



TerraFly

via Internet2, AMPATH,
and the NAP of the Americas

NASA Regional Applications Center

at Florida International University





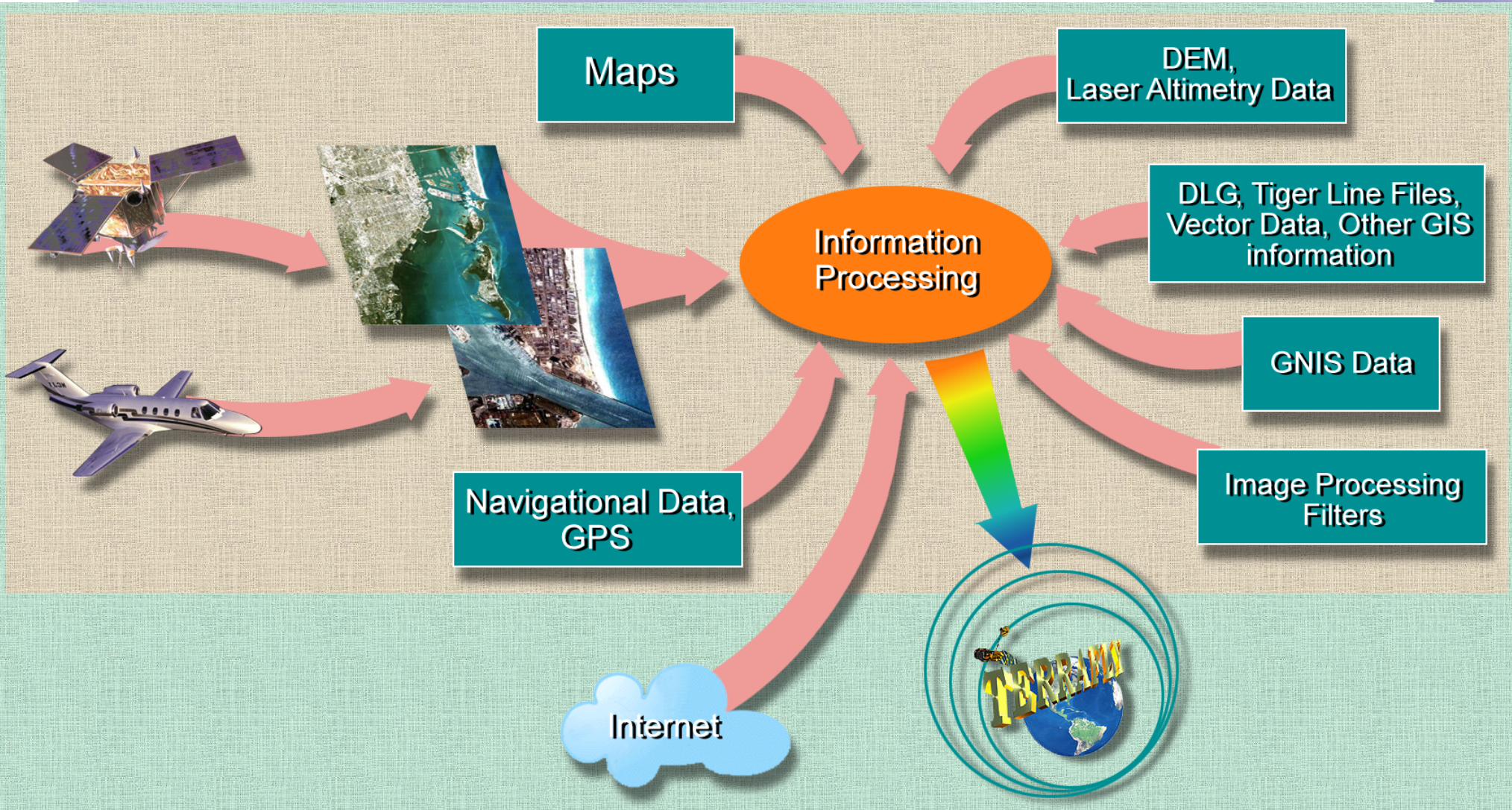
NASA Regional Applications Center at FIU (RAC)

- Facilitate Remote Sensed data to public/private organizations
- Provide/Develop Algorithms for image analysis
- Develop software to assist in large imagery handling
- Match the public's needs to remote sensed data and applications





TerraFly: Our Flagship Application





Cooperative Research and Development Agreement (CRADA)

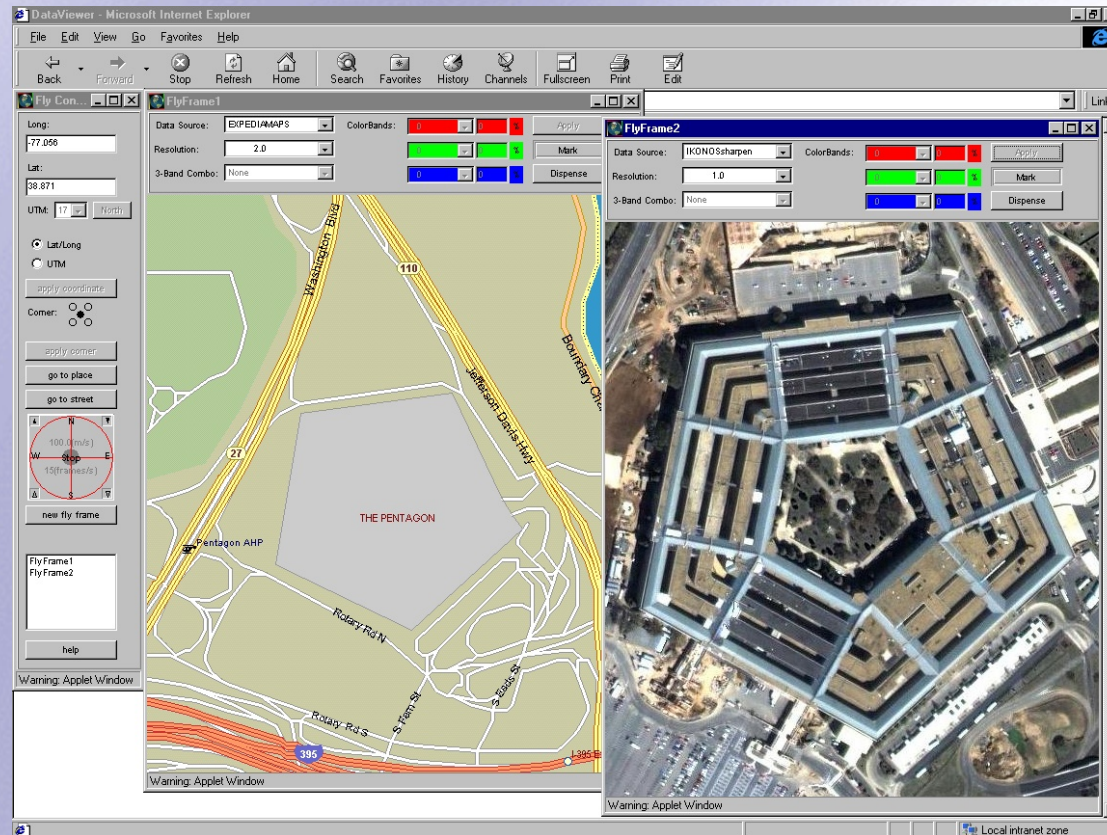


- HPDRC and FIU NASA RAC have entered a CRADA with the USGS to provide users with on-line access to USGS data.
- CRADA project will use new technologies and standards to make archived and newly acquired data, far more accessible to the public.
- Under CRADA, FIU will add aerial photography, Landsat 7 images, and other types of USGS data to the TerraFly Web site.
- Additions could make TerraFly one of the largest collections of publicly-available data on the WWW .





Smooth Flight Over Spatial Data



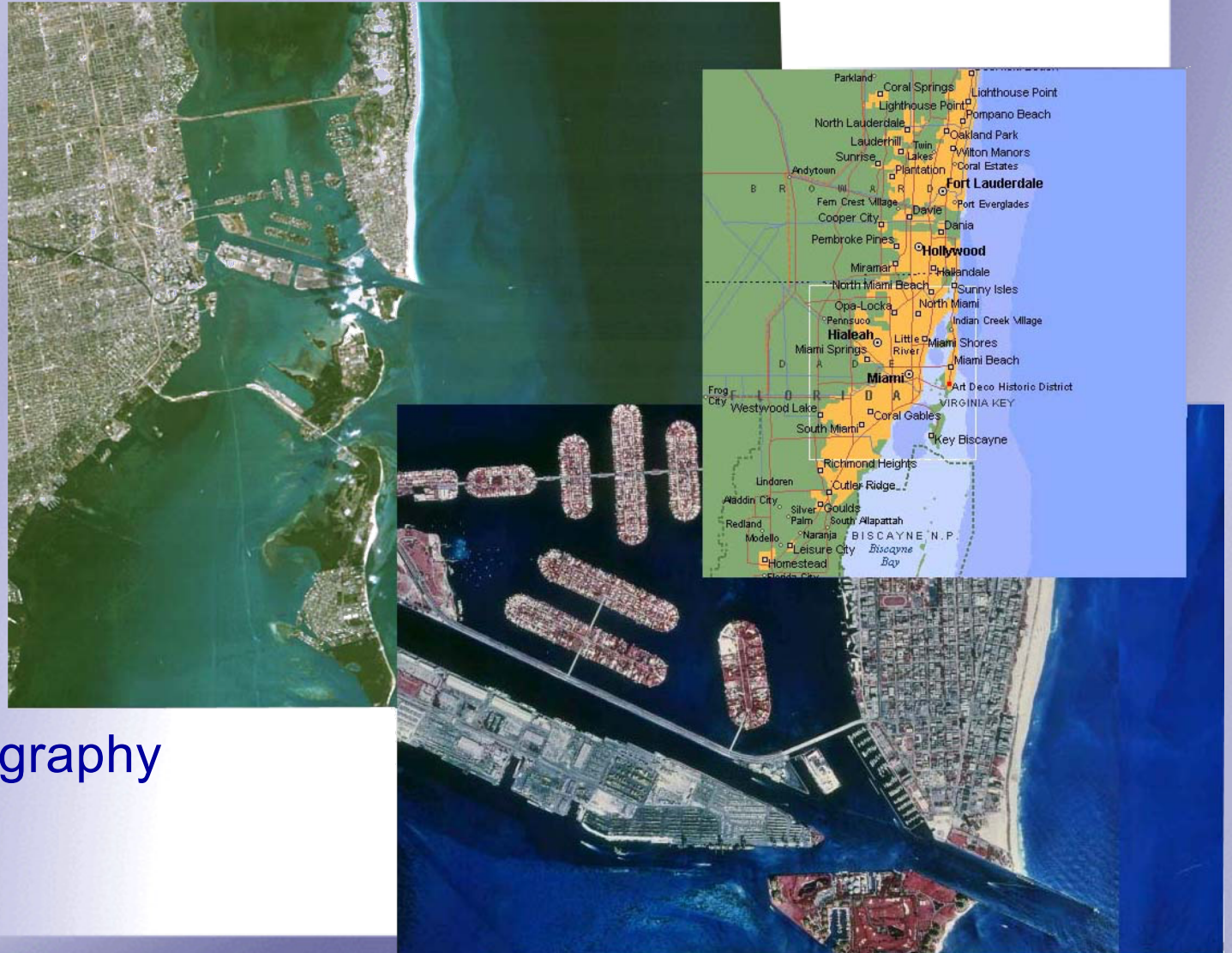
- Data is mosaicked during preprocessing
- Our proprietary algorithm allows for efficient data retrieval from any DBMS





Multiple Data Type Support

- IKONOS
- Landsat
- IRS
- Maps
- GNIS
- US Census
- Aerial Photography
- and more...





Multiple Windows

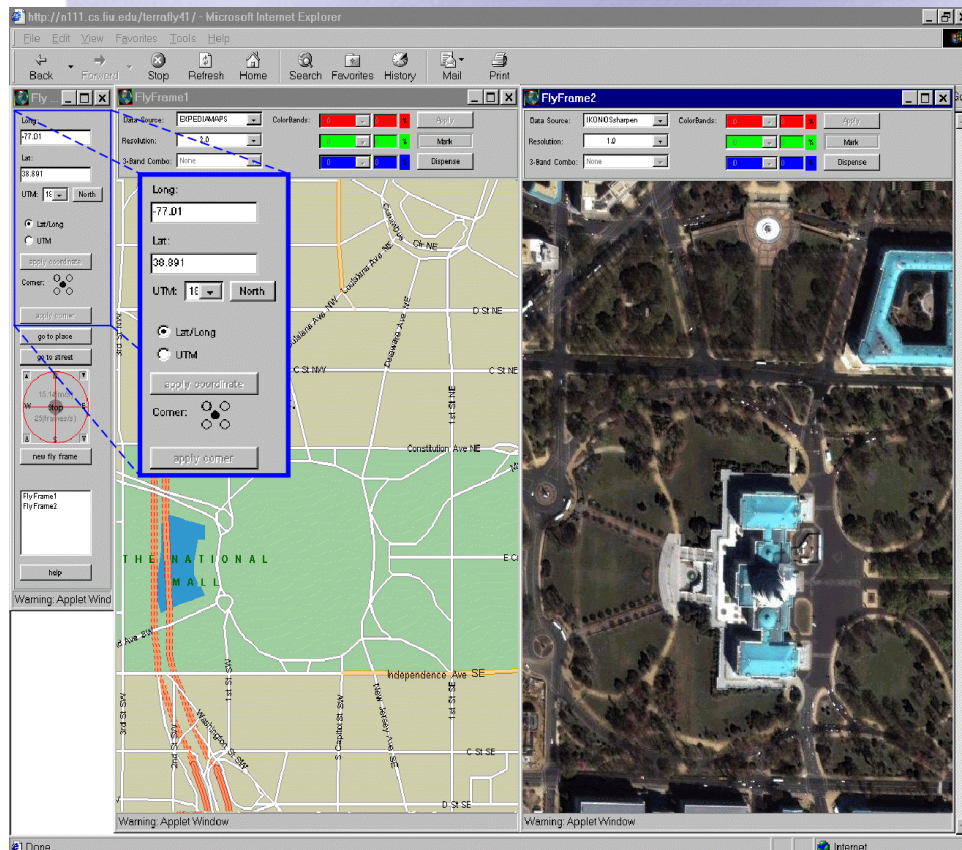
The screenshot shows a Microsoft Internet Explorer browser window titled "DataViewer - Microsoft Internet Explorer". The browser's address bar contains "Fly Con...". The main content area is divided into three frames, each displaying a different map view:

- FlyFrame1:** Displays a street map from "EXPEDIAMAPS". The "Data Source" is "EXPEDIAMAPS", "Resolution" is "8.0", and "3-Band Combo" is "None". The map shows a grid of streets including West, Alton Ct, Meridian Ave, 14th St, 13th St, 12th St, 11th St, 10th St, 9th St, 8th St, 7th St, 6th St, 5th St, 4th St, 3rd St, 2nd St, 1st St, and Biscayne St. A yellow line highlights a path through the streets.
- FlyFrame2:** Displays a satellite map from "HPORCAP". The "Data Source" is "HPORCAP", "Resolution" is "8.0", and "3-Band Combo" is "None". The map shows a detailed aerial view of a coastal urban area with buildings, roads, and a large body of water.
- FlyFrame3:** Displays a satellite map from "LANDSATNV". The "Data Source" is "LANDSATNV", "Resolution" is "28.5", and "3-Band Combo" is "None". The map shows a wide view of a coastal area with a large body of water, a long pier, and surrounding land.

On the left side of the browser window, there is a control panel for the maps. It includes fields for "Esat:" (586827.381), "North:" (2850064.247), and "UTM:" (17). There are radio buttons for "Lat/Long" and "UTM", and buttons for "apply coordinates", "Corner:", "apply corner", "go to place", and "go to street". A speedometer graphic shows "509.5 (m/s)" and "10 (frames/s)". There are also "help" and "new frame" buttons. At the bottom of the control panel, there is a "Warning: Applet" section.



Geolocation ID

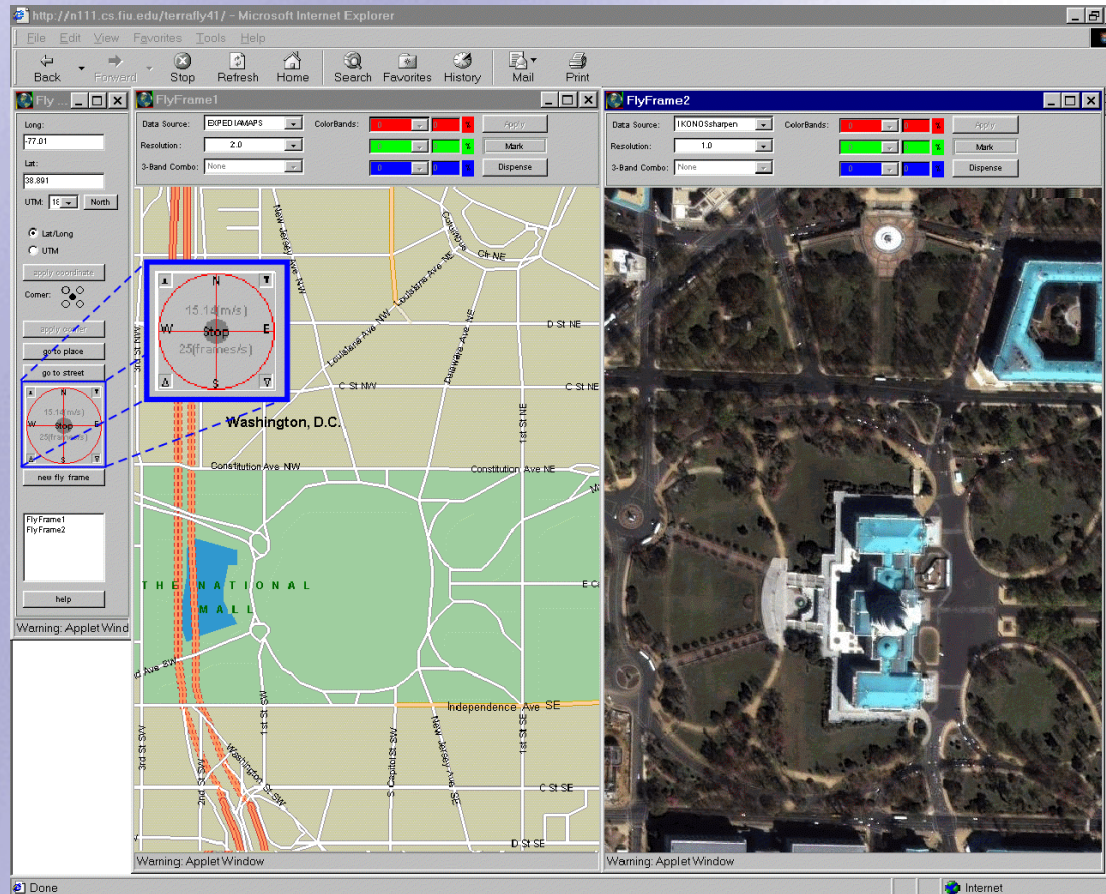


- Updates the image's geographical coordinates as you "fly"
- Provides a Go-To Coordinate feature
- Choice of 5 point-of-interest locations for the displayed coordinates





Compass Control Tool



- Control your flight speed, direction and refresh rate with the click of the mouse

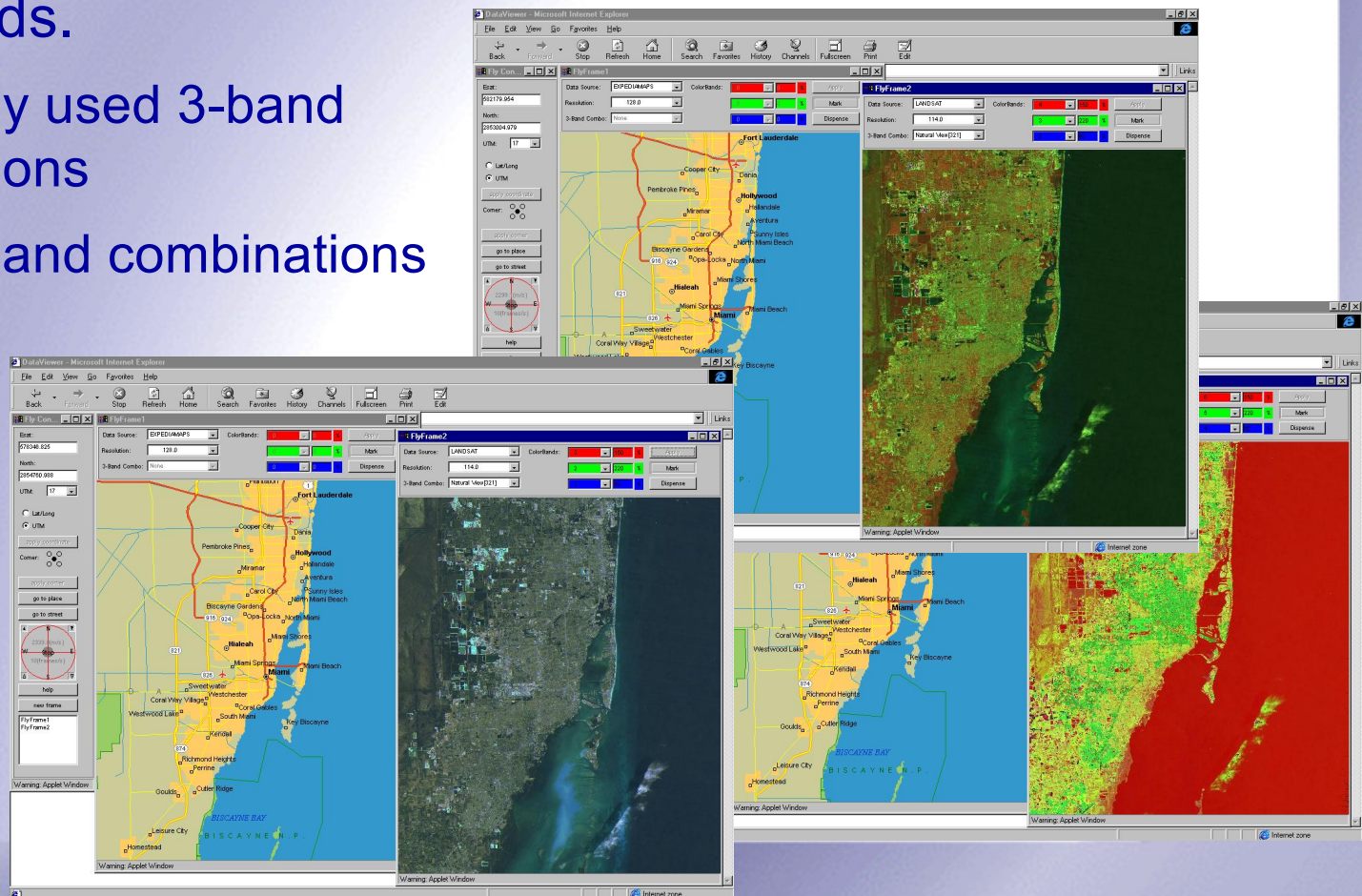




Spectral Band Control

Provides the user with the capability to create false-color images on-the-fly by combining spectral bands.

- Commonly used 3-band combinations
- Custom band combinations





Go-To Place

The screenshot shows a web browser window titled "DataViewer - Microsoft Internet Explorer". A "GotoPlace" dialog box is open, displaying a search table with columns: Longitude, Latitude, Distance, Placename, County, State, and Place. The table lists 17 results, with the Pentagon at the top. Below the table are buttons for "Query", "OK", and "Close". To the right of the dialog is a map control with "ColorBands" and "Mark" options. The main map area shows a satellite view of the Pentagon building. At the bottom left, there is a smaller map showing a street grid with labels like "Virginia Highlands" and "Aurora Hills".

	Longitude	Latitude	Distance	Placename	County	State	Place
1	77.056	38.871	0.068	Pentagon	Arlington	VA	buildi
2	77.074	38.888	0.513	Henderson Hall	Arlington	VA	buildi
3	77.035	38.876	0.71	US Park Police Headquarters - East Potomac Park	District of Columbia	DC	buildi
4	77.072	38.882	0.726	Hoffman Boston Community Center	Arlington	VA	buildi
5	77.034	38.876	0.728	National Capital Parks Headquarters	District of Columbia	DC	buildi
6	77.077	38.878	0.772	Arlington County Fire Station Company 10	Arlington	VA	buildi
7	77.068	38.859	0.829	Hume Museum	Arlington	VA	buildi
8	77.068	38.859	0.832	Arlington Historical Museum	Arlington	VA	buildi
9	77.032	38.878	0.847	East Potomac Maintenance Building	District of Columbia	DC	buildi
10	77.027	38.875	0.848	US Park Police - East Potomac Park	District of Columbia	DC	buildi
11	77.059	38.857	0.885	Aurora Hills Community Center	Arlington	VA	buildi
12	77.061	38.857	0.89	Fire Station Company 5	Arlington	VA	buildi
13	77.073	38.881	0.893	Custis Lee Mansion	Arlington	VA	buildi
14	77.043	38.882	0.912	United States Department of the Interior Museum	District of Columbia	DC	buildi
15	77.088	38.865	0.928	Columbia Pike Library	Arlington	VA	buildi
16	77.032	38.881	0.978	National Capital Parks Central Headquarters	District of Columbia	DC	buildi
17	77.086	38.882	0.992	Fire Station Company 1	Arlington	VA	buildi

● Go-To a specific place of interest using its name



Place Identifier

- Find the closest place of interest and populated place
- Find the exact coordinates of any point in the image, even during flight

The screenshot shows a web browser window titled "DataViewer - Microsoft Internet Explorer" displaying a map application. The main map area shows a street grid in Washington, D.C., with labels for "Dupont Circle", "THE NATIONAL MALL", "Franklin Park", and "Washington, D.C.". A red line indicates a flight path or zoom sequence. A "This Point" dialog box is open over the map, displaying the following data:

X:	324290.99
Y:	4306657.72
Zone:	18
North:	true
Longitude:	-77.03
Latitude:	38.89
Distance:	0.01
Placename:	National Museum of Natural Hist
Placetype:	building
Distance_PPL:	0.39
Placename_PPL:	Washington
County:	District of Columbia
State:	DC

The interface includes a left sidebar with coordinate input fields (Long: 177.026, Lat: 38.89, UTM: 18 North) and buttons for "apply coordinate", "apply corner", "go to place", "go to street", and "new fly frame". The top of the browser window shows standard navigation buttons (Back, Forward, Stop, Refresh, Home, Search, Favorites, History, Channels, Fullscreen, Print, Edit) and a menu bar (File, Edit, View, Go, Favorites, Help). The bottom status bar indicates "Internet zone".



Street Address Lookup

The screenshot shows a web application interface for street address lookup. The main window is titled "DataViewer - Microsoft Internet Explorer". The interface includes a search bar, a map, and a "GotoStreet" dialog box. The "GotoStreet" dialog box contains the following information:

Street Address: 1600 Pennsylvania Avenue
City: Washington DC
State: Zip Code:

StreetAddress	City	State and Zip	Longitude	Latitude
1			78.995	38.918

The interface also includes a "Fly Con..." panel on the left with coordinates (Long: -77.037, Lat: 38.897) and a "FlyFrame1" panel with data source "EXPEDIAAMAPS" and resolution "8.0". A "FlyFrame2" panel shows data source "IKONOSsharpen" and resolution "1.0". A "Warning: Applet Window" is visible at the bottom.

- Find the coordinates and Go-To a specific street address



Zoom-In/Zoom-Out

A collage of five screenshots of the DataViewer application, demonstrating zoom-in and zoom-out capabilities. Each screenshot shows a different resolution level of the same satellite imagery, with the resolution value (e.g., 0.0, 4.0, 2.0, 1.0) displayed in the interface. The interface includes a menu bar, a toolbar, and various control panels for coordinates, data source, and color bands. A globe icon is visible in the bottom right corner of the collage.

● View data at different resolutions using our Zoom feature



Data Delivery Capabilities

- Select an area of interest with our easy to use GUI
- Receive the data in your choice of file format and media

A screenshot of a web browser window titled "DataViewer - Microsoft Internet Explorer". The browser displays a map of Washington, D.C. with a red box highlighting a specific area of interest. A "Dispense" dialog box is open, showing coordinates and options for file format and resolution. The dialog box contains the following information:

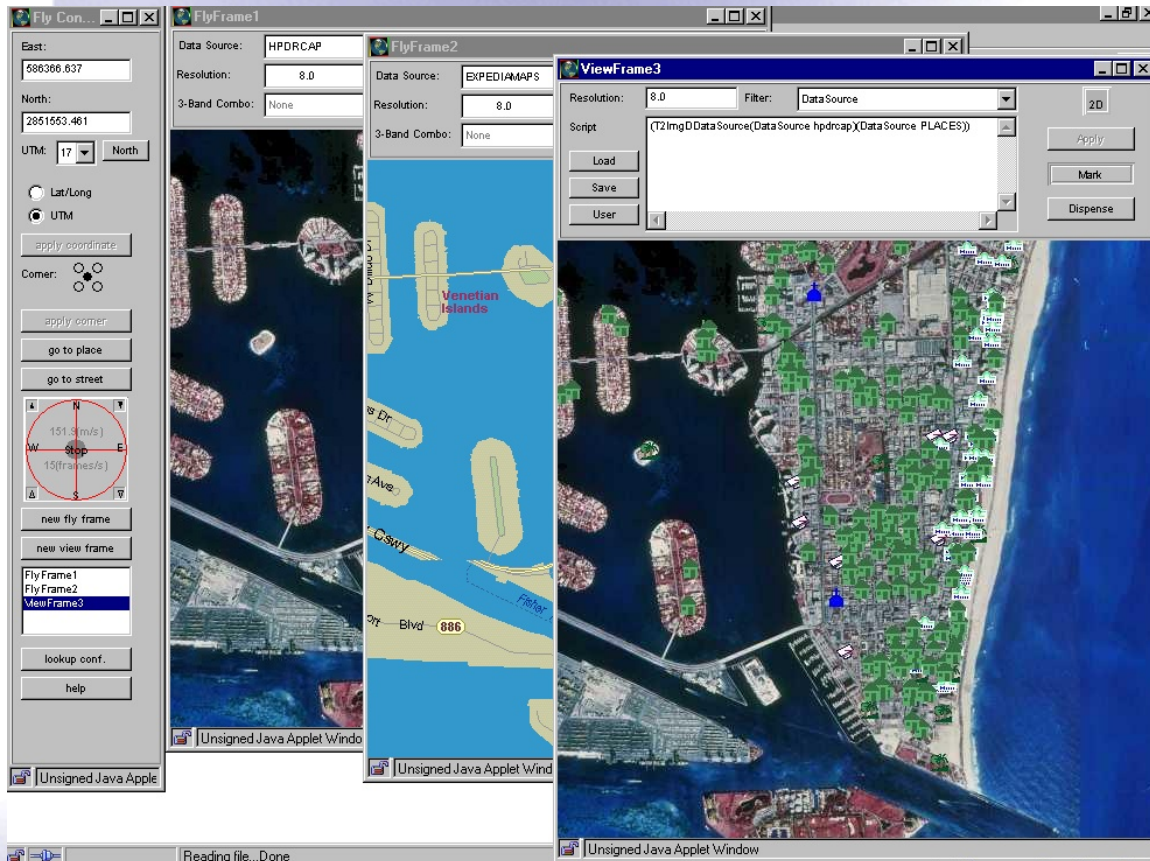
X UpperLeft:	323344.32620502013
Y UpperLeft:	4306694.920668615
Utm UpperLeft:	18
X BottomRight:	322992.8186030753
Y BottomRight:	4306344.547096017
Utm BottomRight:	18
Resolution:	1.0
Image Type:	JPG

The dialog box also includes "Next", "OK", and "Cancel" buttons. The browser window shows a map of Washington, D.C. with a red box highlighting a specific area of interest. The map includes labels for "THE NATIONAL MALL", "FRANKLIN PARK", "EAST POTOMAC PARK", and "EAST POTOMAC GOLF COURSE". The browser window also shows a "Warning: Applet Window" message.



Information Overlay

- Features from the DB can be highlighted
- Data can be overlaid with different sources



airport



hotel



beach



park



church



real estate



hospital

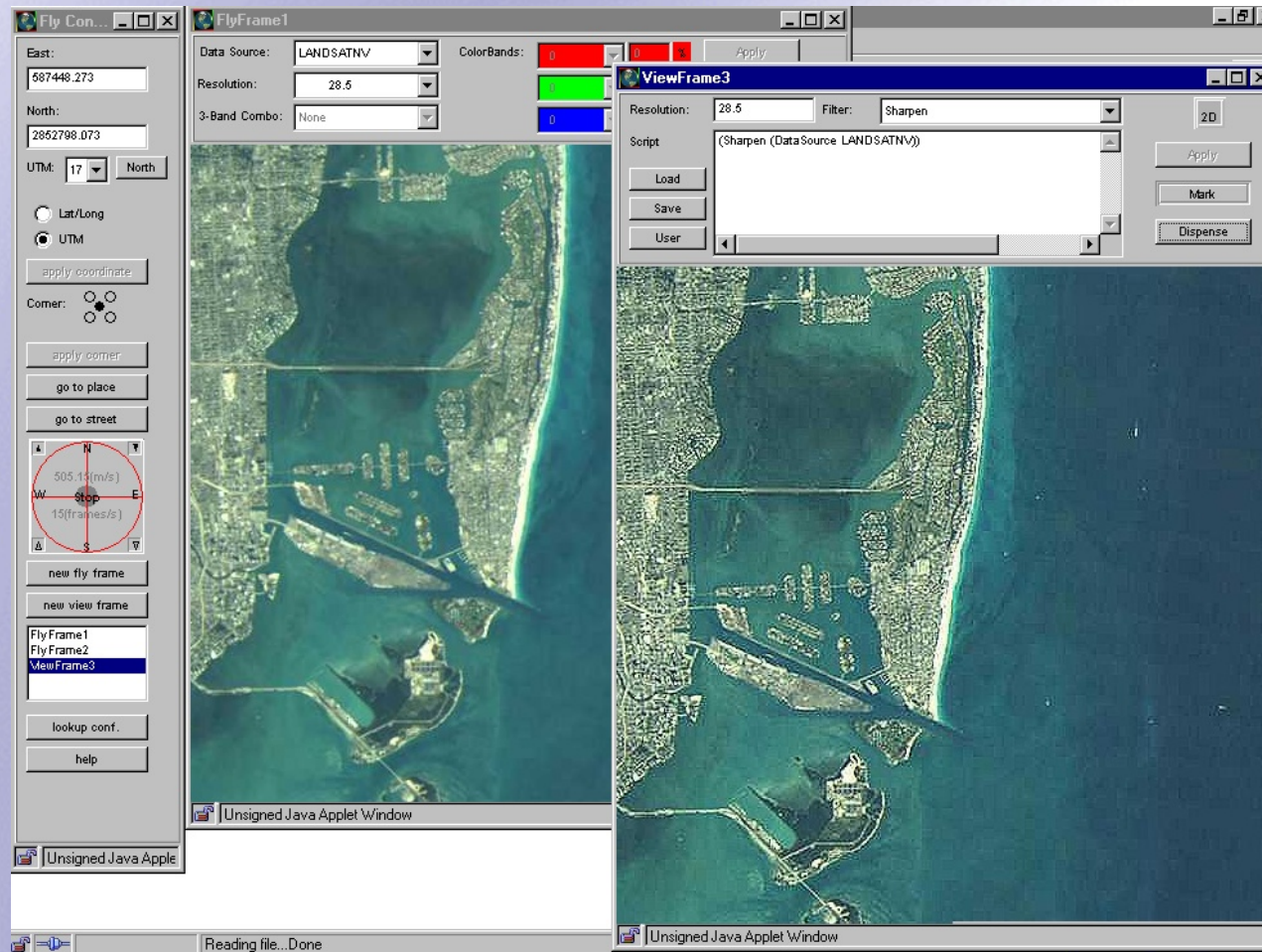


school





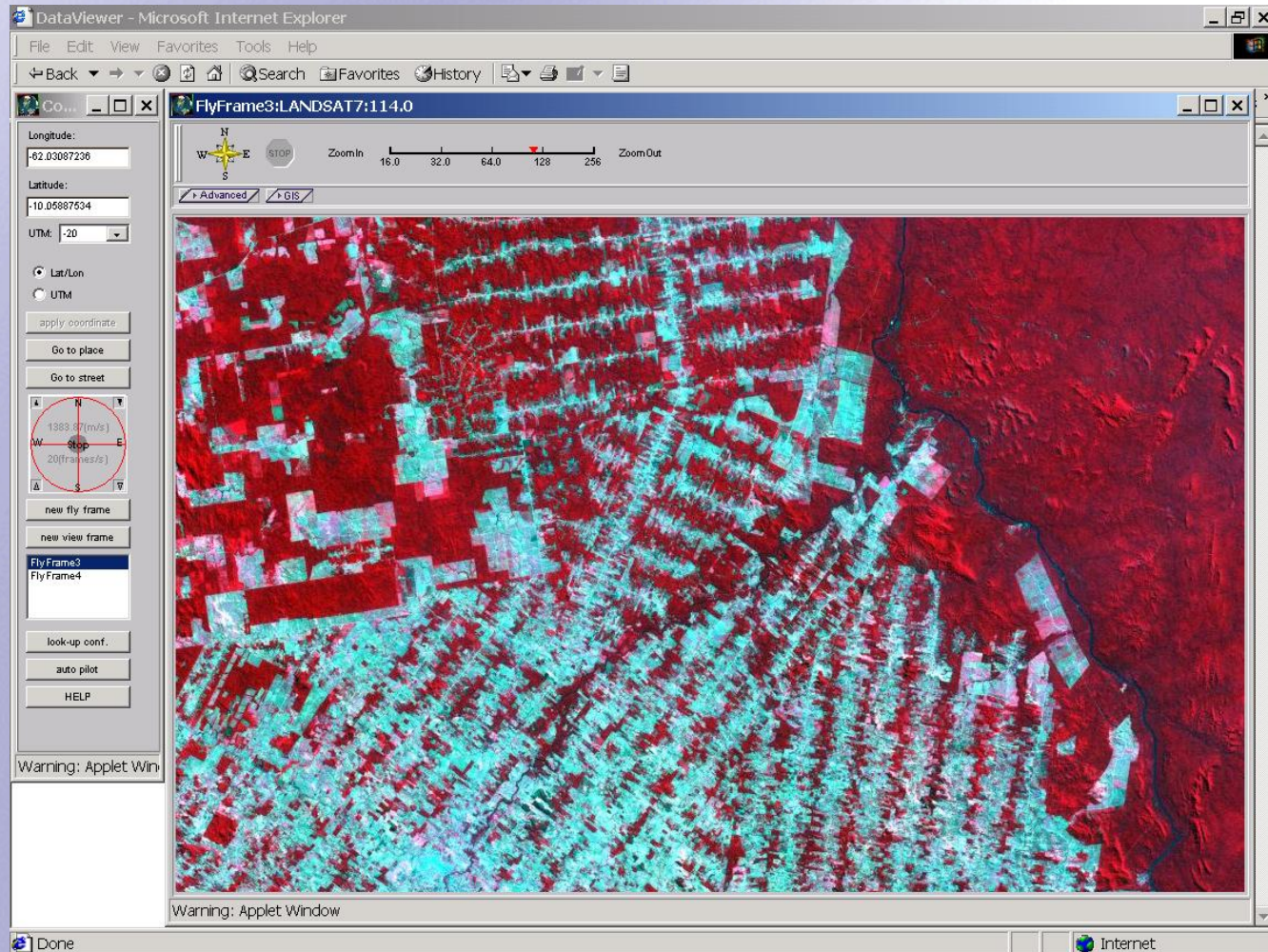
Image Processing Filters



- Image Filters available to enhance image/features



New TerraFly GUI



Infrared image over North-East Rondonia, Brazil



TerraFly Collaborators

- US Geological Survey
achieved 33 Mbps sustained data rate
- NASA
- NSF
- IBM





Project Status

- TerraFly online at <http://TerraFly.fiu.edu>
- Bandwidth intensive application
- High bandwidth client = positive TF experience
- AMPATH will enhance the TerraFly experience to South and Central America clients
- Complete US coverage with 1 Year, Global landmass to follow

