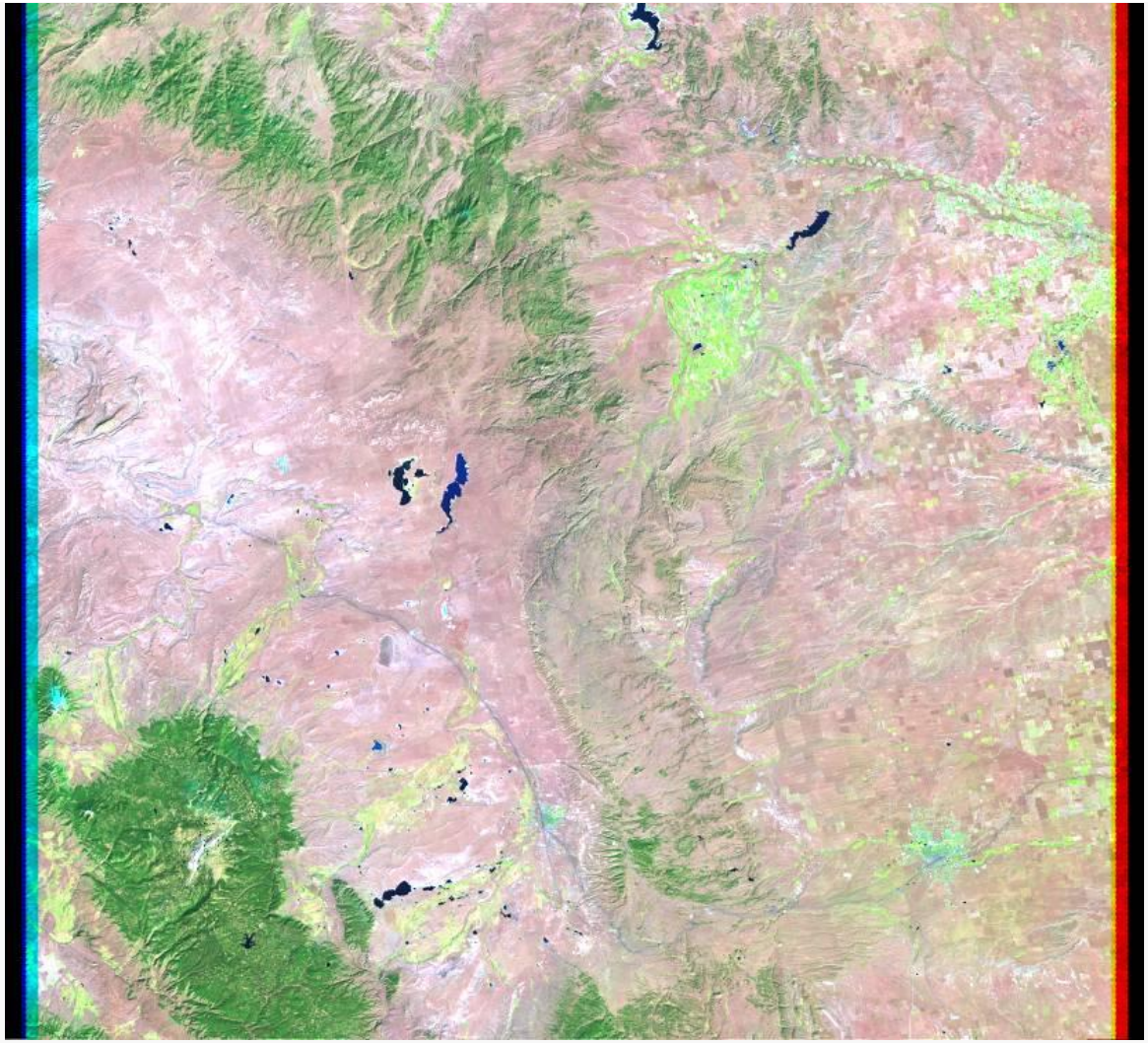
Components of User Portal

- Billing & Accounting
  - Web enabled technology; EBAS current system
  - How does the new ‘no price’ policy affect this?
  - Bulk orders
- Timing of New “User Portal”
  - When do we bring on this enhanced capability?
  - Could use the existing systems through launch and implement post-launch … Allow the latest technology to be utilized
  - Phased implementation
  - Need to decide what our philosophy will be for data access

Using WMS for data visualization

- Investigate the use of OGC Web Mapping Service (WMS) for data visualization
- Replacement for the traditional, fixed size, non-georeferenced, browse image
- Dynamically resampled
- Up to full spatial resolution possible
- Georeferenced, with support for multiple map projections
- Delivery in standard formats (JPEG, PNG, etc)
- One of the most popular OGC standards
  - Many options for client software
- Challenges:
  - Temporal component: how to represent 30+ years of Landsat data
  - Performance: ~ 3,000,000 scenes
  - Static 3-band color composite

Existing Landsat ETM+ browse



Existing Landsat ETM+ browse zoom

WMS 5x5 path row Landsat ETM+

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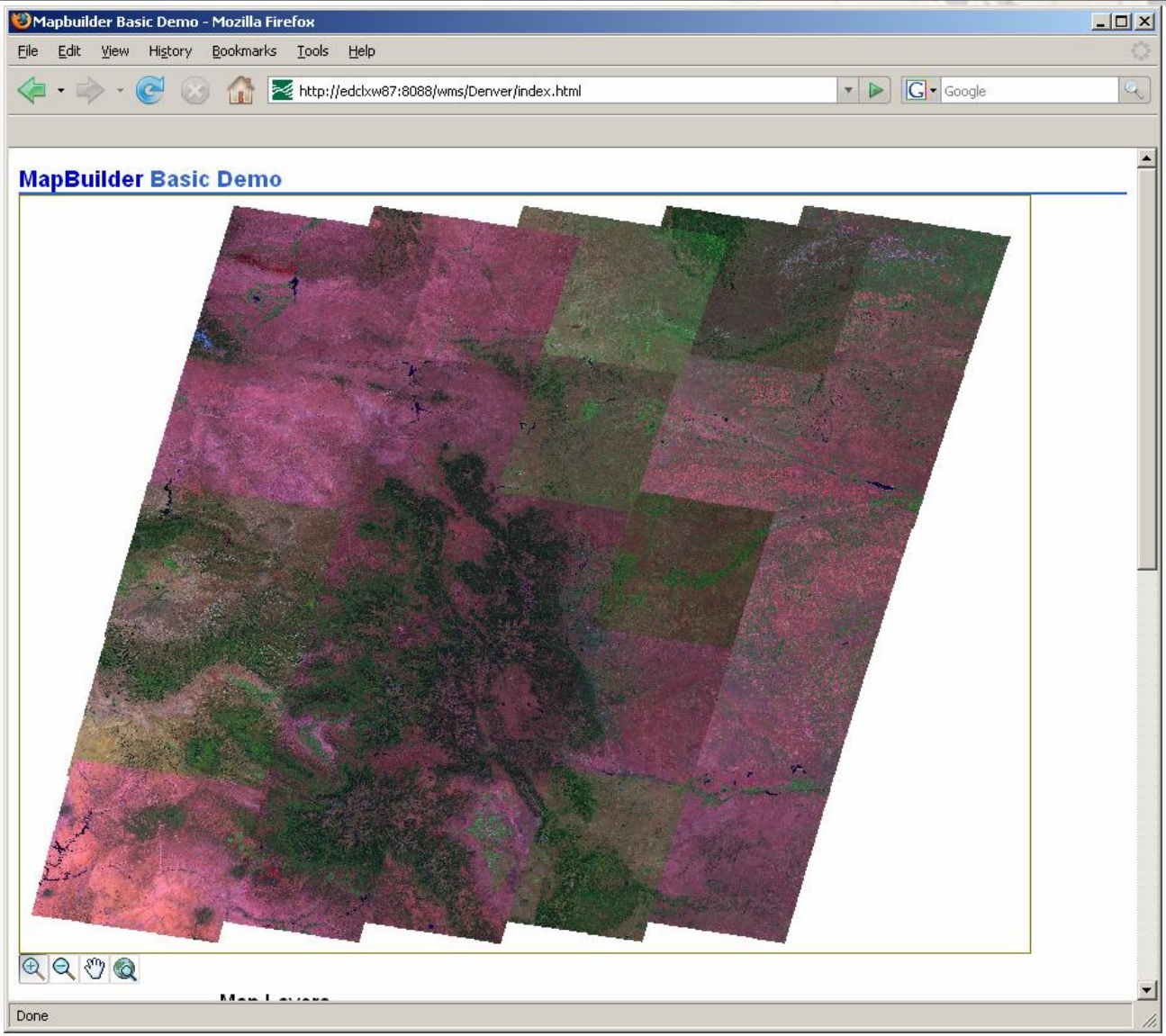
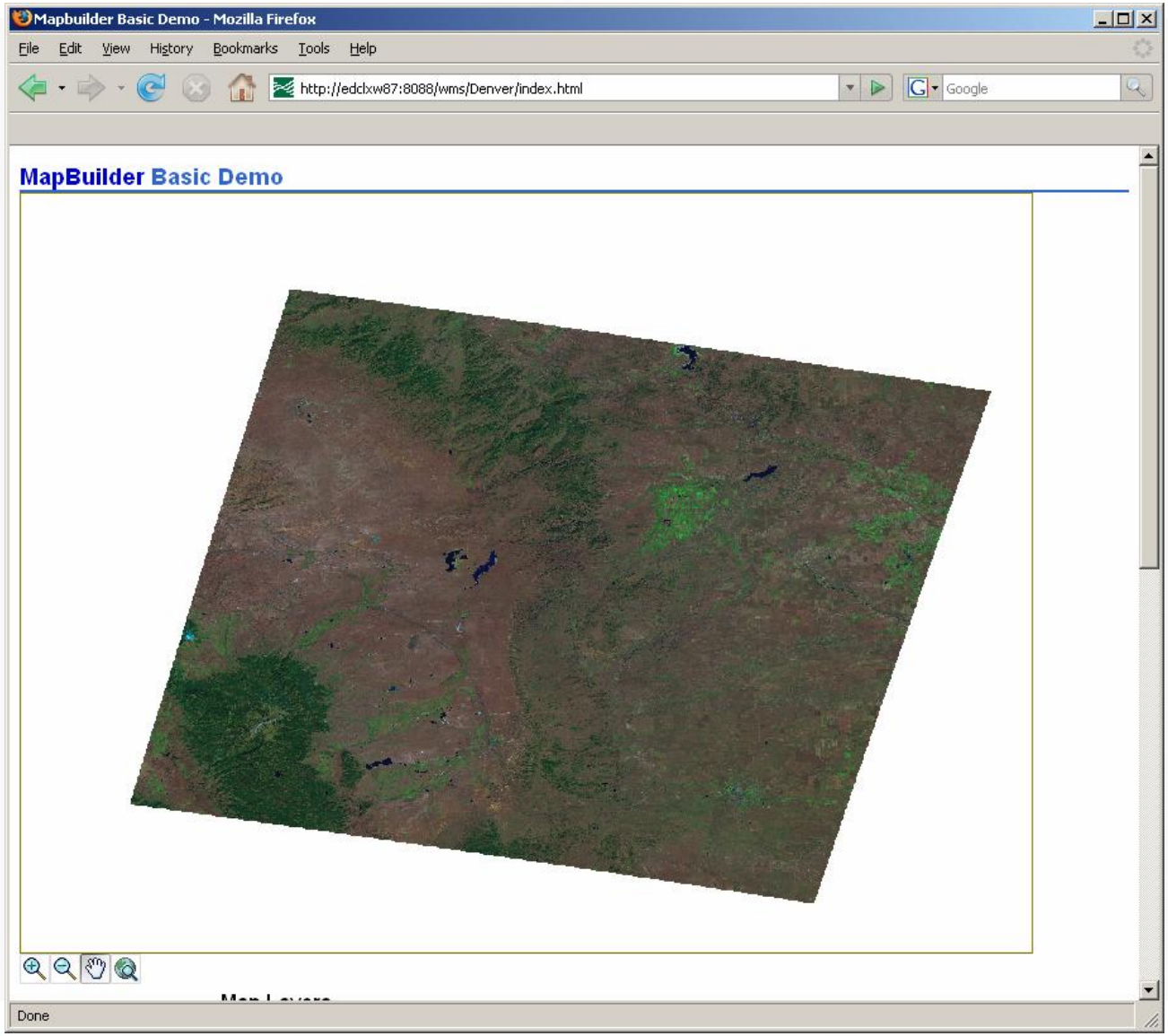


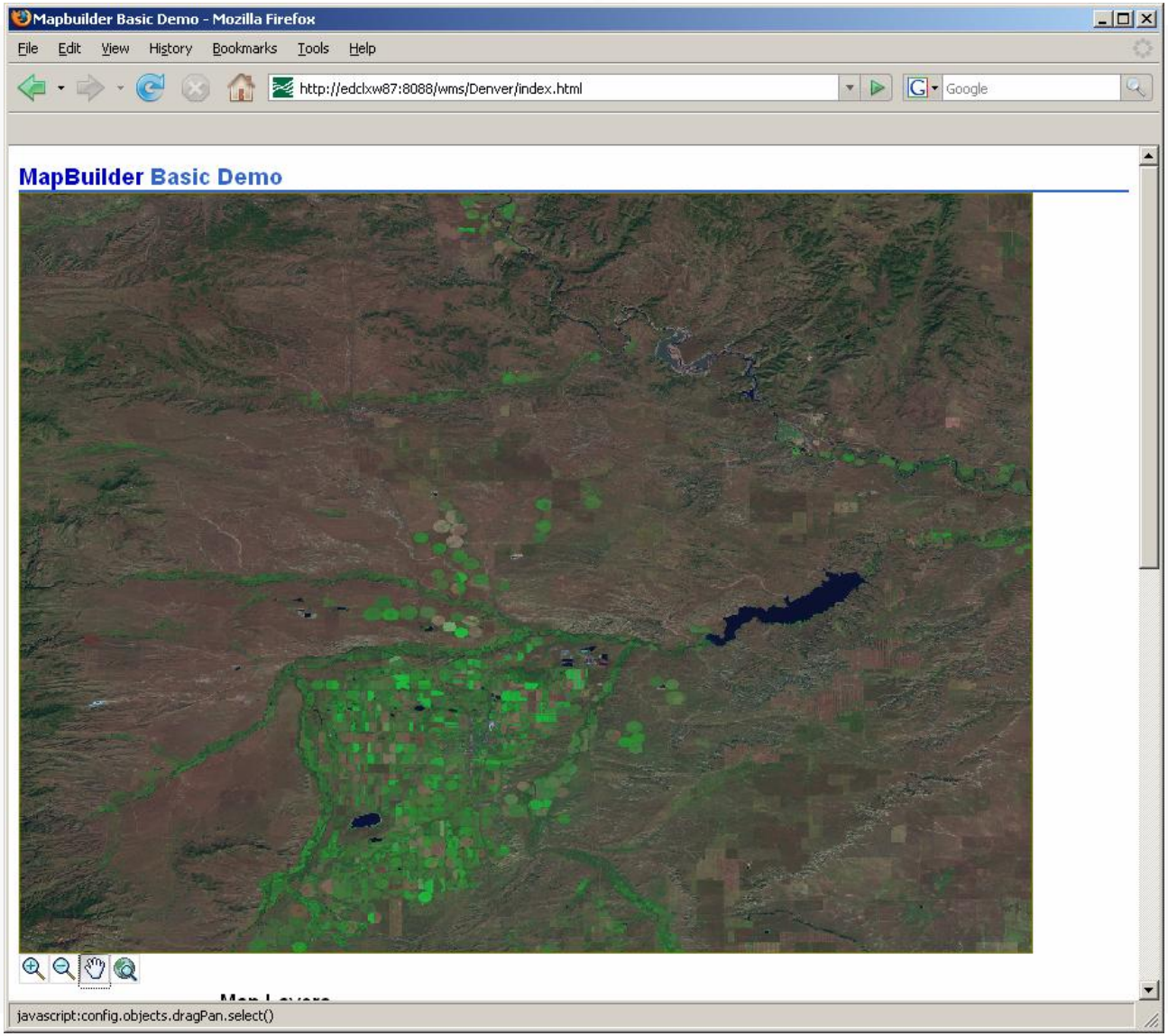
WMS Path 34 Row 31 Landsat ETM+

LDCM



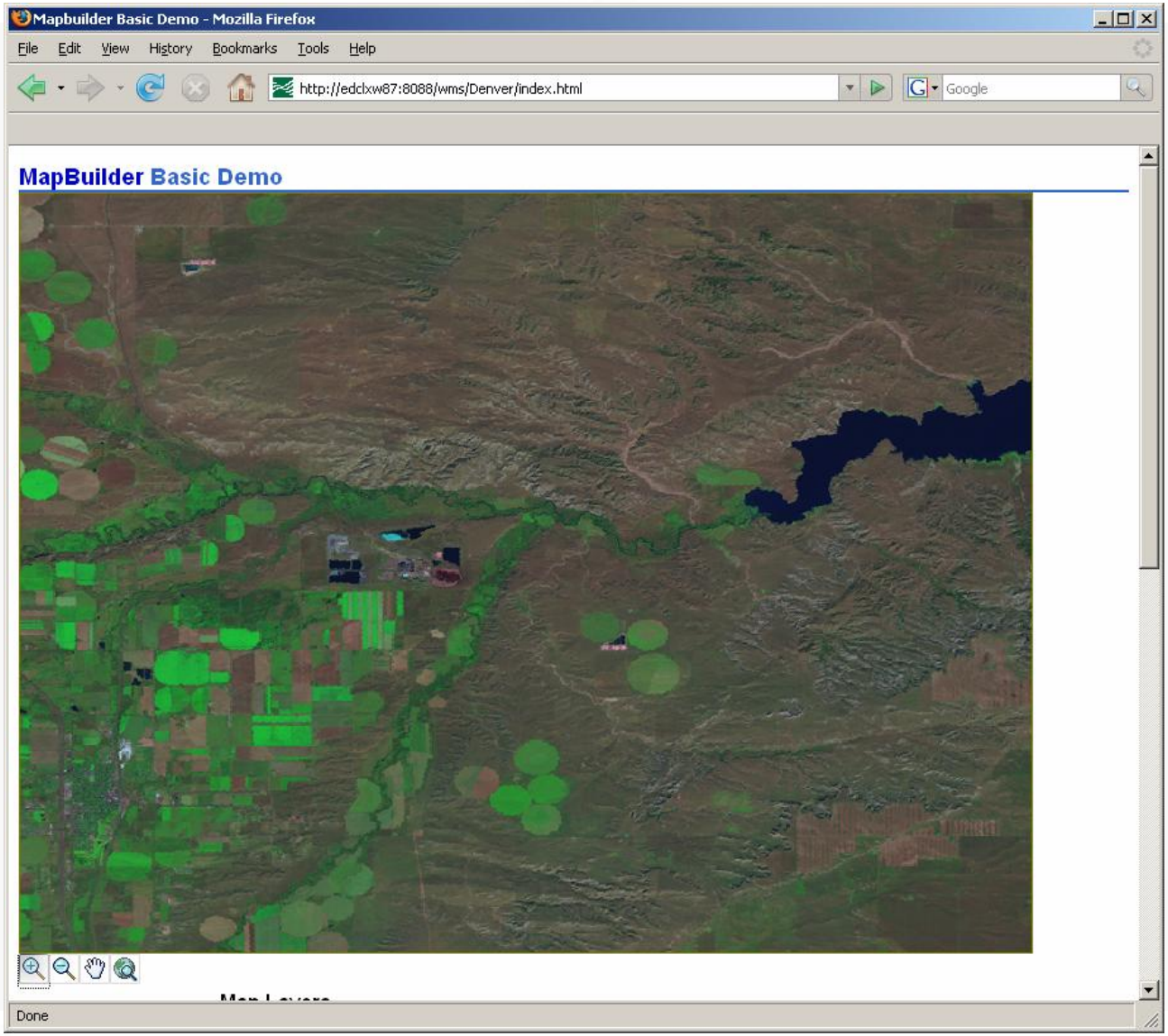
WMS Path 34 Row 31 Landsat ETM+

LDCM



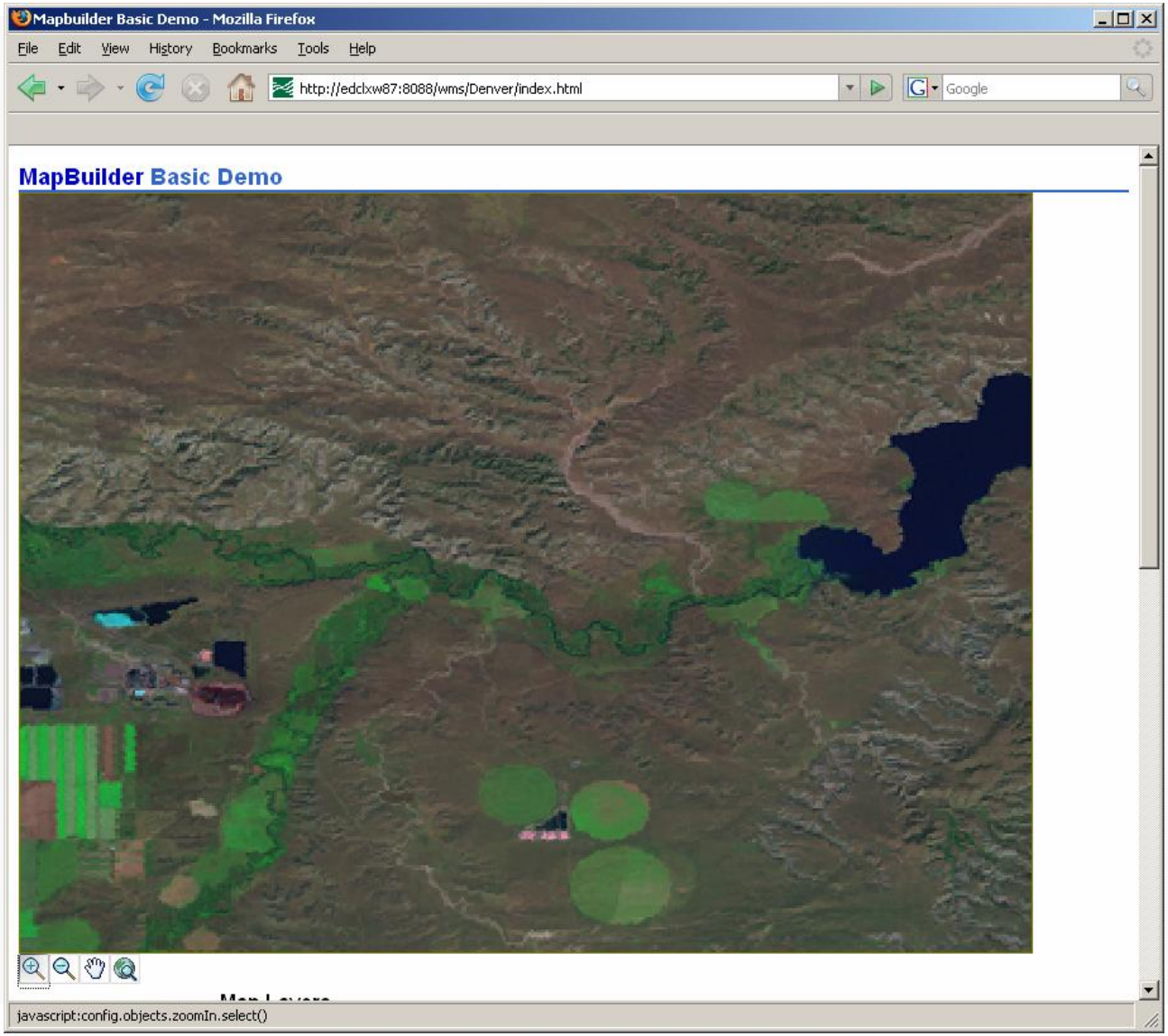
WMS Path 34 Row 31 Landsat ETM+

LDCM



WMS Path 34 Row 31 Landsat ETM+

LDCM



COTS tools for viewing WMS

- GoogleEarth
- ESRI ArcView
- Community map builder (open source)
- OpenLayers (open source)

GoogleEarth

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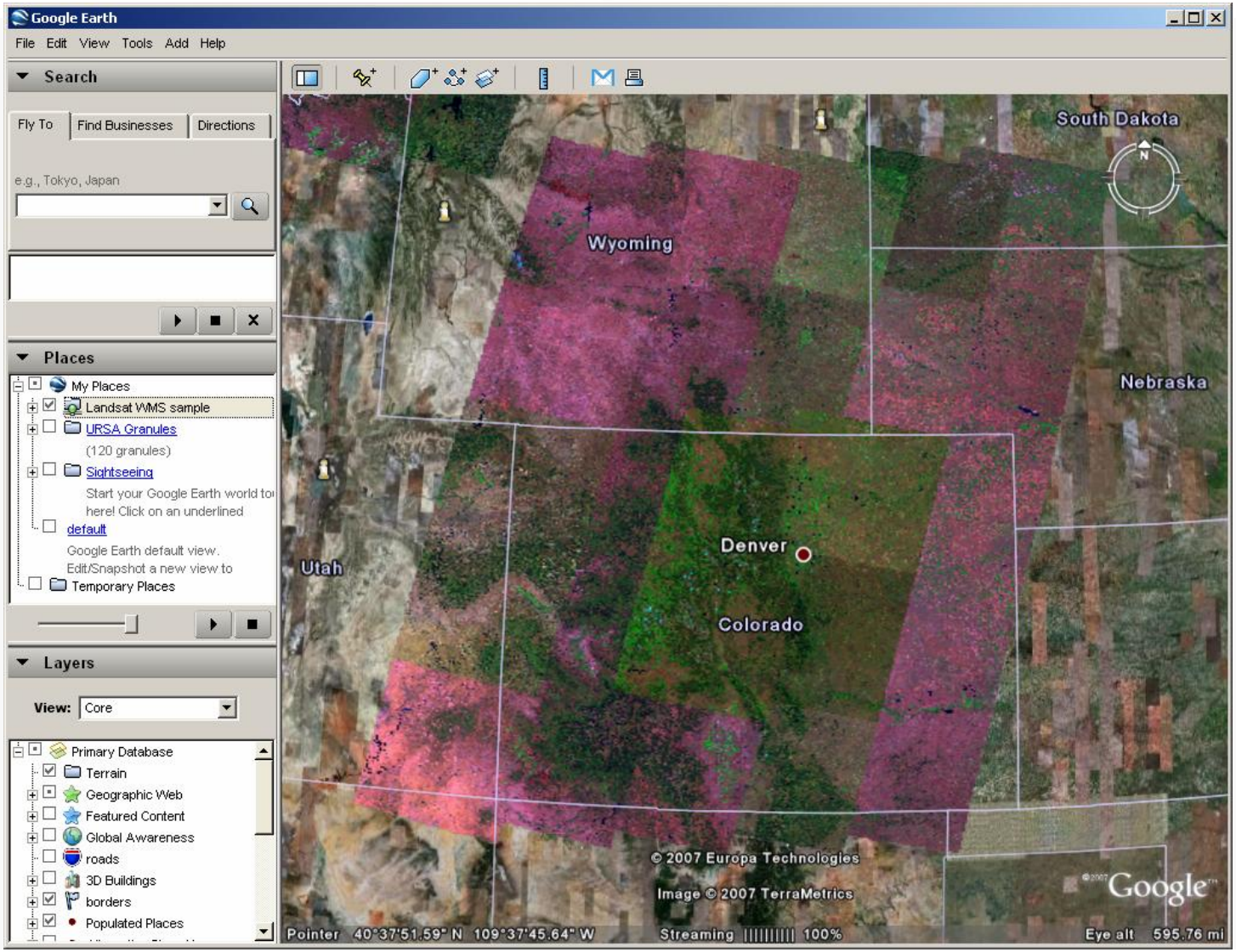
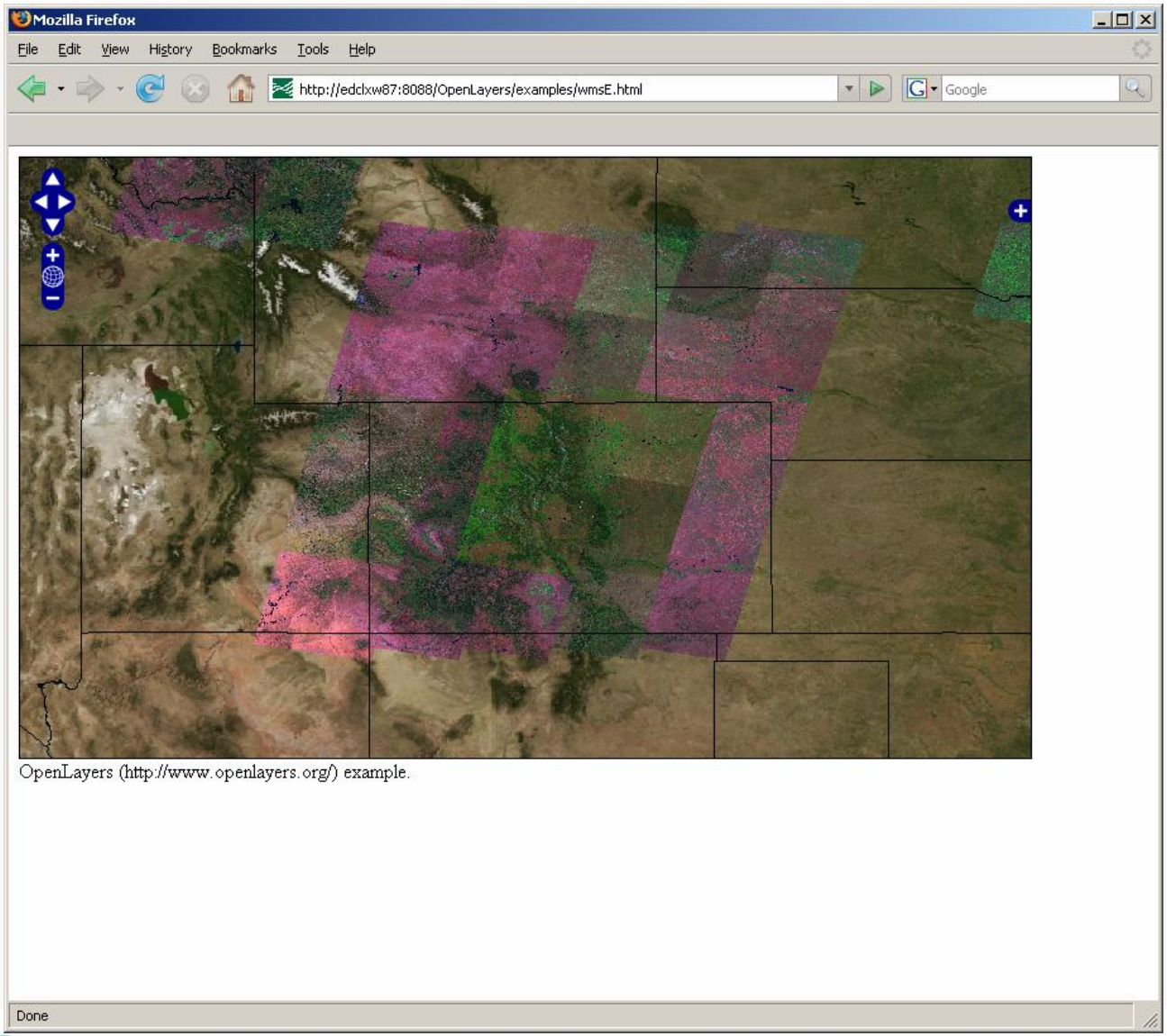


OpenLayers


Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://edclxw87:8088/OpenLayers/examples/wmsE.html
Google
OpenLayers (http://www.openlayers.org/) example.
Done

Using WCS for data delivery

LDCM

- **Investigate the use of OGC Web Coverage Service (WCS) for data delivery**
- **Limits of traditional product download:**
  - Single scene
  - All bands
  - Full spatial resolution
  - Fixed projection
  - Fixed data format
- **Use of WCS for data delivery:**
  - Support for mosaicking multiple scenes
  - Spatial subsetting (limited to rectangular region)
  - Allows reduced resolution
  - Band selection
  - Support for standard data formats (GeoTiff, HDF, etc)
  - Supports temporal search
- **Challenges:**
  - Temporal component: how to represent 30+ years of Landsat data
  - Performance: reprojection/reformatting on a high-volume server
  - Accuracy: how does on-the-fly mosaicking, subsetting, reprojection and format conversion affect the data?
  - WCS is not (currently) as popular as WMS

COTS products for data distribution

- ESRI Image Server
- Ionic Red Spider
- Pixia
- Google Earth Enterprise
- UMN Map Server (open source)

Questions

- Are we on the right track?
- How important are OGC standards?
- Is a data delivery service that offers reprojection/subsetting/resampling/reformatting desirable?
  - Or is simple scene-based file download better? ("leave my data alone")
- Any other comments?