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Abstract

Since the early eighties, IGN, hosting the ITRF product center, has maintained a database archiving site information where space geodesy techniques are operating. This database currently contains up to 2700 sites and more than 2900 points with DOMES numbers as a unique identification. This database can be consulted on line at <http://itrf.ensg.ign.fr>.

The current tools have been upgraded thanks to a cartographic server. A GIS application devoted to this database query, has been developed thanks to Mapserver software.

This tool can be used for:

- Educational purpose: The maps of the different ITRF versions can be displayed with a simple click. Technique by technique maps are available as well as the full network map, with or without ITRF velocities in any ITRF since ITRF96.
- Database query: The site/point information is easily displayed. Point description, point acronyms and tie information on the site are notably available.
- Point selection: The request of ITRF coordinates is simplified by a graphical point selection tool. Coordinates at any epoch can be computed and exported in full SINEX files (or simple table) in any ITRF version for which point coordinates have been computed.

Introduction

The International Terrestrial Reference Frame (ITRF) Web site is devoted to the broadcasting of all ITRF products. ITRF solutions, from ITRF94 to ITRF2005, are available for download as SINEX files (station positions and velocities as well as their full variance-covariance matrix) or tables. The relations linking these ITRS realisations are available as transformation parameter tables. These parameters can be used to transform data expressed in older ITRS realisations to the newest one. All the local tie data used in the ITRF computations are available for download too.

The request of an IERS DOMES number can also be done on line at http://itrf.ensg.ign.fr/domes_request.php. The information concerning all points having a DOMES number can be found on the Web site and mainly deal with:

- Point approximate coordinates
- DOMES number, site name
- Co-located points and local tie information
- Point acronym (4-character code or CDP code)
- Reference point description.

A link to the site Log is also available for every point being part of the IDS, IVS, ILRS, EUREF or IGS network.

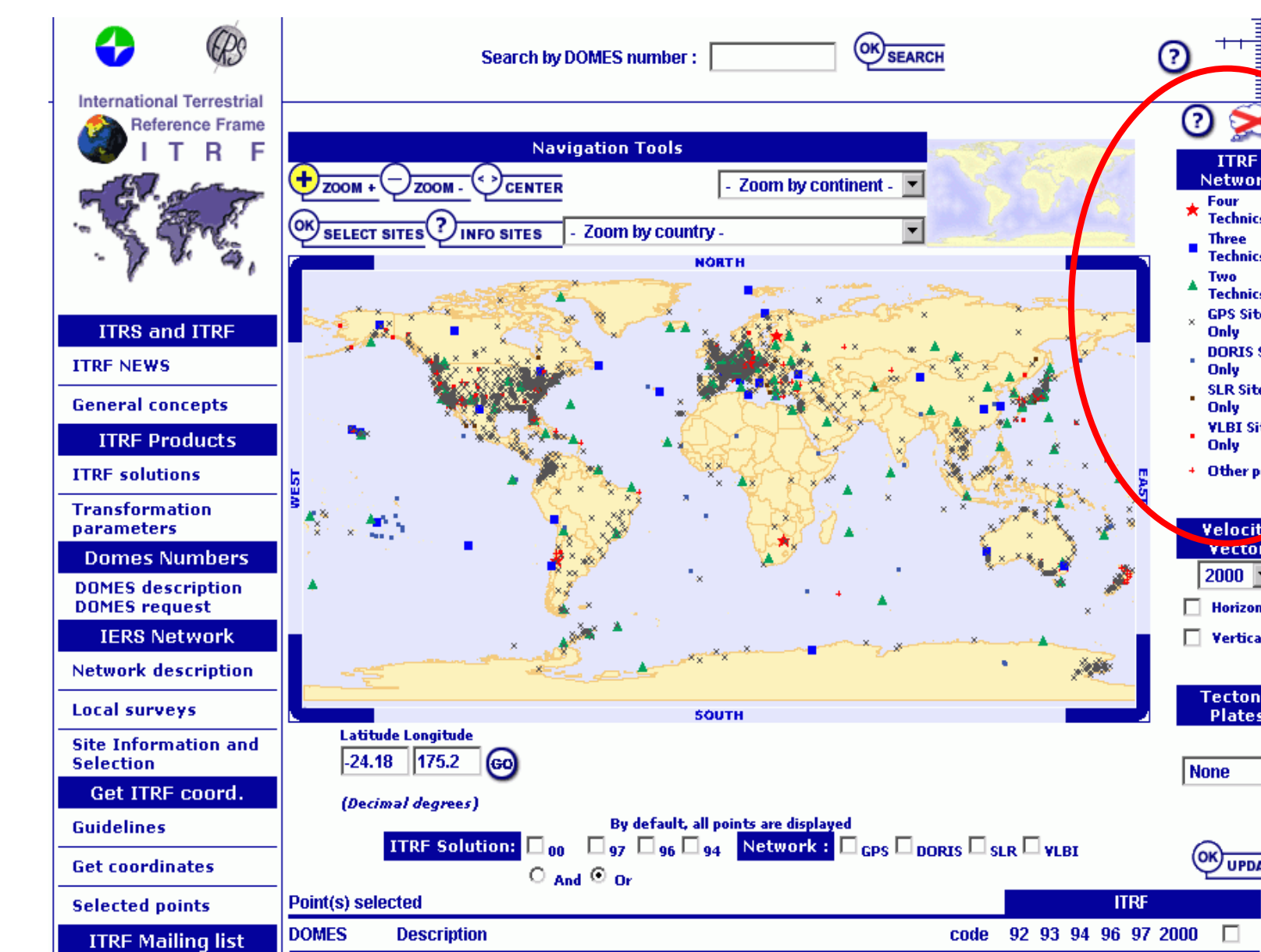
A Geographic Information System (GIS) has been developed to help users finding point information more efficiently. It is based on a PostGIS and Mapserver application and has been developed by engineer students of the "Ecole Nationale des Sciences Géographiques".



Figure 1 : ITRF web site home page

What the GIS can do

Visualization of the full IERS network:

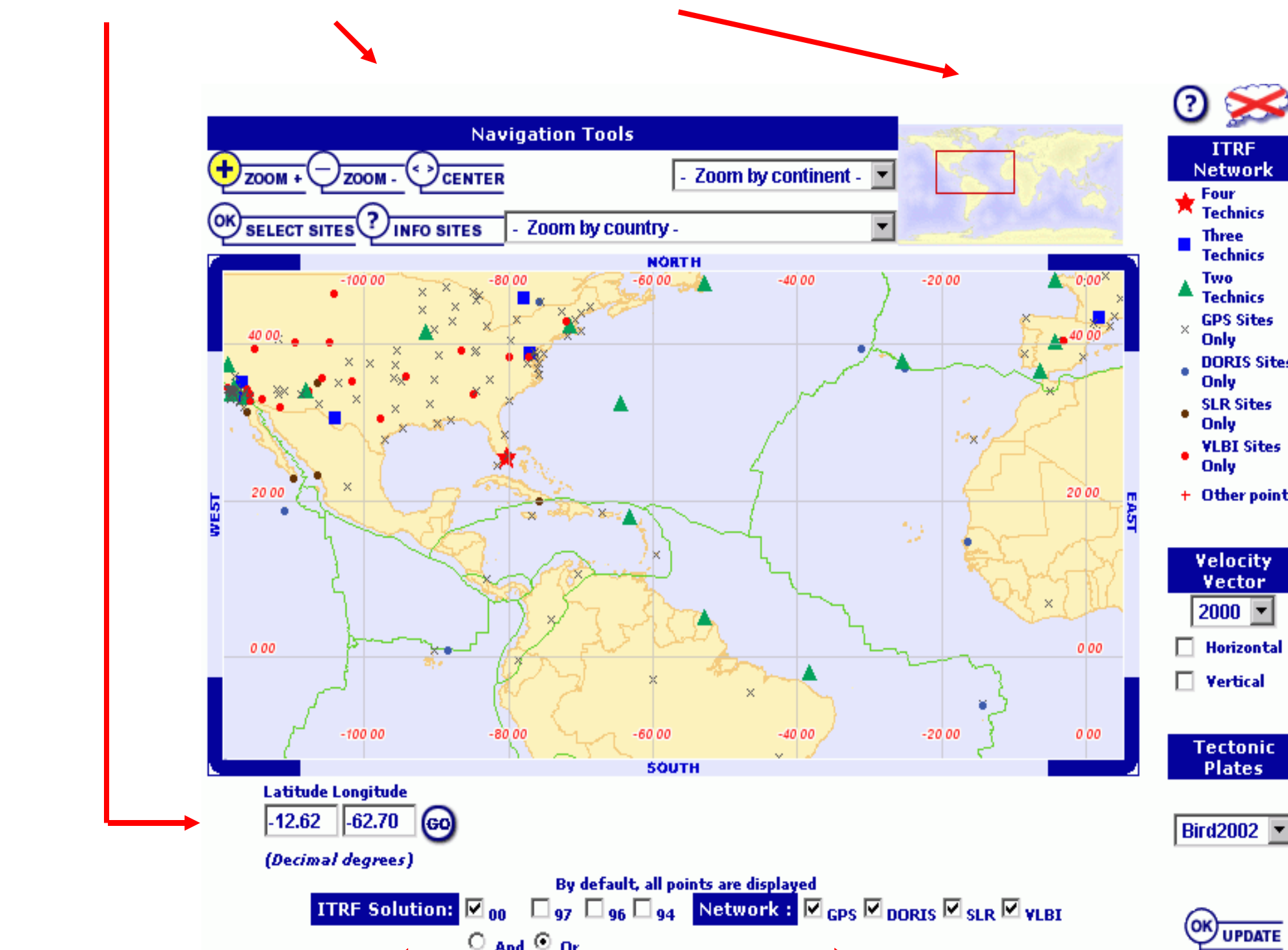


Sites which host measurement techniques are represented on a map. Point measurement technique is displayed when only one type of instrument is located on the site. When several instruments are co-located, the number of techniques is represented.

Figure 2: GIS application. Map of the full network

Choose the network to be visualized:

Use the navigation tool to visualize a specific region



The legend is function of the selected network

Choose the sites for which coordinates have been computed in one or several ITRS realizations

Choose the sites to be displayed in function of their measurement techniques.

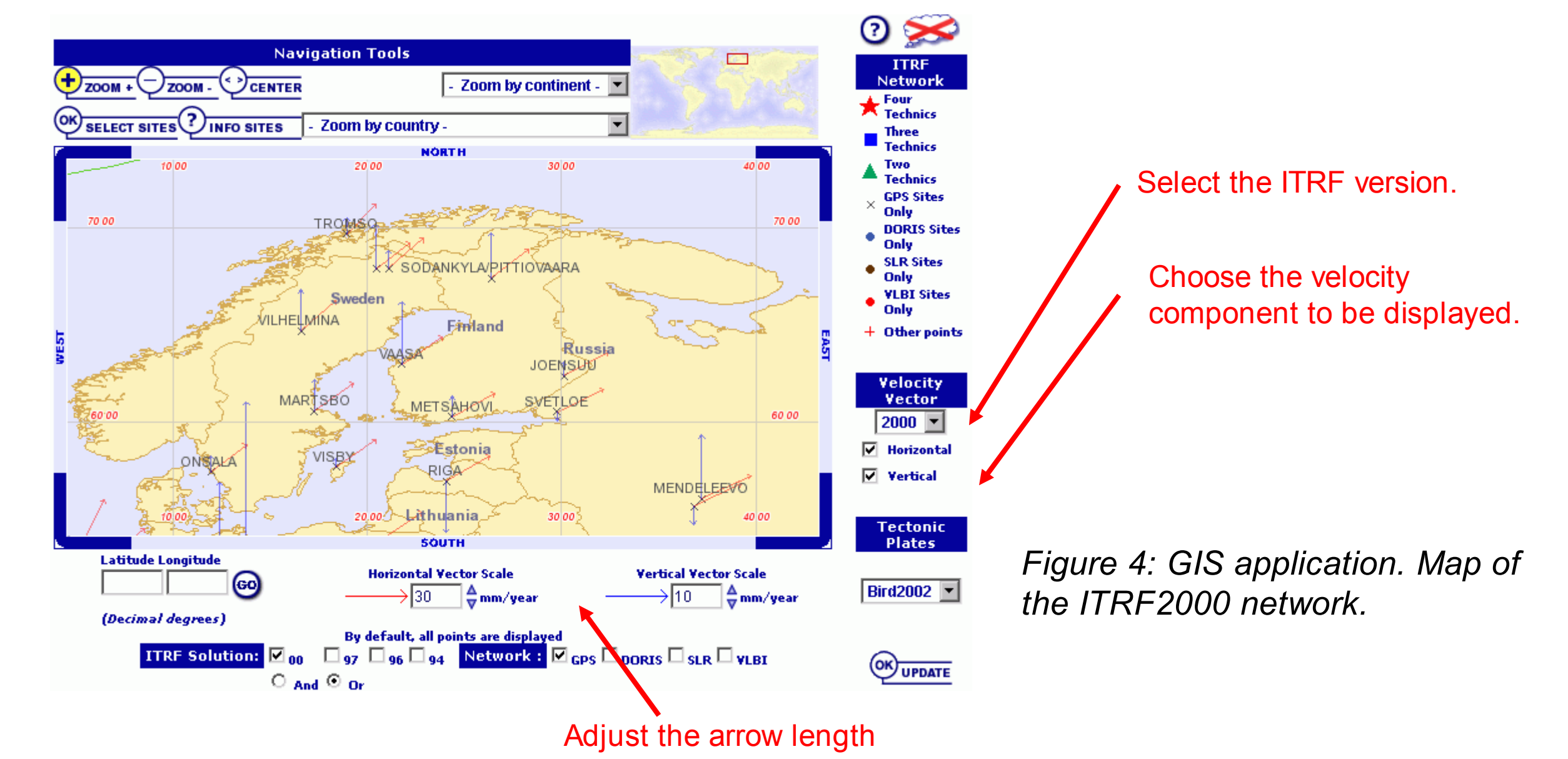
Choose a plate boundary model to be displayed

Consult site information

Click **INFO SITES** button and click on any site on the map. Site description page will be displayed containing: site name, site approximate coordinates, points located on the site, ITRF solution for which point coordinate has been computed, reference point descriptions and local tie information.

Select points you are interested in, and keep them in a cart for precise coordinate request in any ITRF solutions where these specific point coordinates have been processed.

Visualization of the ITRF velocity field :



Select the ITRF version. Choose the velocity component to be displayed.

Adjust the arrow length

Select points for ITRF coordinate request

Click **SELECT SITES** button and select an area by drawing a rectangle. Points of the selected network and located on the selected sites will be added to the cart. An alternative way to select points is to select them from their site description pages.

Get ITRF coordinates of the selected points

Consult at any time the list of selected points

Selected points are displayed on the current map. The list of selected points can be consulted as below:

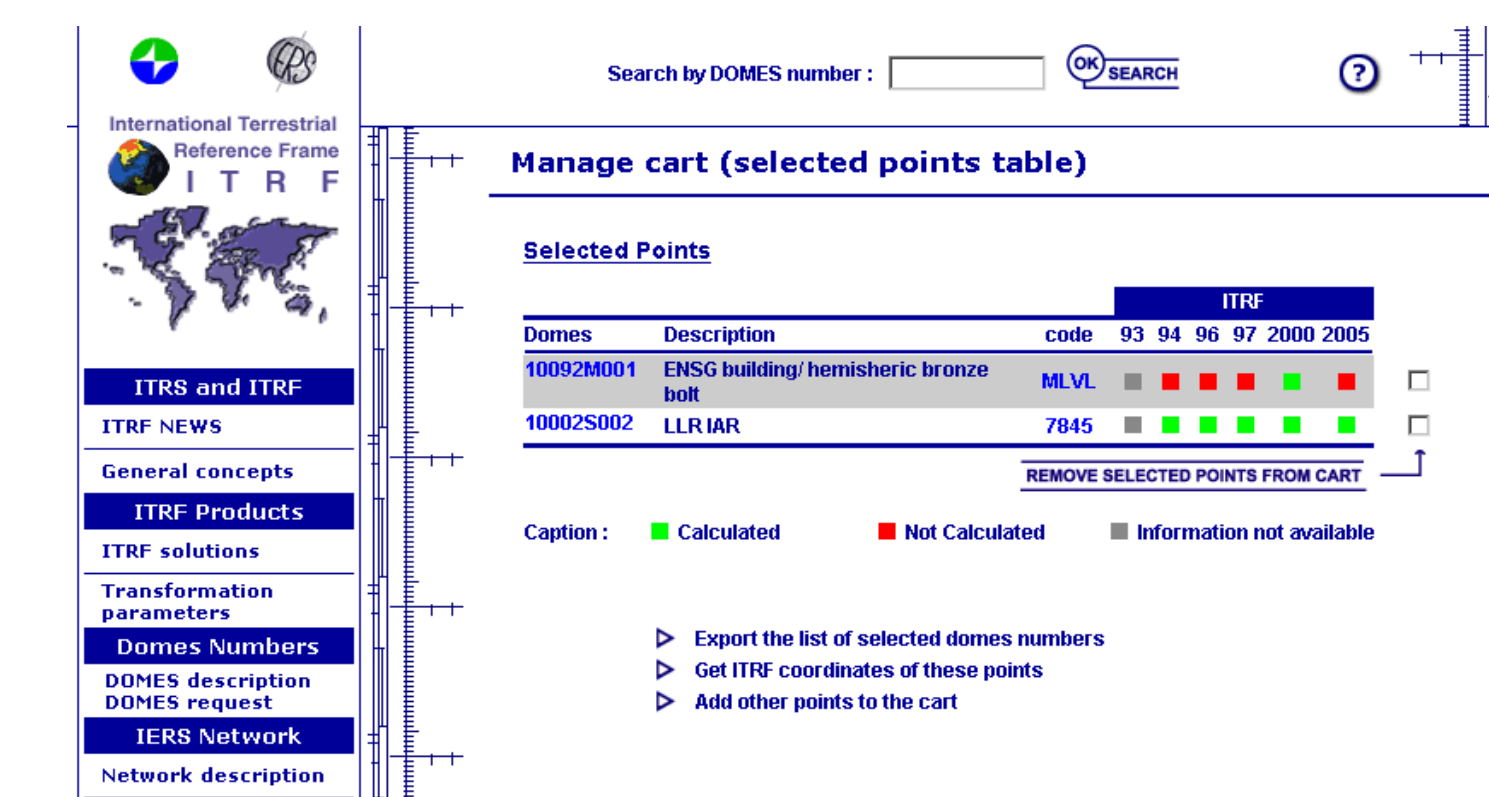
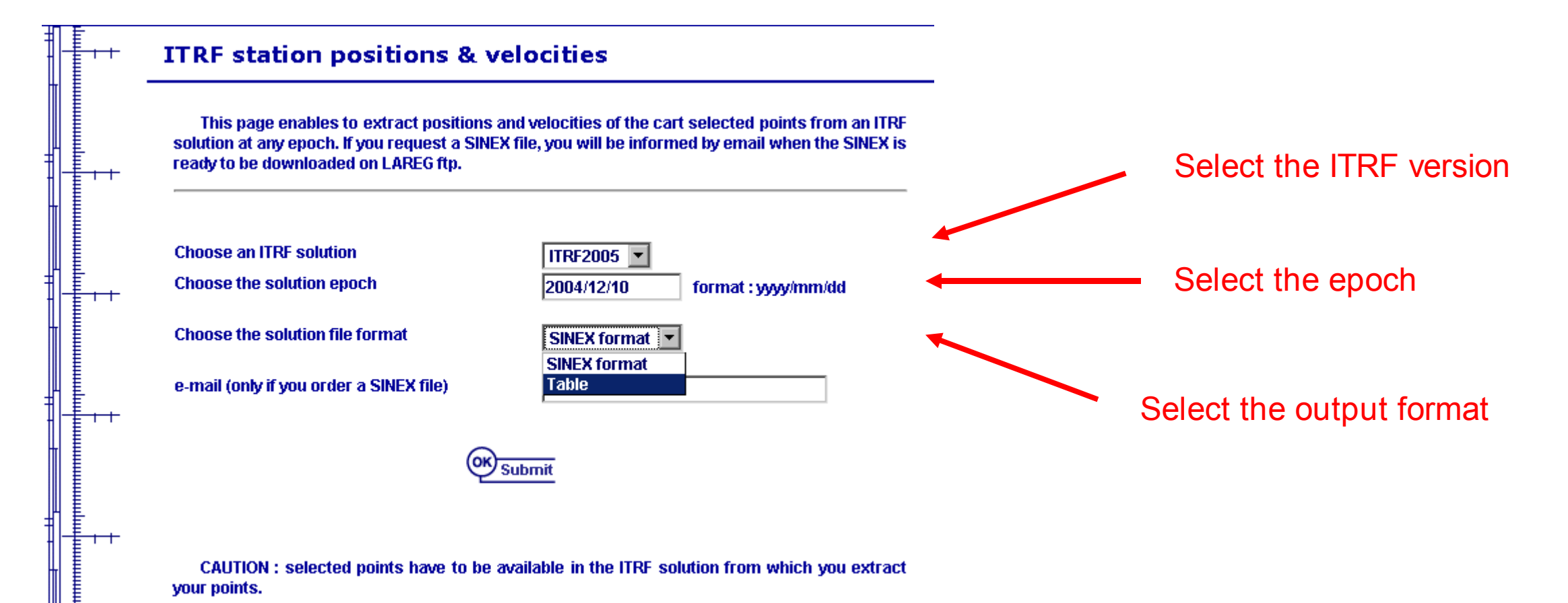


Figure 5: List of selected points.

Retrieve ITRF coordinates as table or SINEX file at any epoch



Select the ITRF version

Select the epoch

Select the output format

Figure 6: Use the ITRF web site tools to request ITRF coordinates of a specific network at any epoch

Software used :

- [A] Mapserver home page: <http://mapserver.gis.umn.edu/>
- [B] PostGIS home page : <http://postgis.refractive.net/>

Associated Web sites :

- [1] EOPs product center: <http://hpiers.obspm.fr/eop-pc/>
- [2] IDS : International DORIS Service, <http://ids.cls.fr/>
- [3] IERS : International Earth rotation and Reference systems Service, <http://www.iers.org>

- [4] IGS : International GNSS Service, <http://igs.cbl.nasa.gov/>
- [5] ILRS : International Laser Ranging Service, <http://ilrs.gsfc.nasa.gov/>
- [6] IVS : International VLBI Service, <http://ivsc.gsfc.nasa.gov/>