

GRASS GIS, Star Trek and Old Video Tape

– a reference case on audiovisual preservation for the OSGeo communities



STAR TREK

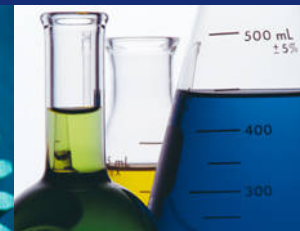


Peter Löwe¹, Janna Neumann¹, Margret Plank¹, Frauke Ziedorn¹,
Robert Lozar², James Westervelt², Roger Inman³

(1) Technische Informationsbibliothek TIB

(2) ERDC-RDE-CERL-IL

(3) Movingpictures TV



What to take home

- **Heritage** in geospatial FOSS projects
 - comprises software, data and all auxiliary documentation
 - is valuable
 - needs to be preserved in a sustainable way
- The heritage footprint is growing
- This growth accelerates as the projects grow and multiply
- Content needs to be queriable and citable
 - generating credit and recognition for its creators.

The Library Angle: Science + Open Source = Open Science



Science advances only if knowledge is shared.



***Accelerating the sharing of scientific knowledge
accelerates the advancement of science.***



German: Technische Informationsbibliothek (TIB)

- **largest science and technology library globally**
 - over 9 Mio. items,
 - 180 Mio. Documents (GetInfo Portal)
 - **125 km of shelving**
- **national library of Germany for**
 - **engineering, technology, and the physical sciences.**
- funded by the Federal Ministry of Education and Research and the 16 German states.
- **the world's first Digital Object Identifier (DOI) registration agency** for research data sets (since 2005).
- operates in conjunction with the **Leibniz University, Hannover.**

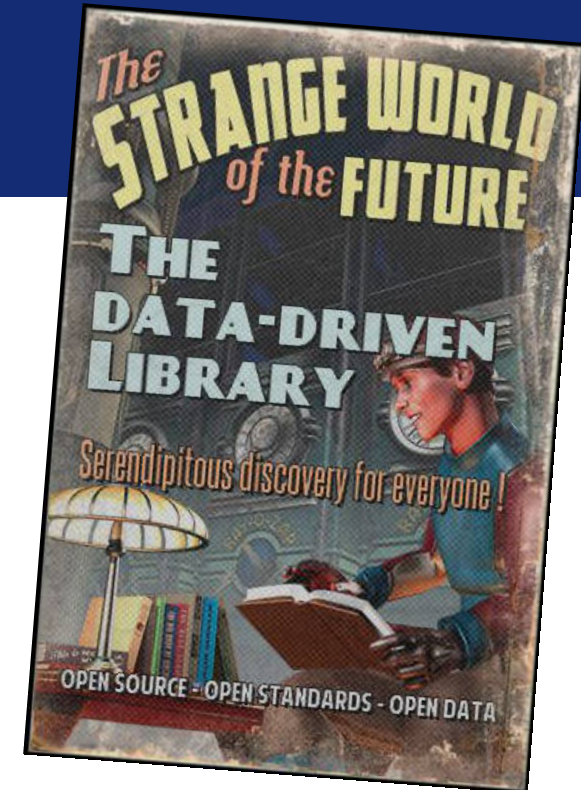


The future: Data-driven Libraries

„Libraries are changing from repositories for journals and books to engaged community centers offering new services, shaping innovative research.“

Libraries offer places and services for discovery.

The path to a relevant, 21st-century library: **“serendipitous discovery.”**

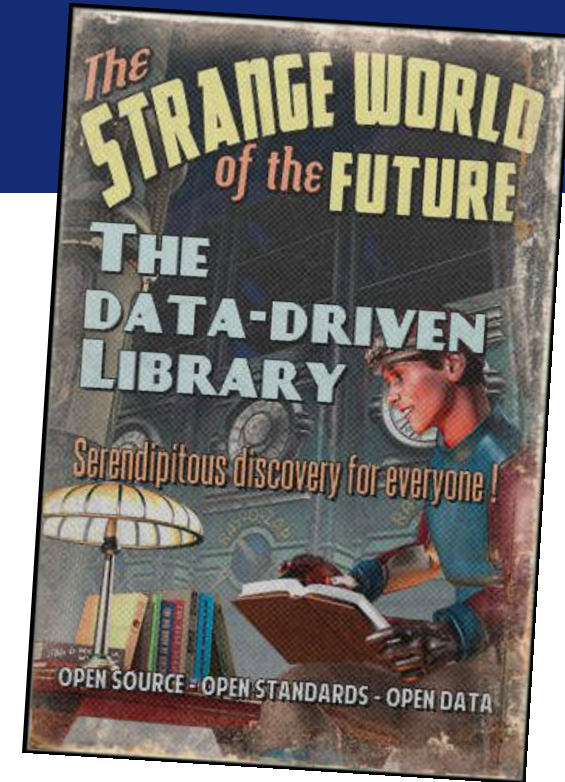


Christopher Erdmann, 2014

John G Wolbach Library at the Harvard-Smithsonian Center for Astrophysics

The future: Data-driven Libraries

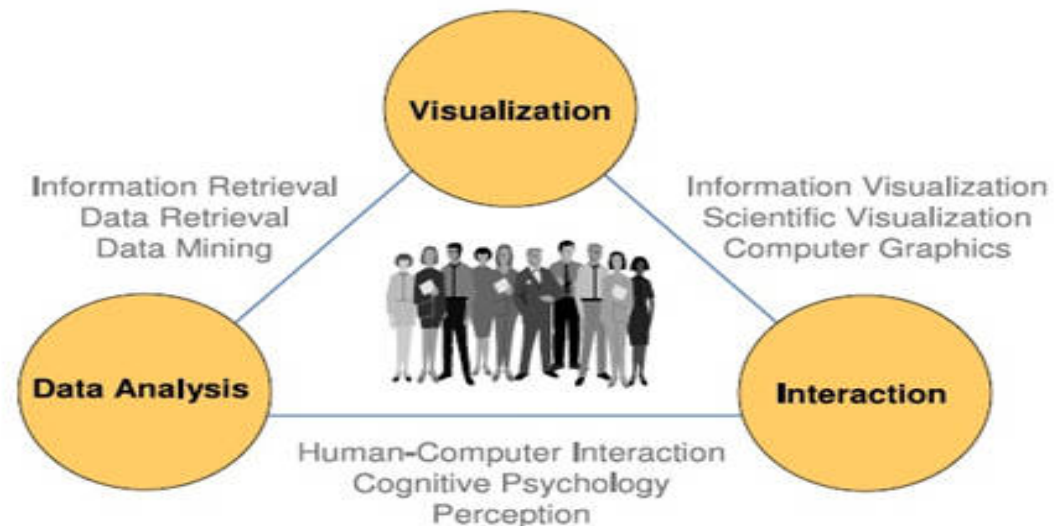
*„While scientists focus on the final frontier,
(data-driven libraries) will work on designing
a different kind of space
full of physical and virtual tools
that
capture imagination and
enable researchers to explore it.“*



<http://thrilling-tales.webomator.com>

Christopher Erdmann, 2014

John G Wolbach Library at the Harvard-Smithsonian Center for Astrophysics



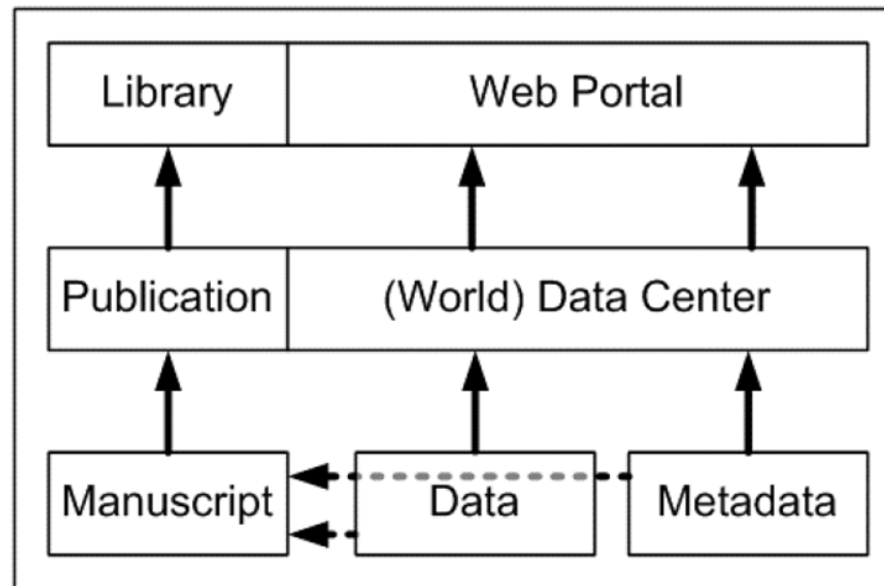
- Visual Analytics
- Ontologies

- Content based Retrieval
- Science 2.0 and Open Science

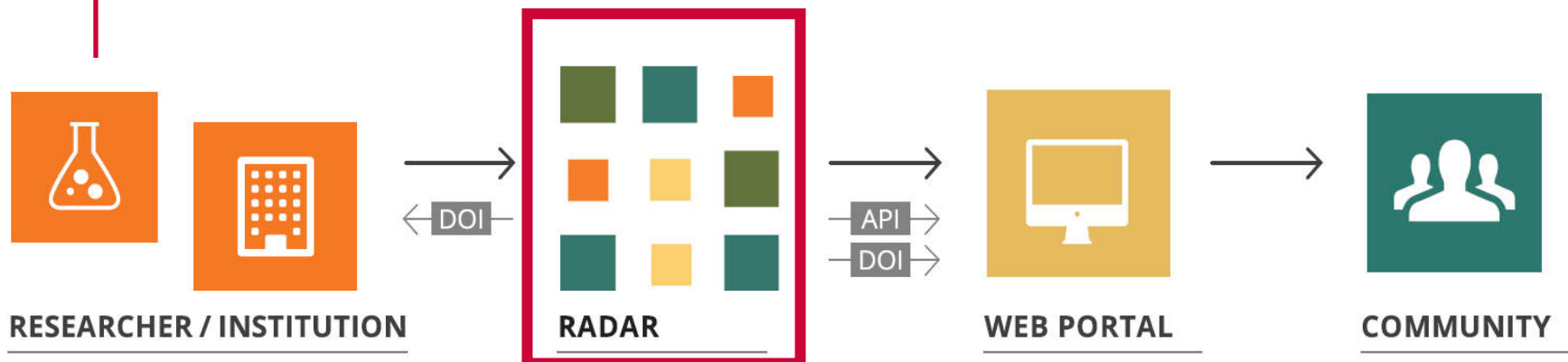
- Data need to be citeable to be “valuable”.
 - **“Reputation” is the currency of science.**
- Authors will only prepare data for publication if the effort is worthwhile.
 - **Data publication is labour intensive.**
- Data must be accessible to be re-used.
 - **Access through persistent identifiers and long-term archives.**
- Existence of data must be known.
 - **Dissemination of metadata to catalogues and portals.**
- Intellectual property rights need to be secured.
 - **Authors need full control of their publications.**

- Data Centers tie researchers and Digital Object Identifier-registration together.
- Data Centers provide long term archiving, proper meta data and quality control.
- **Challenges:**
 - Absence of policies.
 - Absence of infrastructure for data management.
 - Lack of financing.
- **A new hope:**
 - A growing number of funding agencies demand long term archiving and publication of research data.

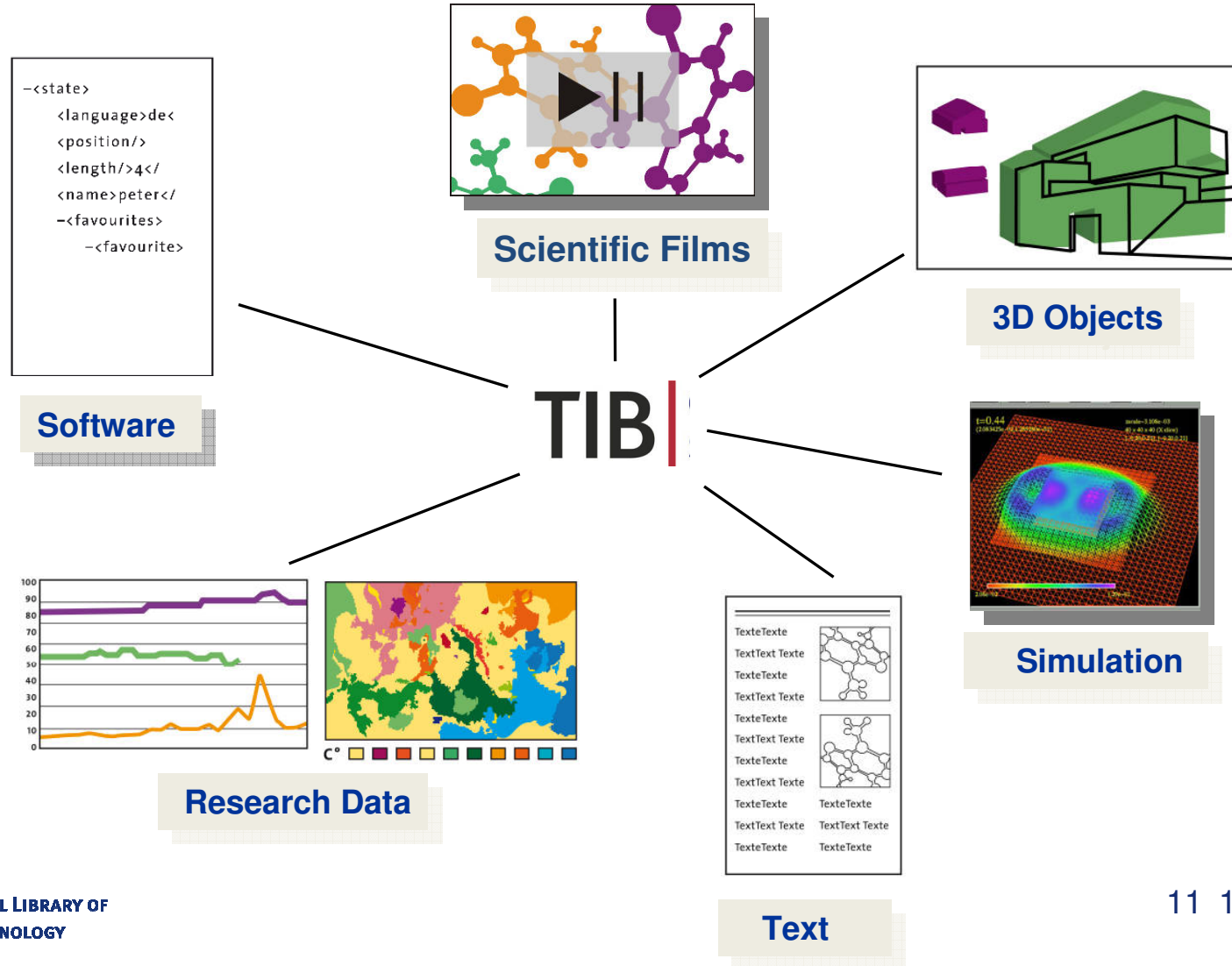
The RADAR Project: Research Data Repository



Klump, et. al, Data Publication in the Open Access Initiative, Data Science Journal, Vol. 5, 15 June 2006.



Strategy – Move beyond text



What about GRASS GIS ?



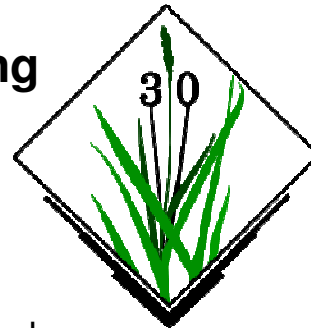
GRASS GIS: Geographic Resources Analysis Support System

- Development started in 1982
- One of the initial OSGeo projects
- <http://grass.osgeo.org>
- GPL-licenced
- Current versions:
 - GRASS 6.4.4**
 - GRASS 7.0 (beta)**
- Volumes, rasters, topological vectors**
- Temporal data**
- Cooperation with QGIS
- > 300 core modules, > 100 add-ons

The GRASS community

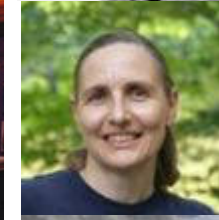
Alive, kicking – and growing

GRASS GIS is going strong
- for over 30 years



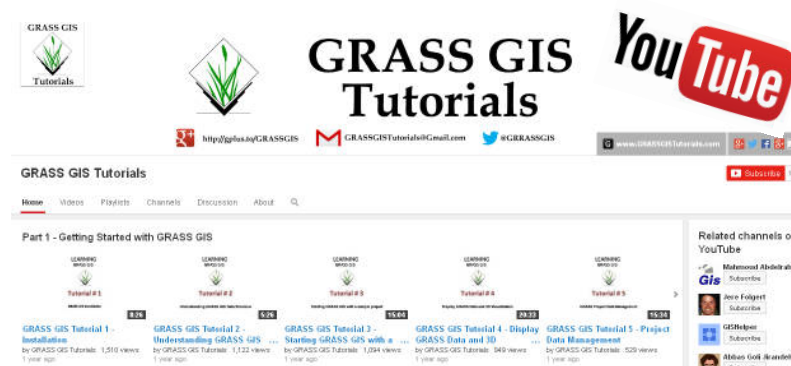
GRASS is people

- New generations of developers and users emerge
- People address new problems
- People retire from the project
- The GRASS history trail is growing
- **Knowledge + skill needs to be preserved**



Web 2.0: Video portals to share knowledge

- After 30 years: **Still nobody likes to write documentation**
- **YouTube and slideshare are heavily used**
to announce what we do and how we do it.
- **Web 2.0 audiovisual Webportals have become a large treasure trove of knowledge**



Today's perspective: Movie making is easy

<http://grasswiki.osgeo.org/wiki/Movies>



Page [Discussion](#)

Movies

[Contents](#) [hide]

- 1 Q: How to cons...
- 2 Q: How to cons...
- 3 Q: How to gene...
- 4 Q: How to creat...
- 5 Q: How to anim...
- 6 Q: How to anim...
- 7 Q: How to creat...
- 8 Examples
- 8.1 Animate d...
- 8.2 Animate to files

Q: How to create a screencast (for video tutorials etc)?

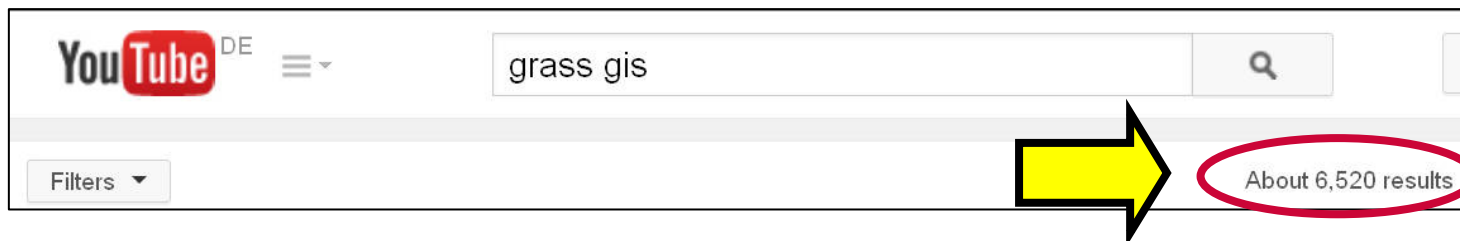
GNU/Linux

- Easiest way: [recordmydesktop](#) (user interfaces are 'qt-recordmydesktop' and 'gtk-recordmydesktop')
 - when uploading videos to Youtube created by recordmydesktop you need to encode the file eg. using `mencoder`
- No sound, just video screencast, as AVI file:

Publish your cool videos in this Wiki

We have installed a Mediawiki widget extension and created a special template for including Youtube videos ([Template:YouTube](#)). See also [wxGUI Modeler](#) page for the usage.

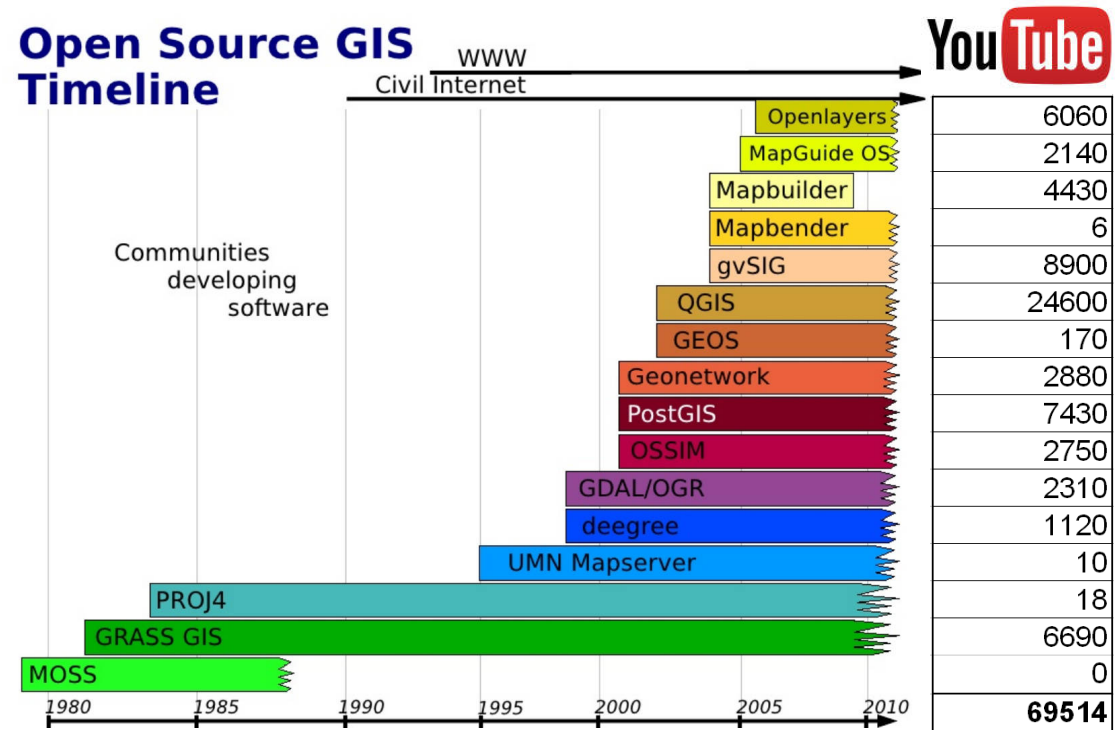
The overall goal is to have many as possible [GRASS GIS videos on YouTube](#)



Geospatial Open Source Projects: The rise of interconnected tools and mash-ups

Existing FOSS GIS communities continue to grow

- New communities emerge
- Mash-ups „interbreed“ existing functionalities



Source: Markus Neteler

<http://de.slideshare.net/markusN/from-a-niche-to-a-global-user-community-open-source-gis-and-osgeo>

YouTube What you get is ...
what you need ?

Search for „GRASS GIS“

Proper Metadata ?

Meaningful
search results ?

*How to quickly find that
certain video, blog entry,
etc. – without the URL ?*

*•How long will the content
actually be preserved ?*

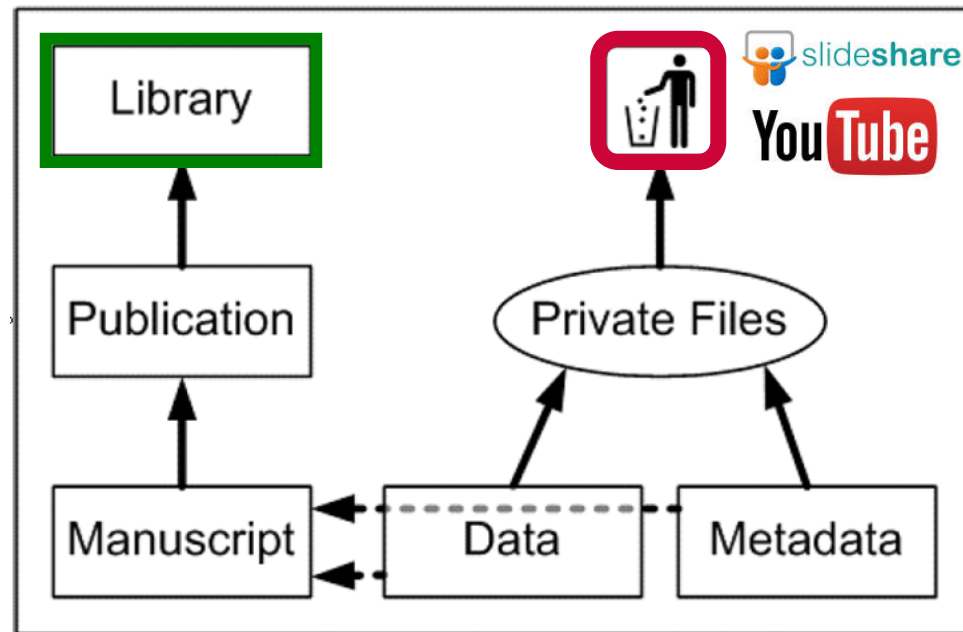
The screenshot shows a list of YouTube search results for 'GRASS GIS'. The results are as follows:

- Lecture : 1 | ArcGIS 10 : Introduction to ArcGIS 10**
by SabberFoundation
24,328 views
Duration: 20:45
- A Brief Introduction to GIS**
by UIELGIEN
6,292 views
Duration: 1:42:57
- 3D vizualization using GRASS GIS**
by karan choudhary
1,821 views
Duration: 14:35
- GRASS MOVIE CERL 1987**
by Miguel Sevilla-Callejo
8,560 views
Duration: 14:28
- Star Wars: Episode I - The Phantom Menace (1999) Bloopers Outtakes Gag**
by Bloopers & Making of by FilmsHow EXTRA
Recommended for you
Duration: 2:15
- GRASS GIS Tutorials - Tutorial 5 - Project Data Management**
by GRASS GIS
646 views
Duration: 15:34
- QGIS: Understanding and Using Attribute Data, Queries and Analysis**
by VTgeospatial
2,888 views
Duration: 1:02:18
- ArcMap Introduction Tutorial Part 1**
by Kenan BOLAT
3,076 views
Duration: 28:39

Reality Check 2014:

Our communication channels (Web 2.0) are

- **volatile,**
- **difficult to search and**
- **hard to cite.**



Klump, et. al, Data Publication in the Open Access Initiative, Data Science Journal, Vol. 5, 15 June 2006 nach Helly, Staudigel & Koppers, 2003

Ultimate Goal:

Interlinking and Search Across All Types of Digital Assets.

10.1594/PANGAEA.6075801

10.1594/PANGAEA.230525

MEHR ALS 135 MILLIONEN DATENSÄTZE IN GETINFO VERFÜGBAR

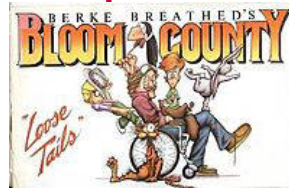
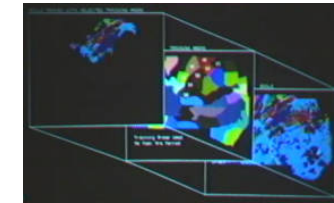
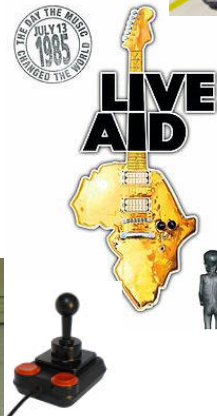
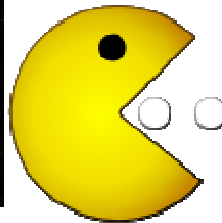
GetInfo
FACHINFORMATIONEN FÜR TECHNIK UND NATURWISSENSCHAFTEN

www.getinfo.de

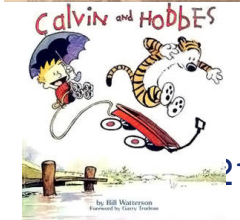
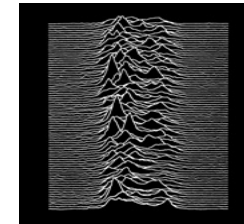
What about ...

STAR TREK

Let's go back to the 1980s

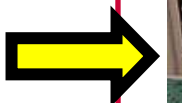


Sol Katz

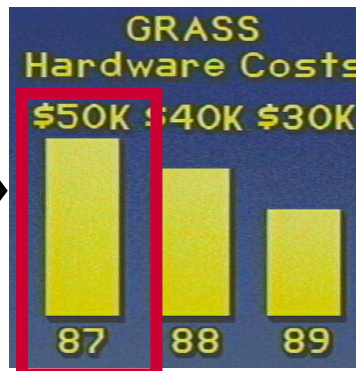


The early days of GRASS

Year	Installations	GRASS Version
1982	1	-
1983	3	-
1984	5	-
1985	20	GRASS 1.0
1987	100+	GRASS 2.0
1988	1000+	GRASS 3.0



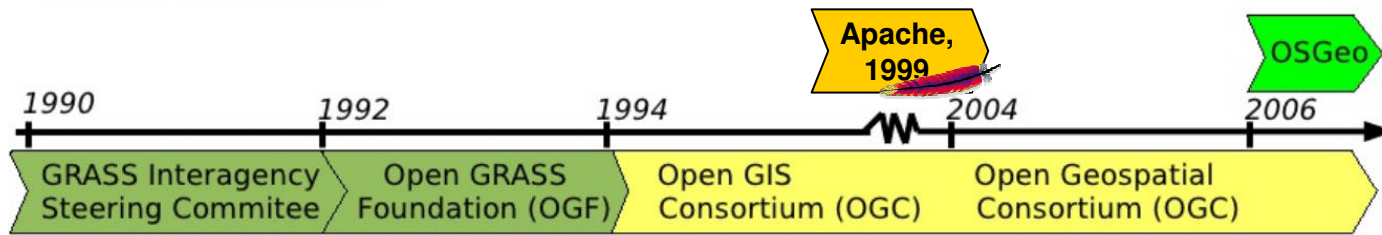
Sun 150U



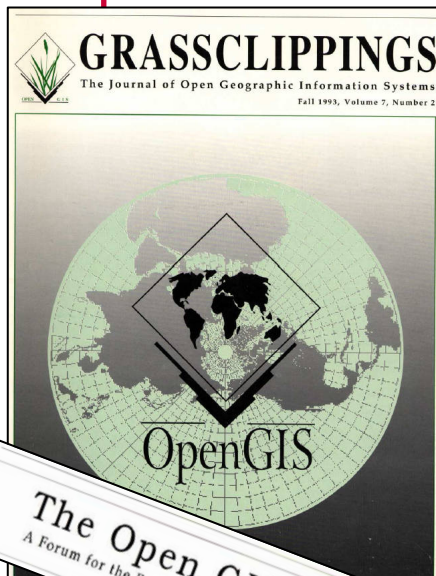
2014: \$90k



GRASS GIS: The starting point of OGC standards



Markus Neteler, 2013

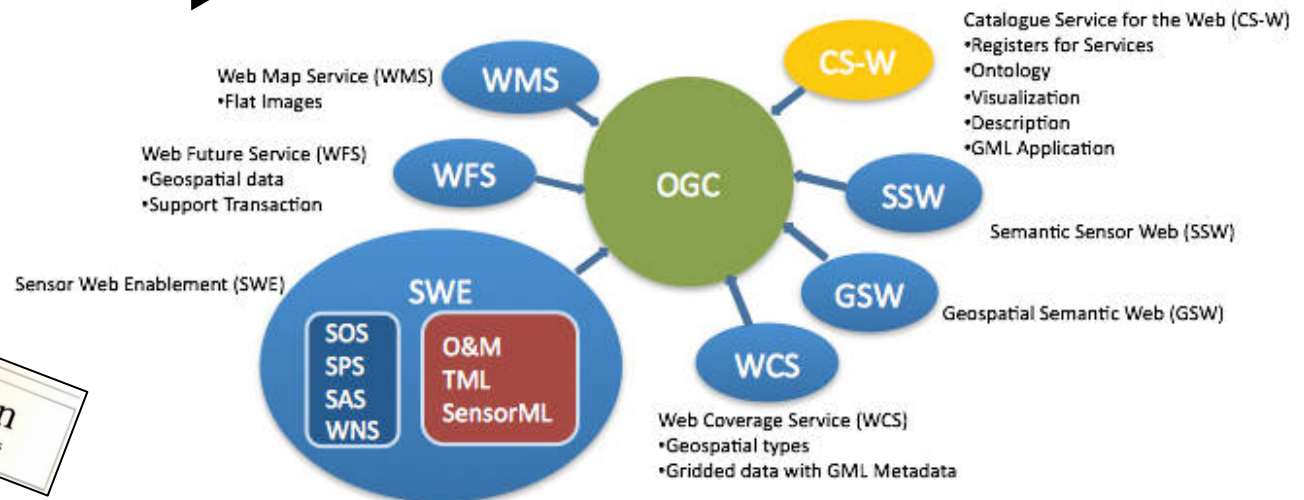


The Open GIS Foundation
A Forum for the Promotion of Open Geographic Information Systems

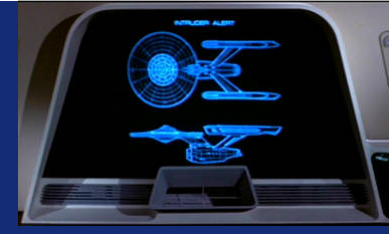
TIB GERMAN NATIONAL LIBRARY
SCIENCE AND TECHNOLOGY

OGC™

Open Geospatial Consortium, Inc.



GIS Customer demands were driven by Star Trek



1983

“Our For McClellan customer [...] was impressed with the new computer and software for his office and, upon seeing the first map image on the screen asked “Can you rotate it ?””

“We were amazed that he wasn’t aware of what was required to just get the image on the screen- and in color.”



1982: The Wrath of Khan

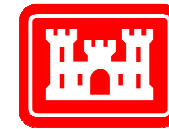
“The Star Trek television series had really raised expectations within our target user community.”

Jim Westervelt, 2004

http://grass.osgeo.org/uploads/grass/history_docs/westervelt2004_GRASS_roots.pdf

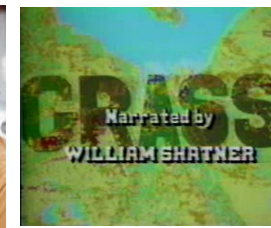
The 1987 promotional GRASS GIS video

- 1987: USA-CERL has a video for GRASS GIS produced.

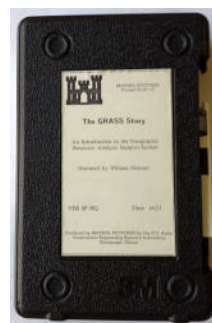


**US Army Corps
of Engineers®**

- Narrated by William Shatner (a.k.a. James Tiberius Kirk of Star Trek)



- Video was distributed on VHS tapes



Old Video Tape ?



<http://re-use-duce-cycle.blogspot.de/2012/09/old-video-tape.html>

Bridging the digital divide 2004



1990s

While the GRASS project evolved and addressed new kinds of geospatial challenges, **the GRASS video tape became legendary – and a preservation/access issue.**

2004

Jim Westervelt digitises a VHS copy.
First screening at the FOSS/GRASS
Users Conference in Bangkok 2004.

Jeff McKenna stores it on USB stick

.mov-file on the GRASS Webportal

2011

The video is uploaded to YouTube with
limited Metadata



The screenshot shows the GRASS GIS website. The header includes the logo and the text "The world's leading Free GIS software". The navigation menu contains links for Home, Downloads, Documentation, Gallery, Support, Constants, Development, and Get involved. A search bar is located below the navigation. The main content area is titled "Historical documents" and lists several text documents, including "GRASS GIS 1.0.0 beta1" and "The GRASS Story Video". The video entry is highlighted with a green background and includes a link to "Watch the video" (64 MB, 14 minutes, USA CERL, 1987).

The GRASS Story Video

[Watch the video](#) (64 MB, 14 minutes, USA CERL, 1987)

The U.S. Army Corps of Engineers Construction Engineering Research Laboratory produced this video to explain basic concepts and potential applications of geographic information systems to land managers at Army installations. Although the GRASS GIS is mentioned, the overall presentation of GIS topics is fairly generic. The video present a good, basic introduction to GIS that makes reference to GRASS (GRASS-GIS).



GRASS MOVIE CERL 1987

by Miguel Sevilla-Callejo • 3 years ago • 9,948 views

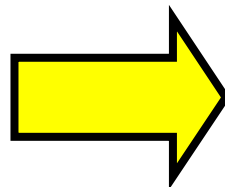
Downloaded from http://grass.osgeo.org/grass_movie_CERL_1987/ The basics of GIS are almost the same today I though ...

The challenge according to

WIRED

2013

- Wired magazine features the GRASS movie in an online article and describes both its **limbo status** and **significance**, being a **historic document**:
- **Absence of references/links to the movie:**
 - **not on the International Movie Database (IMDB)**
 - **not on Wikipedia**
 - **not on Mr. Shatners websi**



Video Flashback 1987: Shatner Tells You Where You Can Stick Your Maps

BY BETSY MASON | 08.07.13 | 6:30 AM | PERMALINK

Share 5 Tweet 1 +1 93 in Share Pin it

Source: <http://www.wired.com/2013/08/shatner-loves-digital-maps/>

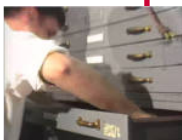
Praise by **WIRED**

- *„We’re pretty confident that if you really like Shatner, or you really like maps, you will really like this video. „*
- *„But we are absolutely certain that **if you are a professional geographer,***
 - ***you’ve probably already seen this video 100 times but***
 - ***still get super excited every time you watch it and***
 - ***can only barely contain yourself at timestamp 1:50***
 - ***when Captain Kirk’s voice tells you,***

Source: <http://www.wired.com/2013/08/shatner-loves-digital-maps/>

Praise by **WIRED**

- „We’re pretty confident that if you really like Shatner, or you really like maps, you will really like this video. „
- „But we are absolutely certain that **if you are a professional geographer,**



- *you’ve probably already seen this video 100 times but*
- *still get super excited every time you watch it and*
- *can only barely contain yourself at timestamp 1:50*
- *when Captain Kirk’s voice tells you,*

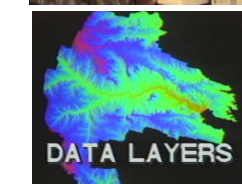
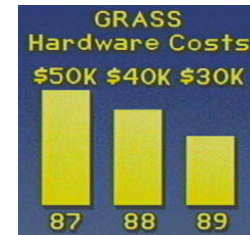
“Don’t keep your information about soils, vegetation, roads or archeological sites rolled up in map tubes or stuffed into drawers.”

Source: <http://www.wired.com/2013/08/shatner-loves-digital-maps/>

Praise by **WIRED**

- „We’re pretty confident that if you really like Shatner, or you really like maps, you will really like this video. „
- „But we are absolutely certain that *if you are a professional geographer,*
 - you’ve probably already seen this video 100 times but
 - still get super excited every time you watch it and
 - can only barely contain yourself at timestamp 1:50
 - when Captain Kirk’s voice tells you,

“Don’t keep your information about soils, vegetation, roads or archeological sites rolled up in map tubes or stuffed into drawers. Keep it in a computer.”

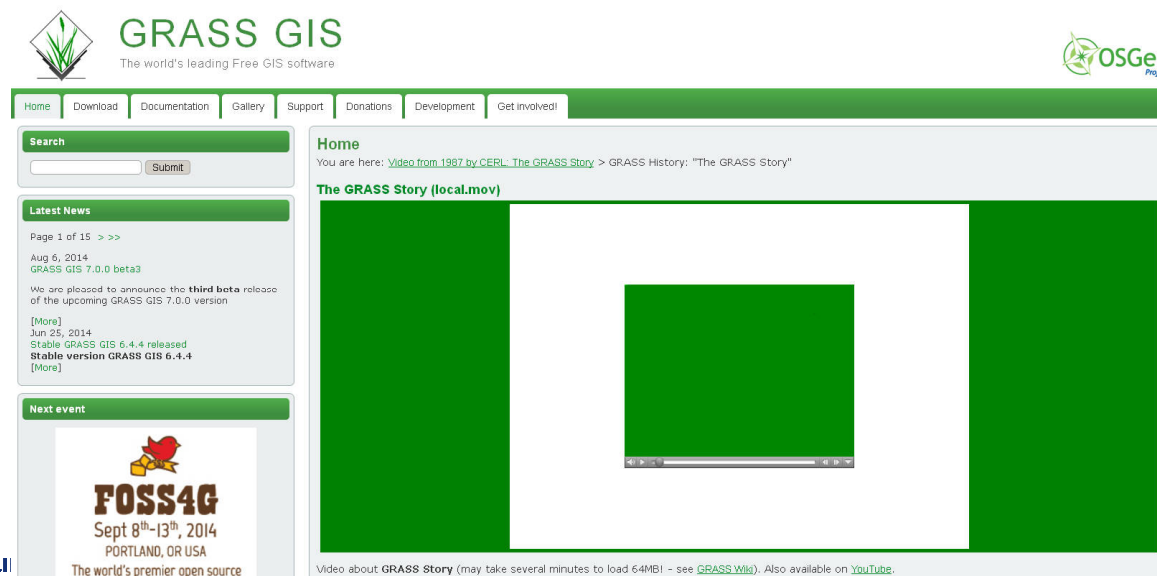


Source: <http://www.wired.com/2013/08/shatner-loves-digital-maps/>

2014: Ten years after its digitisation

The GRASS GIS movie remains hard to find ... and to use...

- The Youtube version is (still) not easily found
- Repeated discussions to store it on Youtube (again) in July 2014 on grass-dev mailing list
- Issue with the „aged“ MOV-format on the GRASS Portal.



The screenshot shows the GRASS GIS website interface. At the top, there is a navigation bar with links for Home, Download, Documentation, Gallery, Support, Donations, Development, and Get involved. The main content area is titled "Home" and displays the breadcrumb "You are here: Video from 1987 by CERL - The GRASS Story > GRASS History: 'The GRASS Story'". Below this, there is a section for "The GRASS Story (local.mov)" which contains a video player. The video player is currently showing a solid green screen, indicating a loading or playback issue. To the left of the main content, there is a sidebar with a search box, a "Latest News" section, and a "Next event" section. The "Latest News" section includes a link to "GRASS GIS 7.0.0 beta3" and "Stable version GRASS GIS 6.4.4". The "Next event" section features a logo for "FOSS4G" and the text "Sept 8th-13th, 2014 PORTLAND, OR USA". At the bottom of the video player, there is a caption: "Video about GRASS Story (may take several minutes to load 64MB! - see [GRASS Wiki](#)). Also available on [YouTube](#)."

The GRASS video is chosen as a potential test case for the new TIB portal for nontextual audio-video content.

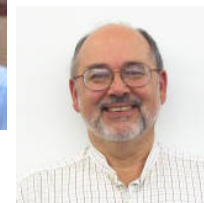
The project team from 1987 was contacted via Jim Westervelt:

Roger Inman (Movingpictures TV)



Roger

Robert „Bob“ Lozar (PI) (CERL)



Bob

Carla Peyton* (CERL)



Carla



Jim

- **„Roger [...] seemed interested in finding the original copy which would yield a much better digital version... „**
- **„If luck continues, Roger may be able to read that original with some old equipment to create something of archive quality.“**
- **Carla Peyton:** „She was intimately involved with the development of the video and did a lot of the post-editing; **a behind-the scenes creative genius**“ (passed away 2005)

Success: The GRASS 1987 video on the TIB AV-Portal

The screenshot shows the TIB AV-Portal search results page. The browser address bar displays 'https://av.getinfo.de/search?5'. The page header includes the TIB AV-Portal logo with 'BETA' in red, a language dropdown set to 'English', and the TIB logo with the text 'GERMAN NATIONAL LIBRARY OF SCIENCE AND TECHNOLOGY'. Below the header is a navigation bar with buttons for Home, Subjects, Publisher, About AV Portal, Watchlist, Upload, Login, and Register. A search bar contains the text 'GRASS' and a search icon. To the right of the search bar are social media icons for Facebook and Twitter. The main content area is divided into 'Search Results' and 'Filter' sections. The 'Search Results' section shows three video thumbnails: a person looking at a map, a slide titled '3.1 Texture Analysis', and a person in a lecture hall. The 'Filter' section has a dropdown menu for 'Subject' and three filter buttons: 'Physics (9)', 'Biology (5)', and 'Information technology (5)'. The text '30 Results' is displayed above the video thumbnails.

- A high resolution version of the GRASS 1987 video is available:
 - **Citable**
 - **Searchable**
 - **Long term preserved for the future.**

TIB AV-Portal: Close-Up View

1987 14:25



GRASS

Moving Pictures, US Army Construction Engineering Research

Found in:
Materials: 1
23
e-V



3.1 Texture Analysis

- Textures describe the nature of typical, recurrent patterns in pictures
- Important for the description of images
 - type of representation (natural images, etc.)
 - image algebra
 - Feature extraction
 - Analysis (e.g. scene analysis, object recognition, ...)

Texture Features, Low-Level Texture Features

Technische Universität Braunschweig, Institut für Informationssysteme

Found in:
Speech: 3

UCIRVINE
UNIVERSITY OF CALIFORNIA IRVINE

Example:

Basic Physics III Lecture 20

University of California Irvine (UCI)

Found in:
Speech: 1
Text in the Video: 2

Lecture 1

University of California Irvine (UCI)

Found in:
Speech: 2




GRASS

Published: 1987
Duration: 14:25
Publisher: Moving Pictures, US Army Construction Engineering Research

★ Ad
Wa
▶ Sh




1987 14:25




GRASS

Moving Pictures, US Army Construction Engineering Research

Found in:
Materials: 1
23
e-V



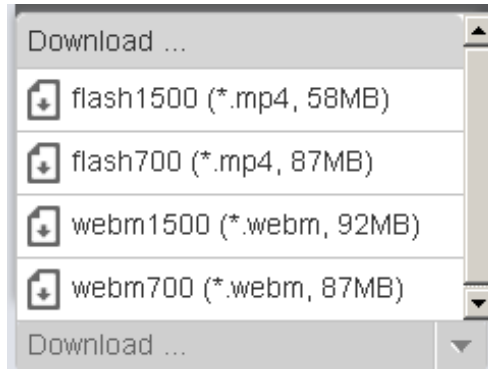
Click here for a preview! 

Enhanced search capabilities: Navigation by film segments and search strings

The screenshot displays a video player interface. The main video area shows a person reading a newspaper titled "RISS". Below the video is a timeline with a red bar indicating search results. A red callout box points to a specific segment on the timeline, stating "This segment contains your search result." A legend below the timeline indicates that red bars represent "Results found". The video player controls show a progress bar at 00:32 of 14:26, along with volume, play/pause, and full screen icons. A URL bar at the bottom contains the text: "Citation of Segment http://dx.doi.org/10.5446/12963#t=00:30-00:32".

Visual index

Download Options



- New (open) formats will be added in the future.

Citation of film content by Digital Object Identifiers (DOI)

Citation of Segment <http://dx.doi.org/10.5446/12963#t=00:26,00:32>

Citation of segments
DOI + Media Fragment Identifier (MFI)

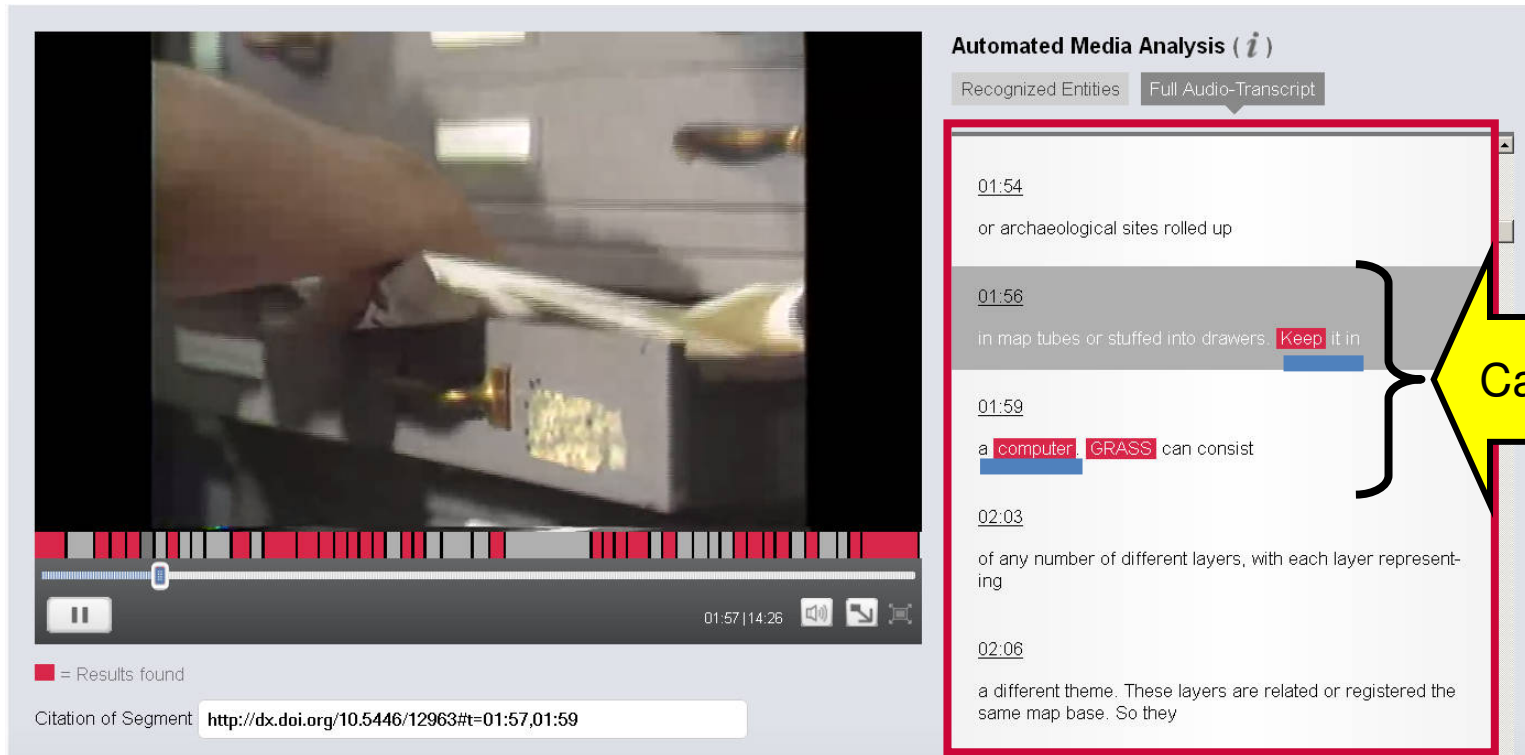
DOI

MFI
Timestamp

The screenshot displays the TIB AV-Portal BETA interface. At the top, a search bar contains the text 'GRASS'. Below the search bar, the page title is 'Video detail page' and the video title is 'GRASS'. A video player is visible with a play button and a progress bar. To the right of the video player is the 'Automated Media Analysis' sidebar, which includes a search bar and several checked options: 'Speech', 'Text in the video', and 'Image content'. Below these options are various categories like 'Complete program', 'Physical objects', 'Time series', and 'Emotions'. At the bottom of the page, the 'Citation of Segment' is shown as <http://dx.doi.org/10.5446/12963#t=00:31,01:00>. The TIB logo and 'GERMAN NATIONAL SCIENCE AND TECHNOLOGY' text are visible in the bottom left corner.

Navigation in metadata gained by automated video analysis from scene, speech, text and image recognition

Navigation by audio-transcript



The screenshot shows a video player interface. On the left is a video frame showing a hand interacting with a device. Below the video is a progress bar and a legend indicating that red bars represent 'Results found'. A citation of the segment is provided: <http://dx.doi.org/10.5446/12963#t=01:57,01:59>.

On the right, an 'Automated Media Analysis (i)' panel is open, showing a transcript. The transcript is divided into segments with timestamps and highlighted text. A yellow arrow labeled 'Caption' points to the transcript content.

Recognized Entities Full Audio-Transcript

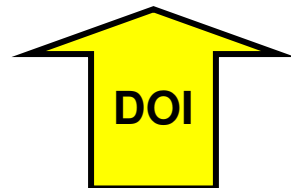
01:54
or archaeological sites rolled up

01:56
in map tubes or stuffed into drawers. Keep it in

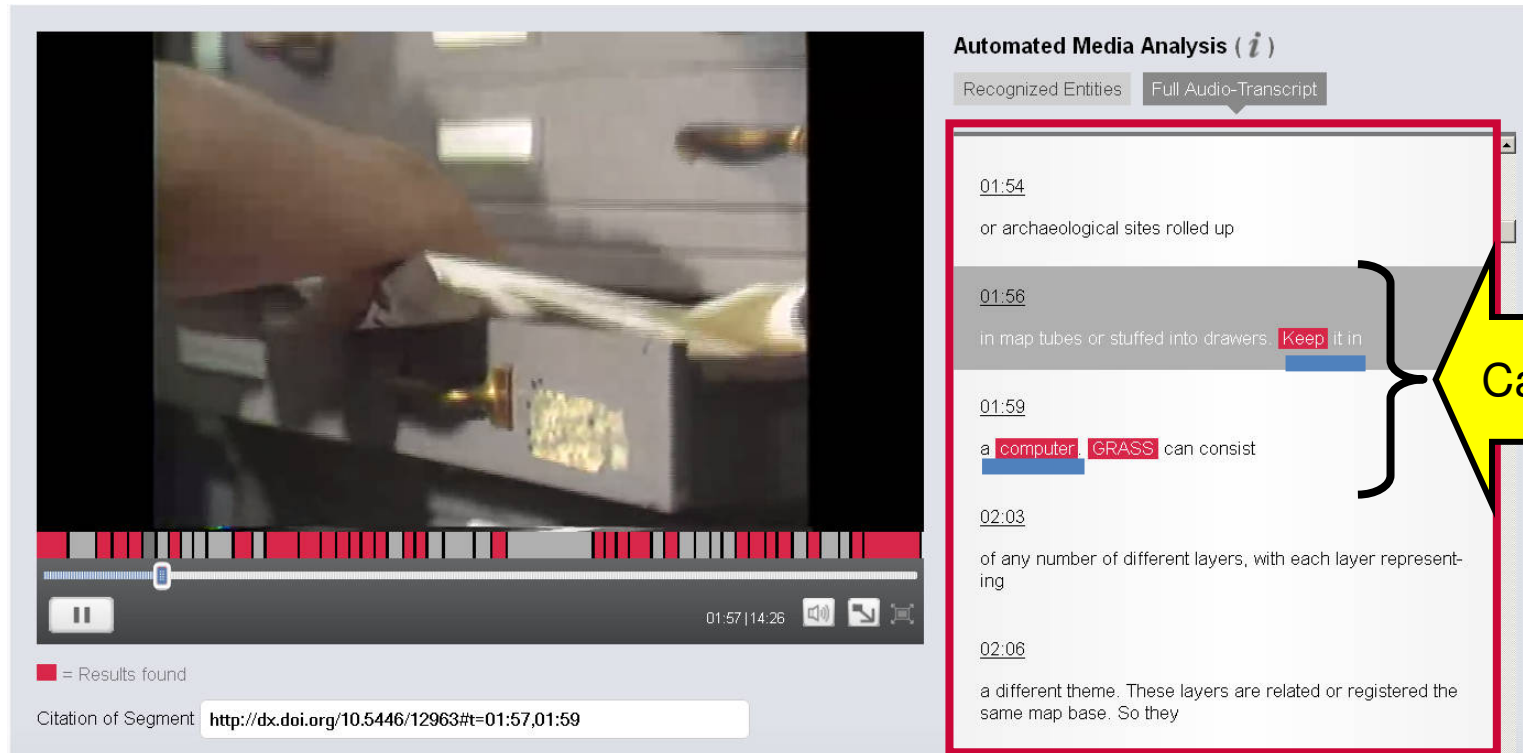
01:59
a computer, GRASS can consist

02:03
of any number of different layers, with each layer represent-
ing

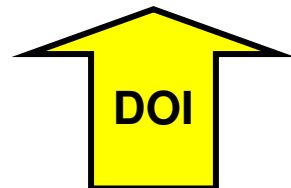
02:06
a different theme. These layers are related or registered the
same map base. So they



Navigation by audio-transcript



The screenshot shows a video player interface. On the left is a video frame showing a hand holding a tool. Below the video is a progress bar and a legend indicating that red bars represent 'Results found'. A citation of the segment is provided: <http://dx.doi.org/10.5446/12963#t=01:57,01:59>. On the right, an 'Automated Media Analysis (i)' panel is open, showing a 'Full Audio-Transcript' with several entries. A yellow arrow labeled 'Caption' points to the transcript entries for 01:56 and 01:59. The transcript text includes: '01:54 or archaeological sites rolled up', '01:56 in map tubes or stuffed into drawers. Keep it in', '01:59 a computer. GRASS can consist', '02:03 of any number of different layers, with each layer represent- ing', and '02:06 a different theme. These layers are related or registered the same map base. So they'.



„Keep it in a computer“

Content referencing by DOI

“Keep it in a computer.”

Citation of Segment

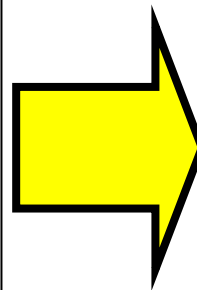
DOI resolver

Resolve a DOI string (e.g. 10.5284/1000164) by entering it below:



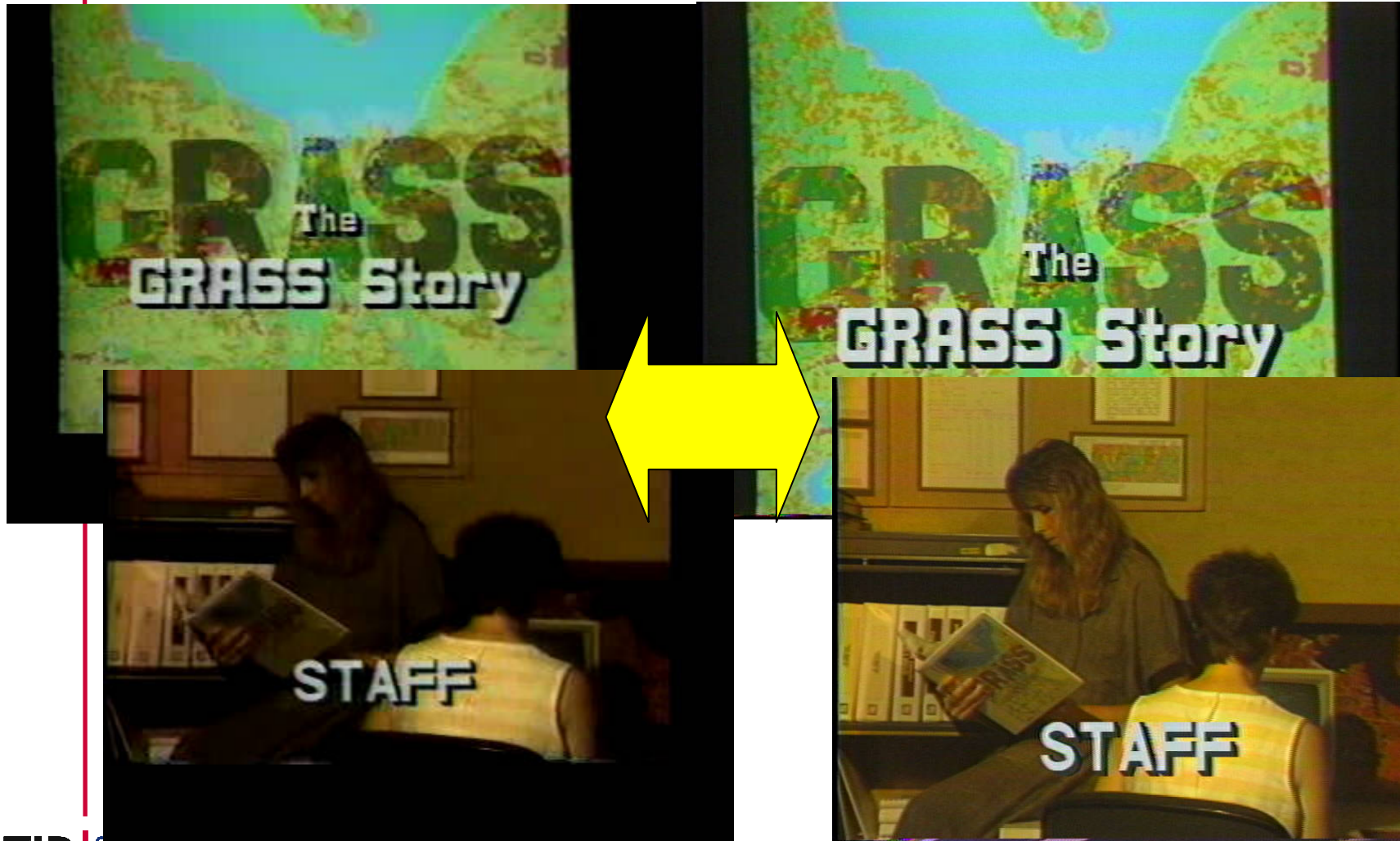
DataCite

Helping you to find, access, and reuse data



A screenshot of the TIB AV-Portal website. The browser address bar shows 'https://av.getinfo.de/media/12963?14'. The page header includes 'TIB | AV-PORTAL BETA' and navigation links for Home, Subjects, Publisher, and About AV Portal. A search bar contains the text 'GRASS'. Below the search bar, there are links for 'Back to shortlist' and 'Video detail page'. A red 'GRASS' tag is visible above a video player. The video player shows a black screen with the text 'Geographic Resource Analysis Support System' in green and yellow. A progress bar is visible at the bottom of the video player.

Video digitized from master tape:
Significantly improved quality



Improved quality: Readable screens

```
PLEASE SET GIS SESSION INFORMATION

LOCATION: This is the name of an available geographic location. -spearfish-
is the sample data base for which all tutorials are written.

MAPSET: Every GIS session runs under the name of a MAPSET. Associated
with each MAPSET is a rectangular COORDINATE WINDOW and a list
of any new maps created.

The WINDOW defaults to the entire area of the chosen LOCATION.
You may change it later with the command: window

-----
LOCATION:..... spearfish
MAPSET:..... johnson

AFTER COMPLETING ALL ANSWERS, HIT <ESC> TO CONTINUE
(OB INTERRUPT TO CANCEL)
```

Spearfish

```
GRASS GIS 6.4.3 Command Line
GRASS 6.4.3

DATABASE: A directory (folder) on disk to contain all GRASS maps and data.
LOCATION: This is the name of a geographic location. It is defined by a
co-ordinate system and a rectangular boundary.
MAPSET: Each GRASS session runs under a particular MAPSET. This consists of
a rectangular REGION and a set of maps. Every LOCATION contains at
least a MAPSET called PERMANENT, which is readable by all sessions.

The REGION defaults to the entire area of the chosen LOCATION.
You may change it later with the command: g.region
-----
LOCATION: utm10n_wgs84 (enter list for a list of locations)
MAPSET: PERMANENT (or mapsets within a location)
DATABASE: D:\geodata\locations

AFTER COMPLETING ALL ANSWERS, HIT <ESC><ENTER> TO CONTINUE
(OB <Ctrl-C> TO CANCEL)
```

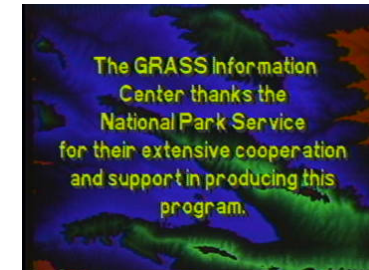
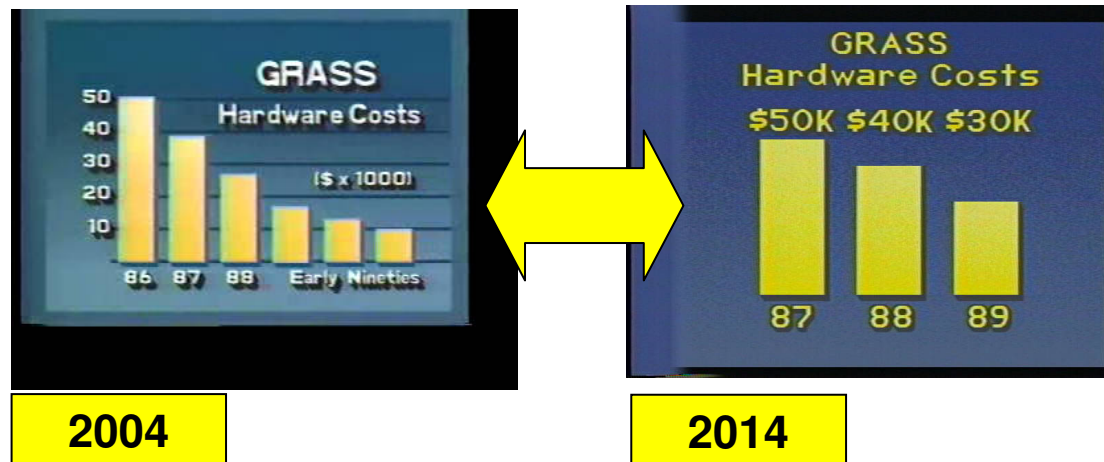
GRASS 2.0

30 years later

GRASS 6.4

Surprise: A director's cut ?

- Multiple small but notable differences in the versions digitized in 2004 and 2014 !



The road ahead (short term)

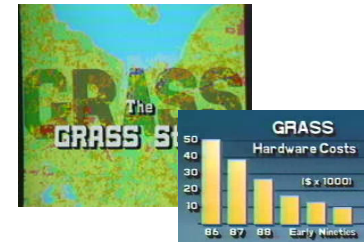
TIB

- Long Term Archiving
- AV-Portal
 - The TIB AV Portal is still beta.
 - Overall goal: Continuous service improvement

TIB | AV-PORTAL **BETA**

GRASS 1987 Video

- The low-res alternative version will also be archived for reference



OSGeo-related content

- The search for historic FOSS GIS videos continues.
- Heritage preservation is recognized by OSGeo.



Challenges ahead (long term)

**KEEP
CALM
AND
BOLDLY
GO**

Visual analytics for the geospatial FOSS communities „Dwarfs standing on the shoulders of giants“

External View:
GIS is a **gigantic exoskeleton** for data handling



http://img3.wikia.nocookie.net/_cb20140207013732/pacificrim/images/f/16/Pacific_rim_poster.jpg

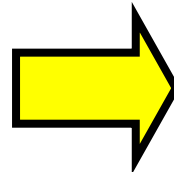


<http://beyondthebunker.files.wordpress.com/2011/02/the-hobbit.jpg>

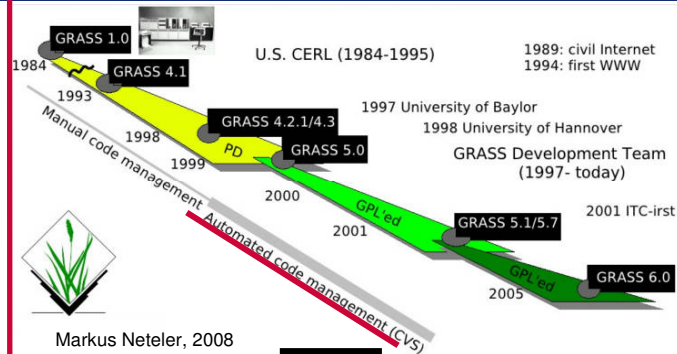
Internal FOSS View:
GIS is an ongoing process of continuously improvement of workflows

„Current code is based on previous work“ :

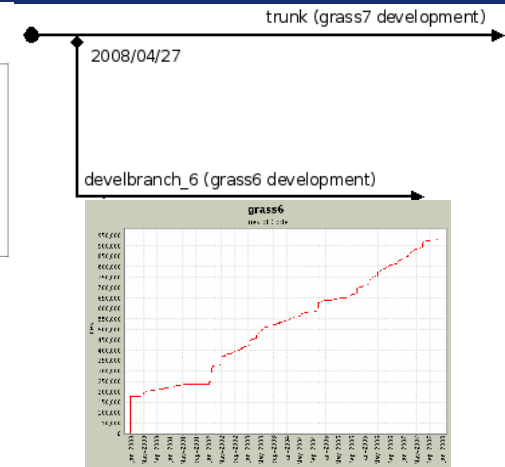
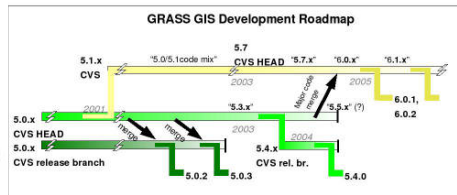
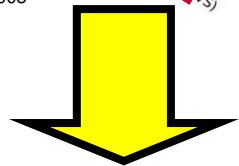
„dwarfs building on previous work by many others“



New ways to visualize software evolution



Markus Neteler, 2008



Gource Software Version-Control Visualization (C) 2009 Andrew Caudwell

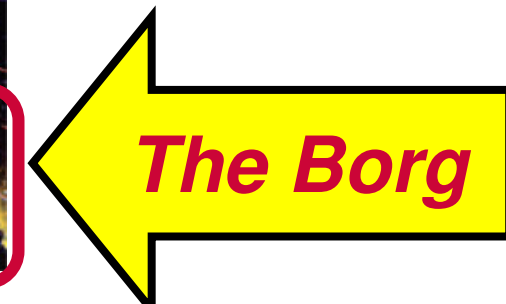
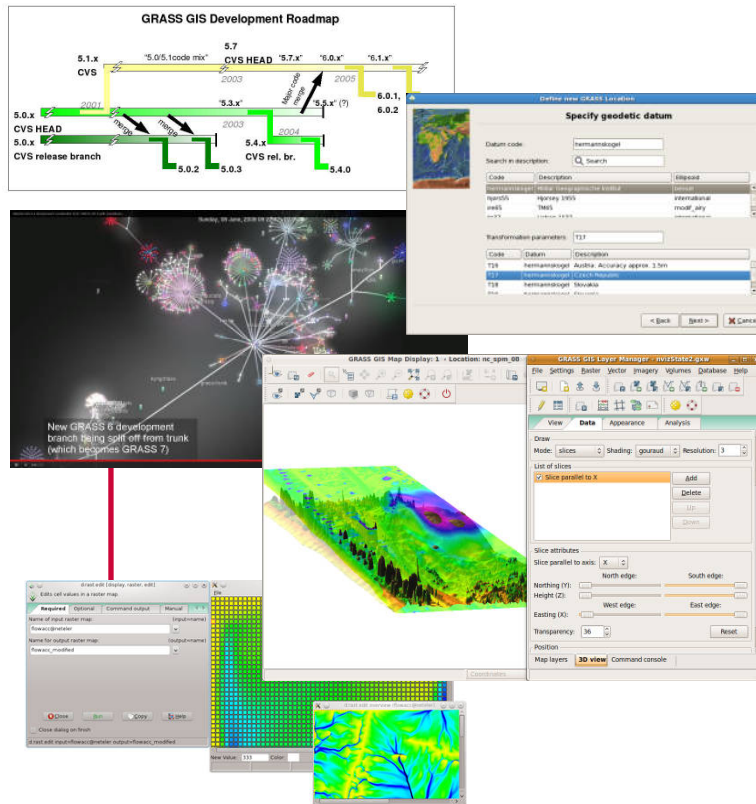
GRASS GIS 6.4 development visualization from 1999 to 2013

GRASS GIS 5.0 is being stored in an online source code repository in December 1999...

TIB | AV-PORTAL BETA

YouTube

1982 – 2014: GRASS has evolved, so has Star Trek, and we have, too



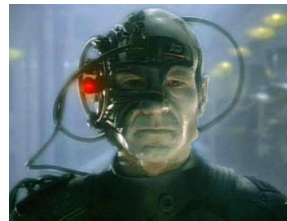
Borg – sounds swedish ?

Borg (*Star Trek*)

From Wikipedia, the free encyclopedia

„The Borg are a **collection of species** that have been turned into cybernetic organisms **functioning as drones** of the **Collective**, or the **hive**.“

[http://en.wikipedia.org/wiki/Borg\(Star_Trek\)](http://en.wikipedia.org/wiki/Borg(Star_Trek))



Borg ? Why bother ?

– The curious case of ISEE-3



http://38.media.tumblr.com/e140f612da53b039ef42cc7e15e13cb9/tumblr_n6ct9pjDUJ1rxiqe4o1_1280.jpg

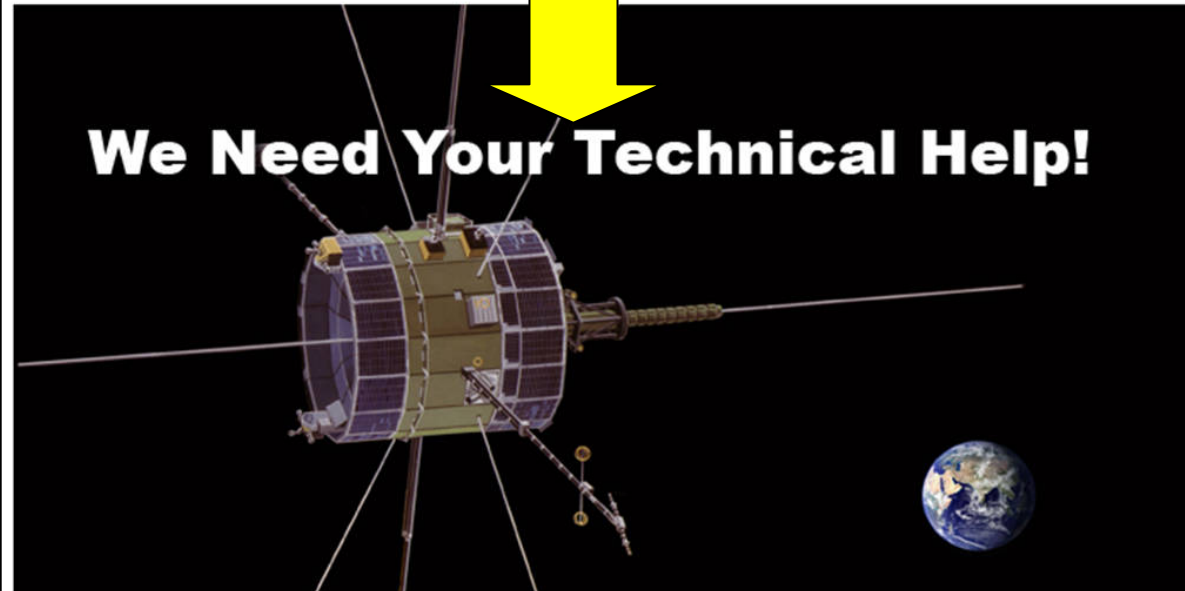
- NASA Probe in solar orbit: **Active 1978 - 1997**
- Expertise on how to operate was not preserved
- **Crowdsourcing project** took control in 2014 and
- asks „internet hive mind“ for help:

We Are Borg: Crowdsourced ISEE-3 Engineering and the Collective Mind of the Internet

<http://spacecollege.org/isee3/we-are-borg-crowdsourced-isee-3-engineering-and-the-collective-mind-of-the-internet.html>

By Keith Cowing on July 15, 2014 2:12 PM

We Need Your Technical Help!



We Are Borg: Crowdsourced ISEE-3 Engineering and the Collective Mind of the Internet



„[...] with the call that our ISEE-3 reboot team put out to the internet for help in debugging our propulsion system problem, I have come to realize that

a significant portion of humanity has reached a Borg like state, one where the internet has become a collective mind for communications and knowledge sharing.

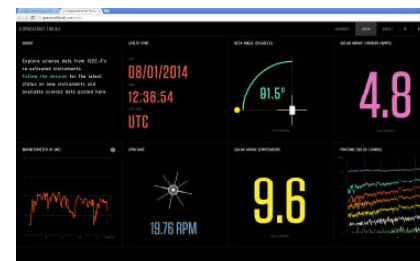
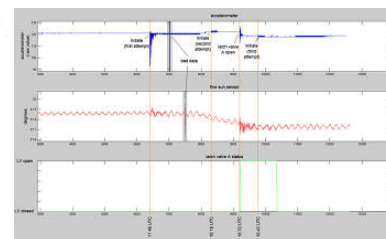
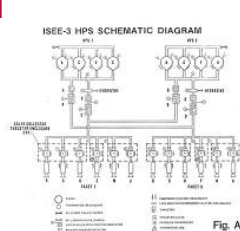
*We still have our individuality, we can still decouple at will from the collective mind, but in a way that few philosophers or technologists have envisioned, **we are connected in a way never before thought possible.***

[...]

*However, and this is what I leave the reader to ponder, **we have reached a threshold where vast numbers of people can work together in a near real time manner to solve problems and do good and interesting (or evil) things. One wonders where this will go....“***

Dennis Wingo, July 15 2014

<http://spacecollege.org/isee3/we-are-borg-crowdsourced-isee-3-engineering-and-the-collective-mind-of-the-internet.html>



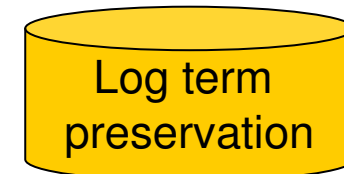
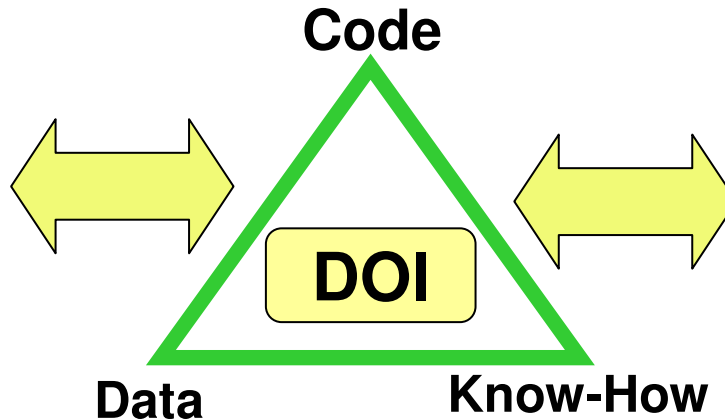
So we are the OSGeo Borg ...
 where will this will go ?



Past:

„Keep it in a computer.“

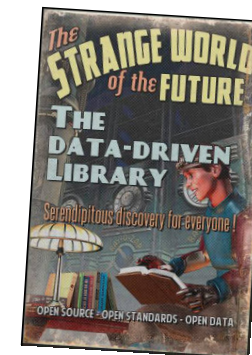
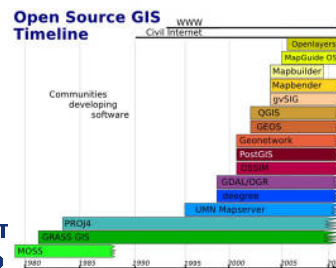
Present:



TIB | AV-PORTAL ^{BETA}

The Future:

Holistic knowledge space for geospatial open source !



Conclusion

KEEP
CALM
AND
BOLDLY
GO



Thanks for listening !

- Visit the TIB AV-Portal: <http://av.getinfo.de>
and enjoy the GRASS 1987 promotional video
- GRASS promotional video: <http://dx.doi.org/10.5446/12963>
- GRASS Code evolution video: <http://dx.doi.org/10.5446/14652>

Contact:

Peter "resistance is futile" Löwe
peter.loewe@tib.uni-hannover.de

