everything happens somewhere
“All human history takes place in space”

John Hessler, NPR, 12/14/2015
‘Map’ Is An Exquisite Record Of The Miles — And The Millennia
Spatial Thinking
Spatial Thinking

Walking: controlled falling
Spatial Thinking

Walking: controlled falling

We are geospatially oriented life forms
Spatial Thinking

geographic knowledge is pervasive
GIS Future

very promising rapid change and development
“When I think of all the major problems that we face throughout the world today - overpopulation, food shortages, reduced agricultural production, adverse climate change, poverty - these are all quintessentially geographic problems. These problems are all concerned with the human relationship to the land, and this is where GIS can make its biggest contribution. GIS is the technology of our times and is uniquely suited to assist in solving the problems that we face.” Roger Tomlinson, February 2009 GEOconnecton International Magazine

Dr. Roger F. Tomlinson, author of “Thinking About GIS: Geographic Information Systems Planning for Managers”, is the principal of Tomlinson Associates Ltd., a firm of consulting geographers he established in 1963 and incorporated in 1977. He has advised an impressive list of clients, from the World Bank to the U.S. and Canadian Forest Services. He holds two bachelor's degrees - a master's degree from McGill University in Montreal, Canada, and a Ph.D. from University College, London, England. He has also conducted successful GIS planning seminars worldwide.
Brief video clip:

Jack Dangermond Articulates the Future of GIS at Gov 2.0

http://www.vector1media.com/spatial sustain/jack-dangermond-articulates-the-future-of-gis-at-gov-2-0.html

Jack Dangermond
Founder and CEO of ERSI,
maker of ArcGIS
The Steinitz Model of Landscape Change

1. How should the landscape be described?
2. How does the landscape operate?
3. Is the landscape working well?
4. How might the landscape be altered?
5. What differences might the changes cause?
6. Should the landscape be changed?

Carl Steinitz ("A Framework for PLF," Landscape Future)
Link to Background paper from Jack Dangermond, ESRI


http://www.youtube.com/watch?v=eAFG6aQTwPk
1996 MapQuest
   (free road maps and directions on Internet)

1998 Google incorporated

1998 Microsoft TerraServer-USA
   (originally Microsoft Research Maps)

2004 Google Earth
   (originally Keyhole’s EarthViewer 3D)

Feb 2005 Google Maps
   (originally Google Local)

July 2005 Bing Maps
   (Live Local)
Thomas Friedman, NY TIMES, 3/2/2012;

"six years ago Facebook did exist, Tweet was a sound, the Cloud was still in the sky, 4G was a parking place, LinkedIn was a prison, applications were what you sent to college and Skype was a typo for most people."
WHAT3WORDS
Location Based Social Networks *(a few)*

- Facebook Places  Check-in
- FourSquare
- Google Latitude
- Trapster
- Waze
- Sweetr

VIBE & AskLocal
Location Based Photo Sharing (a few)

Wink (http://www.winktheapp.com)
Trover

General Photo Sharing (a few)
Facebook & Google Earth
Flickr
Instagram
Snapfish
Kodak Gallery
Panoramio
Picasa
Google+ Photos
Augmented Reality Apps

http://www.dialaphone.co.uk/blog/2012/10/13/top-five-augmented-reality-apps/

Google Goggles
Snapshop
Car finder
Augment
Layar
Location Based Photo Sharing *(a few)*

Wink  *(http://www.winktheapp.com)*
Trover
Directions Magazine
http://directionsmag.com

GIS Lounge
http://www.gislounge.com
GLONASS

“don’t buy a GPS without it”

Compass & Galileo (will come along in next few years to retail US GPS market)
New Developments in GIS

Date Entry, Delivery, and Visualization
Data Entry – GPS will shrink in size, expand in uses

Casio GPS Watch (PAT-2GP)

$499.99 $199.00

The newly upgraded Casio Global Positioning System (GPS) watch !! IN STOCK!! and at a real breakthrough price. Get yours at this price before it's too late. Retails at $499.99

Travel the Earth, Guided by Manmade Stars.

The world's first wristwatch with a built-in GPS capability is now better than ever. The new PATHFINDER SATELLITE NAVI features a more compact design, a rechargeable battery and greater water resistance. Multi-windowing provides enhanced data access, and PC linking enables you to manage landmark and check point data on your computer.

Rechargeable battery & compact design - the new PATHFINDER SATELLITE NAVI is equipped with a built-in battery you can recharge using the versatile recharger from an AC outlet at home or six AAA batteries when on the move. Installing this new battery has enabled us to create a design with increased compactness and sleeker lines, too--making it even easier to equip your wrist with an advanced GPS navigation capability.
GPS capabilities will improve

Higher real-time accuracies

Faster response

Better data display

Easier integration
GPS – extended technologies
e.g., laser rangefinding

**Laser Locator**

Laser Locator allows the determination of range, azimuth (bearing), vertical angle (inclination), height difference, and horizontal distance.

The Laser Locator is four instruments in one:

- Binoculars
- Laser Rangefinder
- Digital Compass
- Inclinometer
Improved Remote Sensing
New Sensors and Sensor Fusion
Altus II aircraft flying over southern California desert

NASA Dryden Flight Research Center Photo Collection
http://www.dfrc.nasa.gov/gallery/photo/index.html
NASA Photo: EC98-44684-2  Date: 29 Jun 1998  Photo by: General Atomics
Experimental Platforms
Miniaturization
UAV (drones)

Quadcopter
Fixed Wing

http://ardrone.parrot.com/parrot-ar-drone/usa/
UDI 818A HD Drone
Quadcopter with 720p HD...


http://ardrone.parrot.com/parrot-ar-drone/usa/

https://3drobotics.com/solo-drone/
ArcMap
Data Deliver – via the web

currently data are provided; in the future, updated, analyzed online

### Burglary

**Description & Legend**
The unlawful entry of a structure (both residential and non-residential) with intent to commit a theft.

**TOTAL BURGLARY GRID**
- Less than 1
- 1 - 5
- 5 - 10
- 10 - 20
- 20 - 30
- >= 30

### Larceny

**Description & Legend**
The unlawful taking of property from the possession of another; includes pickpocket, pursesnatch, shoplift, bike theft, and theft from motor vehicle (car prowl).

**TOTAL LARCENY GRID**
- Less than 1
- 1 - 10
- 10 - 25
- 25 - 50
- 50 - 100
- 100 - 250
- 250 - 500
- >= 500
Data Deliver – via the web
currently data are provided; in the future, updated, analyzed online
GPS Tracking – Integration with Wireless Services

Renting tracking equipment is ideal for expeditions, cross country travelers, long distance races, road rallies, extreme sports, school field trips, boating safety, monitoring inexperienced teen drivers, and in general, keeping up with the whereabouts of your family, friends and coworkers on an incidental basis.

Rent GPS Tracking Equipment

Depending on your equipment and service choices, you can:

- Display the location of your people via the web or directly to your internet enabled cell phone or PDA.
- Receive message alerts when your people travel outside a predetermined area or travel at excessive speed.
- Respond to distress call.

IMPORTANT – Read this article about "Using the GPS For People Tracking" before choosing equipment and services. Then, contact me about your specific needs.

Got Nextel?

Track your Nextel phone online. In a special arrangement with uLocate.com, Travel by GPS Patrons can track their Nextel phones* online.

Use Referral code: tbgu841 (case sensitive) when you open an account at www.ulocate.com

*Nextel phones that support GPS tracking applications include the Motorola i58, i88, i205, i305, i530, i730, i733.

Related Travel Services

Rent a GPS
Rent a Satellite Phone
Rent an Emergency Personal Locator Beacon
Visualization
It is now about:
“Open Source Software”

Open Source Geospatial Foundation
http://www.osgeo.org/

QGIS
http://www.qgis.org/

MapWindow
http://www.mapwindow.org/
“It’s crowd and cloud”

Mark Reichardt, president of Open Geospatial Consortium (OGC)
OPEN STREET MAP
http://www.openstreetmap.org/

Easy Downloads from Open Street Map
http://download.geofabrik.de/
Minnesota: http://download.geofabrik.de/north-america/us/minnesota.html

Apps on Using Open Street Map
http://www.scribblemaps.com/

http://www.google.com/mapmaker
Google Map Maker
MAP SERVER
http://mapserver.org/

Examples:
MNGEO & Minnesota Geospatial Data Commons
https://gisdata.mn.gov/
http://www.mngeo.state.mn.us/

DNR Recreational Compass
http://www.dnr.state.mn.us/maps/compass.html
Google Maps & Google Earth

Mashups - API
http://code.google.com/apis/maps/index.html

Examples:
http://www.programmableweb.com/api/google-maps/mashups
GeoPDF

Easy to make out of your ArcGIS (just check a box)

Easy to use with any modern Adobe Reader.

Example
http://nationalmap.gov/ustopo/

Colors on Maps

http://colorbrewer2.org/
Interesting geospatial movie clip (Bats)