GNU Free Call

- eHealth through a Healthnet of cars and cell phones

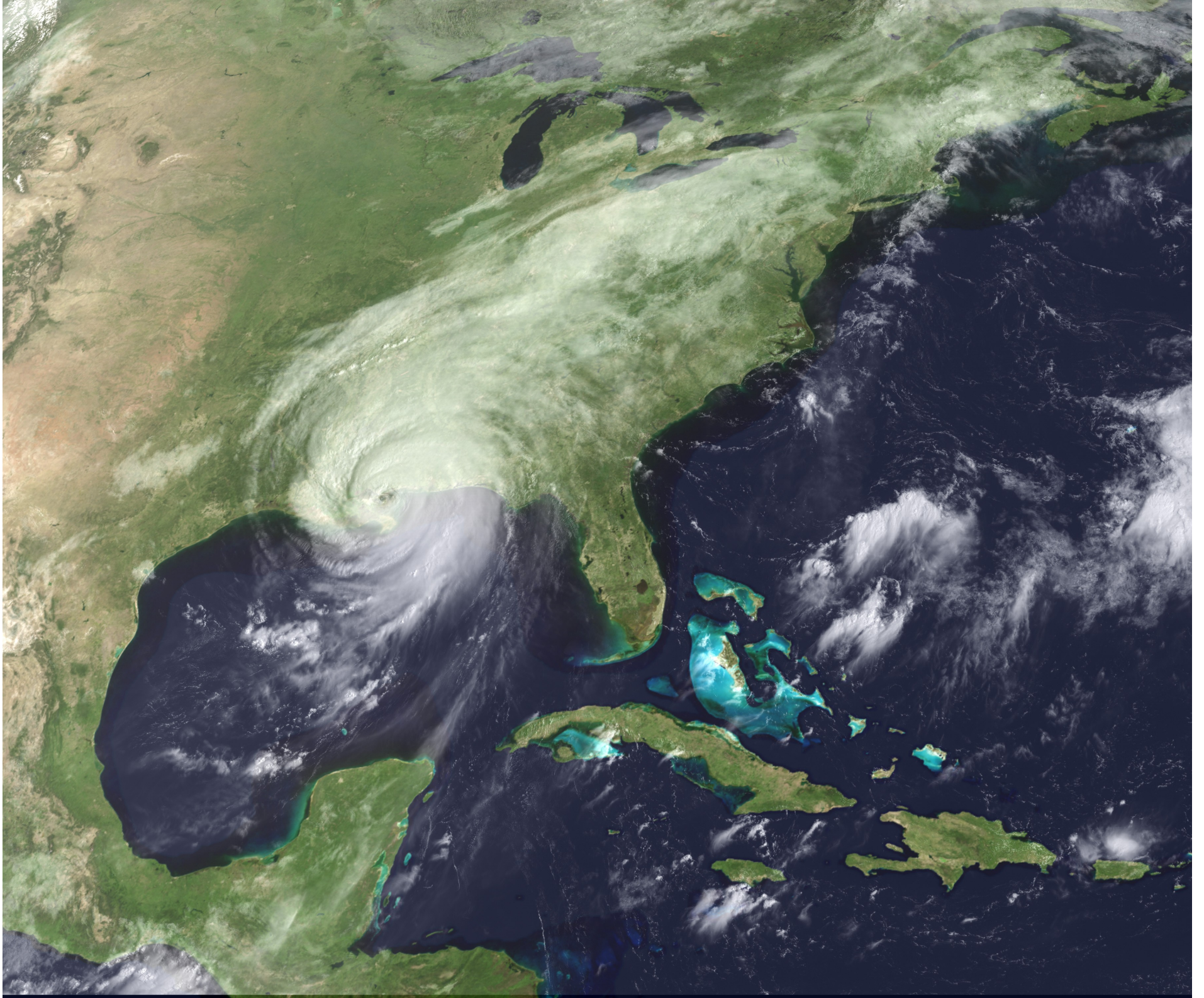Haakon Meland Eriksen, project coordinator

Overview

- About us

- Consequences of natural disasters on telecommunication

- How GNU Free Call can help

- Collaborating partners

- A healthnet of cars and cell phones

- Time for questions

Who we are

- Free Software Foundation has the GNU Telephony project,
  GNU Telephony has GNU Free Call.

- David Sugar, principal architect, USA

- Haakon Meland Eriksen, project coordiantor, Norway

- Contributors have come forward from Australia, Ukraine, Brazil, Norway and more.

Last Irene - 1999

Irene yesterday

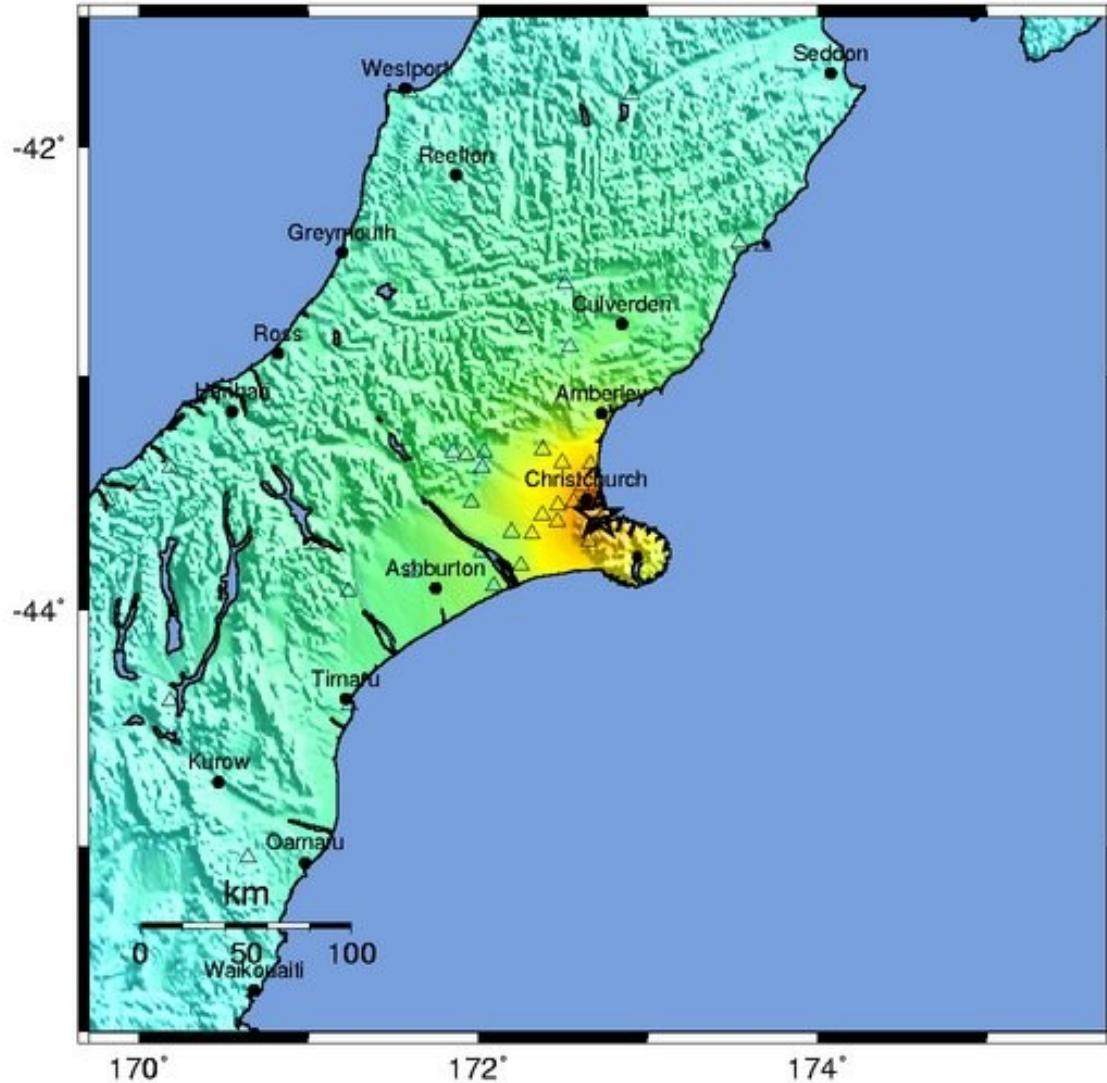# USGS ShakeMap : SOUTH ISLAND OF NEW ZEALAND

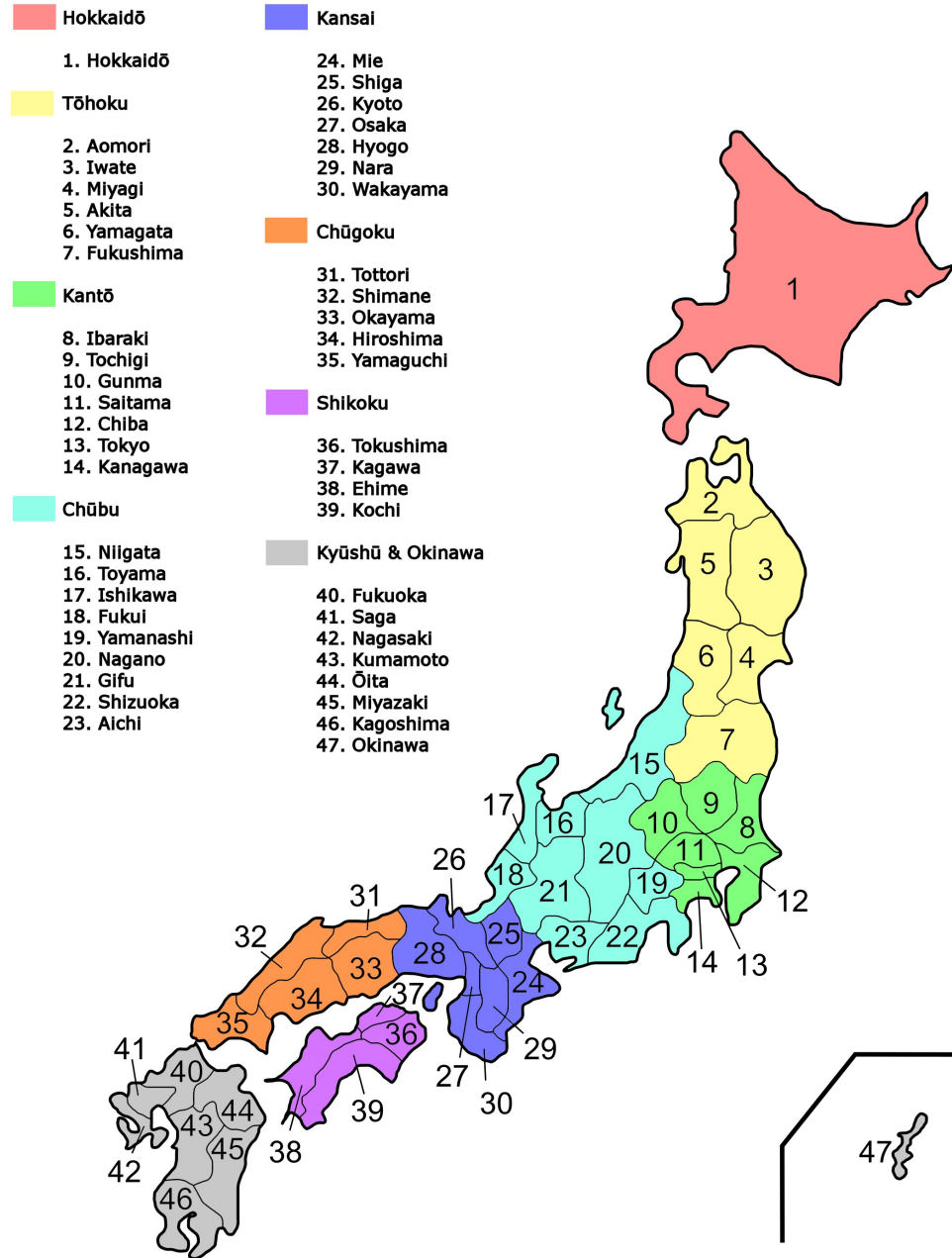Mon Feb 21, 2011 23:51:43 GMT   M 6.3   S43.60 E172.71   Depth: 5.0km   ID:b0001igm

Map Version 4 Processed Mon Feb 21, 2011 09:58:21 PM MST – NOT REVIEWED BY HUMAN

PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	Very Heavy
PEAK ACC.(%g)	<.17	.17-1.4	1.4-3.9	3.9-9.2	9.2-18	18-34	34-65	65-124	>124
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INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+

Regions and Prefectures of Japan

Hokkaidō

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2. Aomori
3. Iwate
4. Miyagi
5. Akita
6. Yamagata
7. Fukushima

Kantō

8. Ibaraki
9. Tochigi
10. Gunma
11. Saitama
12. Chiba
13. Tokyo
14. Kanagawa

Chūbu

15. Niigata
16. Toyama
17. Ishikawa
18. Fukui
19. Yamanashi
20. Nagano
21. Gifu
22. Shizuoka
23. Aichi

Kansai

24. Mie
25. Shiga
26. Kyoto
27. Osaka
28. Hyogo
29. Nara
30. Wakayama

Chūgoku

31. Tottori
32. Shimane
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38. Ehime
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How telecommunications break down

- Physical destruction of network parts
- Interruption of supporting functions
- Traffic jams or network overload

Collaborative partners in Free Software

- Individual contributors

- Village Telco – offers telephony solutions in developing countries in unlicensed spectrum where GSM is hard to come by and expensive. www.villagetelco.org.

- Ahumanright – connect everyone, ahumanright.org/blog/about.

- Serval-project – decentralized telephony, one of the projects that resembles GNU Free Call the most. www.servalproject.org.

- FreedomBox – Free Software, plug-and-forget-boxes, which enables you to enjoy both social media and privacy.

- Sahana? Haakon made a Norwegian translation of an older version. We will contact them. www.sahana.lk.

- OpenStreetMap? www.openstreetmap.org.

eHealth through a healtnet
of cars and cell phones
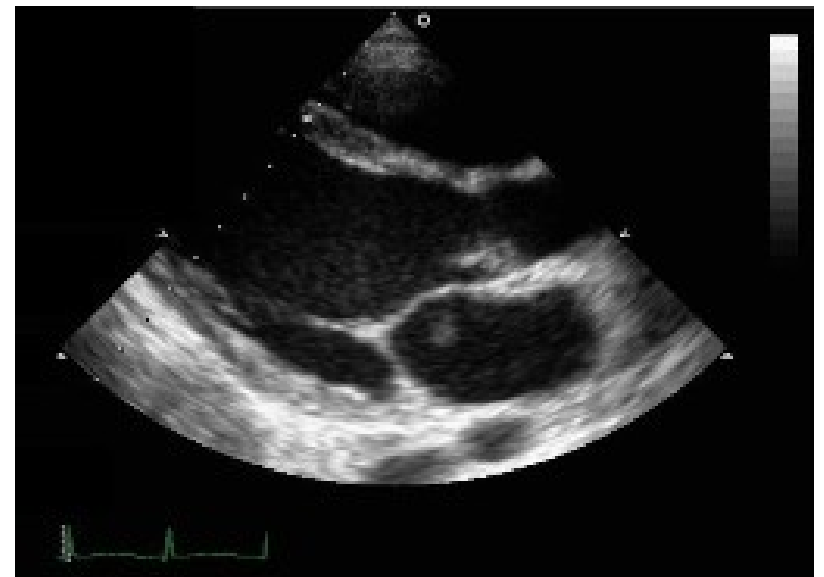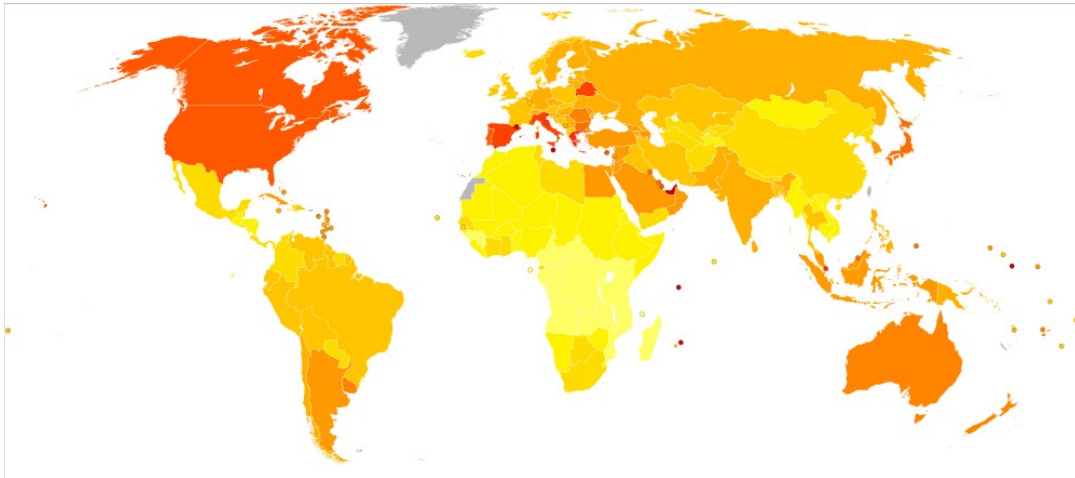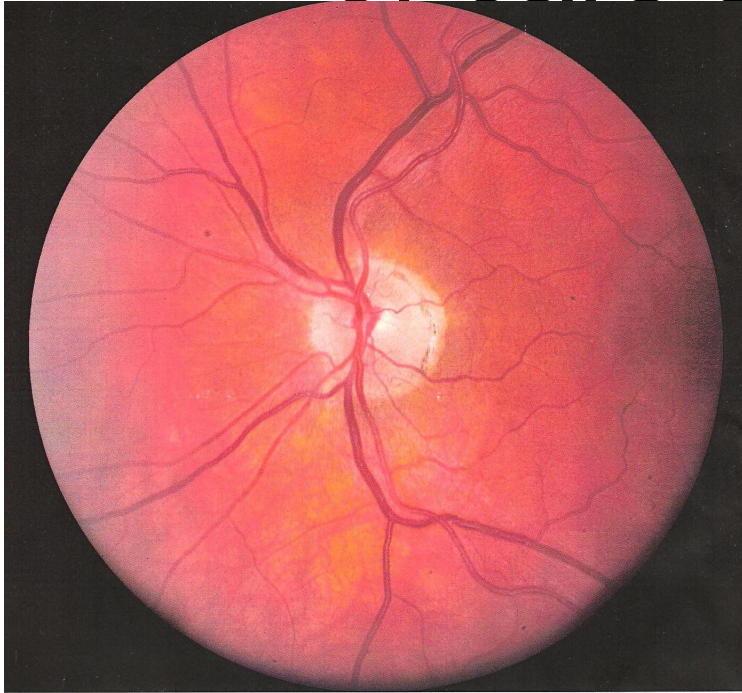
Our software

- Protected by copyright law
- Licensed freely
- Uses open standards (SIP, ZRTP)

GNU Free Call – till next time!

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David Sugar, principal architect

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www.gnutelephony.org

GNU Free Call

– peer-to-peer mesh calling
for public services

You

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Discover Hurd

Sources

- Free images from Wikimedia Commons, commons.wikimedia.org.

- Statistics from www.gapminder.org.

- Telecommunications infrastructure in disasters: prepairing cities for crisis communications, Townsend, Moss, New York University, 2005.

- Hurricane Katrina: communications & infrastructure impacts, Miller, National Defense University.

- Why Haiti's Cellphone Networks Failed, Corley, IEEE Spectrum, February 2010.

- Christchurch earthquake: summary of telecom actions, Murphy, Telecom New Zealand, Group, March 9, 2011.

- Japan Phone Operators Report Poor Services After Earthquake, Businessweek, Yasu, Shiraki, March 11, 2011.

Good afternoon, everyone. I am Haakon Meland Eriksen and work as the project coordinator of the GNU Free Call project. We have begun to assemble a solution for secured, decentralized, peer-to-peer emergency calls.

GNU Free Call was chosen as the best eHealth innovation using Free Software on March 22nd 2011 at the GoOpen conference in Oslo by the Norwegian Open Source Centre and Driv Inkubator. We think our solution in cars and cell phones may be of help after natural disasters, but also in our regular lives.

We are planning a humanitarian foundation to ensure independence and promote commercial services around our solutions.

Overview

- About us
- Consequences of natural disasters on telecommunication
- How GNU Free Call can help
- Collaborating partners
- A healthnet of cars and cell phones
- Time for questions

I will first present the people in the project, say something about its origins by telling you about the concequences of some natural disasters in the last five years, then say something about how we believe GNU Free Call in the future may help people in similar situations, and briefly sketch out how a healtnet of cars and cell phones built on GNU Free Call can provide private communication between patients and health personell.

Who we are

- Free Software Foundation has the
  GNU Telephony project,
  GNU Telephony has GNU Free Call.

- David Sugar, principal architect, USA

- Haakon Meland Eriksen, project
  coordiantor, Norway

- Contributors have come forward from
 Australia, Ukraine, Brazil, Norway
  and more.

David Sugar is the principal architect behind the software. He
lives in New Jersey, USA, and last year he was one of the
finalists in Cisco's network competition, but had to decline
further participation in the contest, because they wanted to
make the software proprietary. Unfortunately, Hurricane Irene
is moving towards David's house, and a state of emergency
has been declared in his county, preventing him from
attending here today.

I am the project coordinator. I live and work in Drammen as a
teacher at Galterud skole, a high school in a part of Drammen
called Fjell. I used to work at the Norwegian Centre for
Integrated Care and Telemedicine and at the Norwegian
Healthnet as project manager, communications adviser and
board member.

The tsunami in the Indian Ocean on December 26th
2004 hit Thailand with tremendous force. Tourists
from many countries were also affected. In Sri
Lanka and in Indonesia the tidal wave caused
enourmous destructions. The image shows us a
Japanese volunteer in Indonesia, where over 100
000 people died. As we all know, this year, Japan
was hit by both earthquakes and a tsunami. The
aid work around the Indian Ocean was hampered
by a lack of tools for communication and
coordination, which led to the creation of the first
Free Software for humanitarian aid, Sahana. What
Sahana did for coordinating aid at the
organizational level, we hope to do for
communication at the level of the individual.
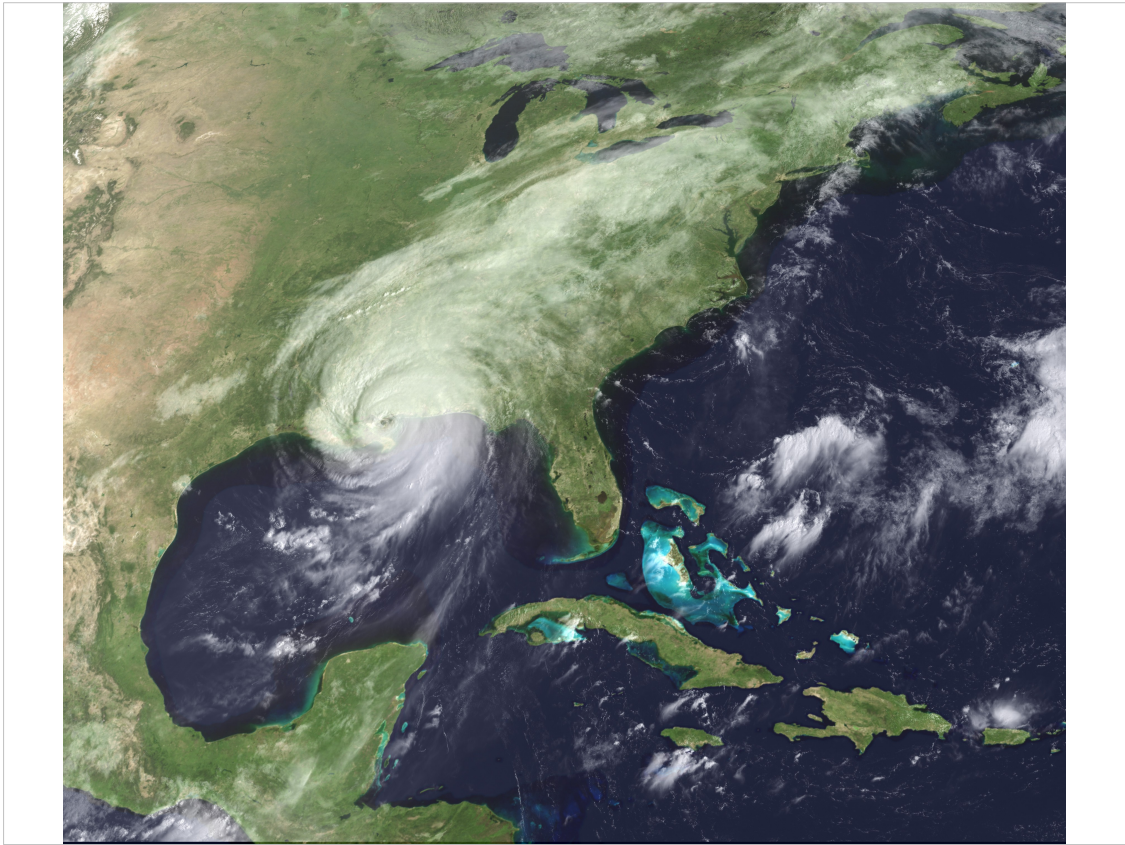
The satellitte image shows the hurricane Katrina as it hit New Orleans in USA five and half years ago. From this height it may not look that bad. Please notice the dark blue spots towards the top of the image – those are the Great Lakes on the border to Canada. Right now, let us hope hurricane Irene will spare the houses of David's family and many others.

This was the situation on the ground. In August 2005 the USA was hit by one of the largest natural disasters experienced in any industrialized country since World War II. The report from the federal communications commision gives us an insight into the severety of the situation. The hurricane Katrina knock out more than three million phone lines in Alabama, Louisiana and Mississippi. The regular phone network was badly damaged. Many central public offices and a large number of businesses in a large area were damaged or destroyed by the hurricane or the flood that came after it. Local wireless networks also suffered enormous damage – more than 1000 cell phone towers were knocked out of service by the hurricane. When the hurricane was at its worst, more than 35 public answer services were unavailable, and in some counties in Louisiana people were without 911 or extended 911 (E911) service for several weeks. It has been estimated that close to 2000 people died.

Last Irene - 1999

Irene yesterday

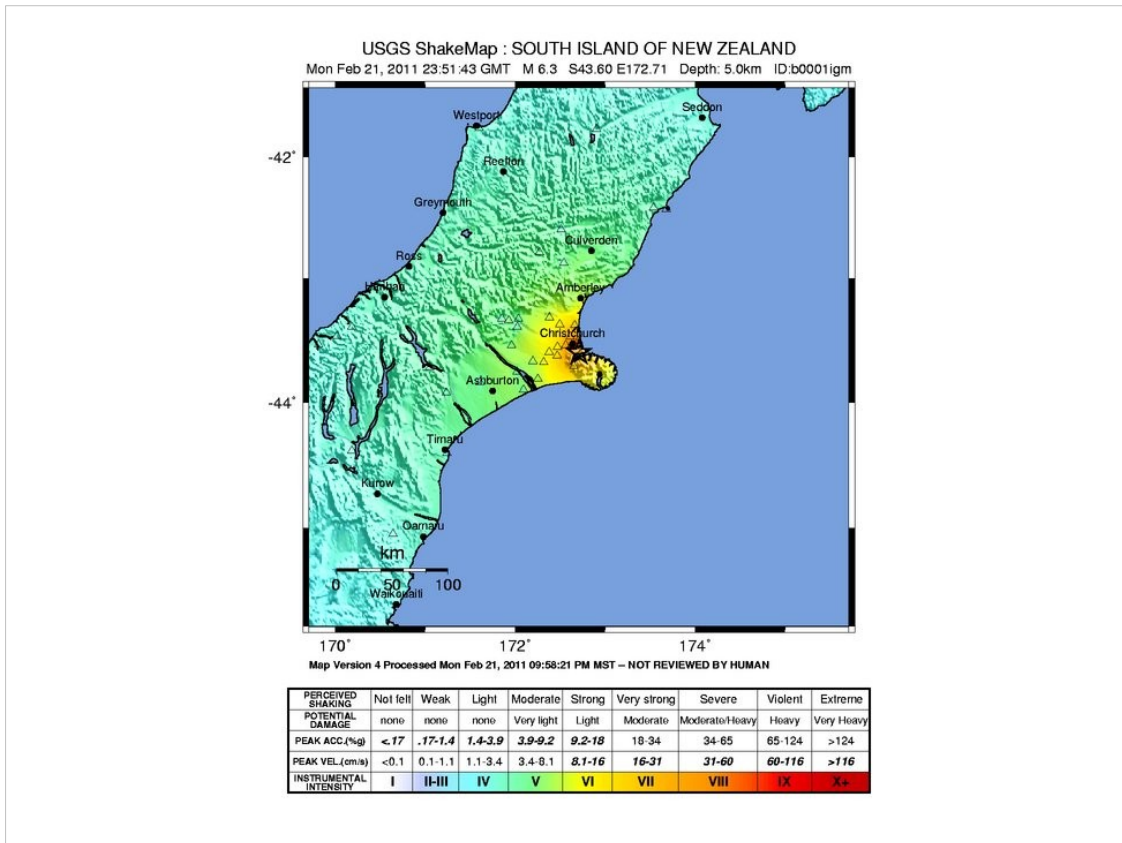The map shows the epicentre of the earthquake that hit Haiti in January last year, one of the world's poorest countries. Average life expectancy is 61 years, in contrast to 83 in Japan. Average income in USD is 1198 in contrast to 29681 in Japan. In other words, the country does not have a good economy to handle such a disaster in contrast to Japan. Just in case you wondered, the numbers are 81 years and 47915 for Norway.

January 12th 2010, Haiti was hit by the most powerful earthquake there in 200 years, and one year later the goverment announced that over 316000 people died. The population number of Haiti was about 9,7 million. Telecommunications before the earthquake was divided between the publically owned Teleco with 100 000 subscribers on regular phone lines and the cell phone companies Haitel with 200 000, Comcel with 1 000 000 and Digicel Haiti with 2 000 000 subscribers. Just after the earthquake only Haitel worked. In other words, there were 3 000 000 subscribers without service. Digicel reported that 70% of their cell phone towers worked, but these were in areas of Haiti not affected by the earthquake. 30% of the cell phone towers were in the capital Port-au-Prince, and these were knocked out. Those who were trapped in collapsed buildings by the earthquake tried to call family and friends without getting through. This, and the fact that it was in the afternoon and people were on the move – shopping and so on – made it very difficult to know where they were, and caused many deaths.

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This is Christchurch in the Canterbury region on New Zealand. February 22nd of this year, the area was hit by a large earthquake. 850 hours were spent down man holes to repair 58000 cables to give 10000 subscribers their phone service back – after two weeks.
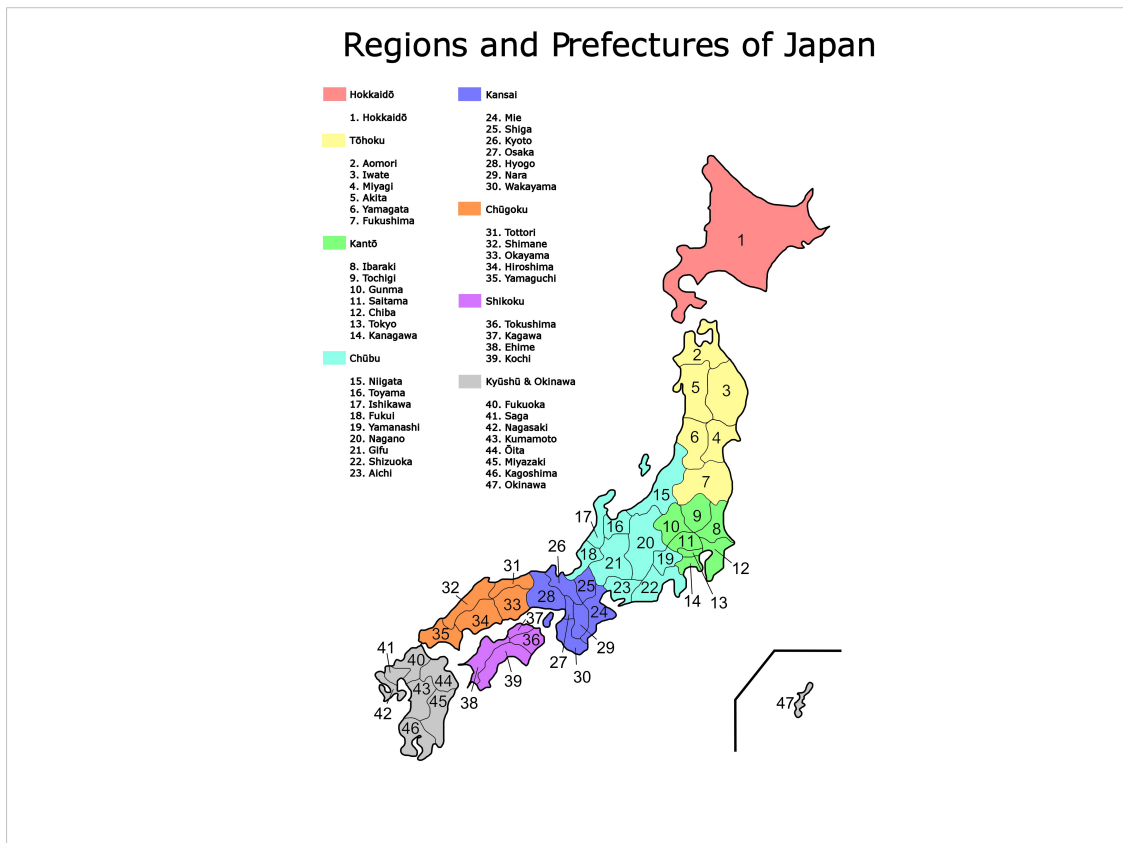
Christchurch was flooded.
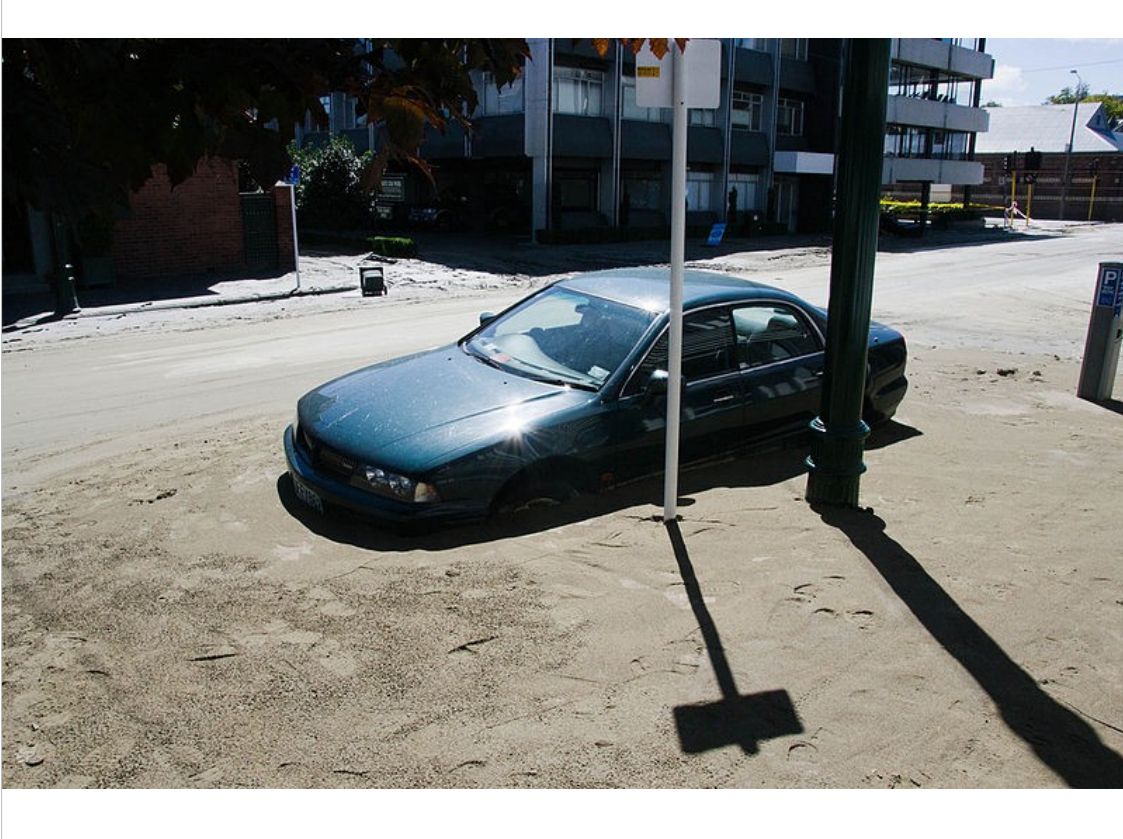
The ground was shook into a liquid like state in
 addition to the flood. It could not have been easy
 to get to the man holes.

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March 11th, Japan was hit by a violent earthquake that caused a tsunami. NTT DoCoMo Inc., KDDI Corp. and Softbank Corp., the three largest cell phone operators in Japan, said that their service was disrupted across many regions because the quake shook buildings over large parts of the country. Wireless service is not readily available, and phone services in the Tohoku, Kanto and Tokai regions were bad. The Oshika peninsula in the Miyagi region was closest to the epicentre, and is number 4 on this map. More examples, like the flood in Pakistan and in a smaller scale in Norway too this summer could be given, but I will move on. We have had our own misfortunes.

How telecommunications break down

- Physical destruction of network parts
- Interruption of supporting functions
- Traffic jams or network overload

During disasters the telecommunications infrastructure fails in many different ways. Research into communications failure after large urban disasters in the past fifteen years show three main categories of reasons:

1. Physical destruction of network parts. This is both time consuming and costly to fix. In this category are destruction of towers, cables and so on.

2. Interruption of supporting functions. Among these, access to power the most important, but unfortunately it is also the one were disruption has the worst effect. In second place is water cooling systems, which does not work when water pipes break, and in third place is destroyed transport systems, which prevents diesel transport to backup systems.

3. Traffic jams, overload and queing in the network. Many of us have probably experienced to try to call someone on New Year's Eve unsuccessfully on your cell phone, and that SMS messages arrive several hours later. Crisis releases a strong human need to talk to each other – to coordinate help, to communicate news and information about groups and individuals, and as a panic reaction to the crisis. Historically, large disasters are the most intens generators of telecommunications traffic, and this strong need can overload even the most well maintained network. During this workload, calls are blocked and messages lost.

GNU Free Call
– the freedom to call out
when you really need it

As you understand, it is often a challenge to give basic medical help in such environments. In a state of emergency, time is counted in minutes and hours. Medical personnel need to communicate, and they need do this in private to ensure their patiens dignity.

Our goal is to solve this by developing and setting up self-organizing, decentralized, secured, peer-to-peer calling networks. With GNU Free Call, you and health personnel will have the freedom to call through cars and cell phones nearby.

Even in a poor country like Haiti there were many who had a cell phone in their pocket, often sent from family members abroad. Yet they could not reach anybody. Imagine if they could have made a call through each other. That is what we have tried to illustrate in the video conversation above. We want GNU Free Call in cars because of battery capasity. One push on the red warning button, and the car provides emergency calls.

Collaborative partners in Free Software

- Individual contributors
- Village Telco – offers telephony solutions in developing countries in unlicensed spectrum where GSM is hard to come by and expensive. www.villagetelco.org.
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- Sahana? Haakon made a Norwegian translation of an older version. We will contact them. www.sahana.lk.
- OpenStreetMap? www.openstreetmap.org.

Since our launch March 14th, we have been contacted by individuals who want to help, and by similar free software projects. We are still finding out how we can collaborate. We have some groups like Sahana relief system and OpenStreetMap that we want to contact, but this has not been done yet.

David and I are planning to start a humanitarian foundation to ensure independence and to provide commercial services around GNU Free Call as free software.

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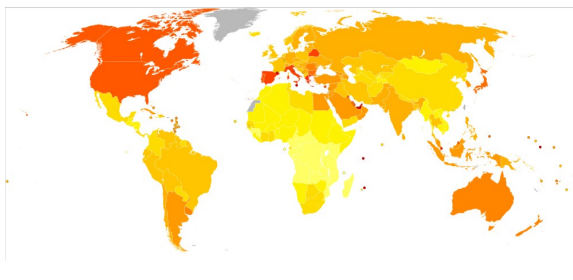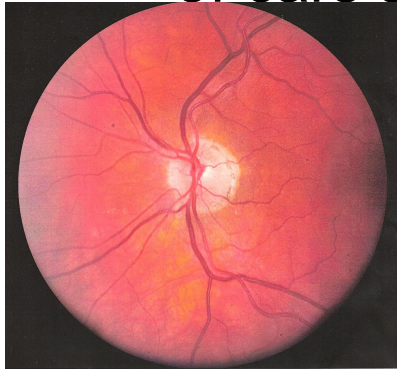
Lastly, I want you to picture phones with specialized user interfaces built on GNU Free Call used by everyone for regular private communication between their doctor or hospital.

From the Norwegian Centre for Integrated Care and Telemedicine, we know that images through the pupil of eye can be used to diagnose diabetes and prevent blindness. We know that images of skin diseases kan be used for follow up care or to ask for a second opinion. Diabetes is the 6th largest killer in the US, after cancer and heart failure – murder is way down on the list. What prevents health personnel on the move to use an ultrasound device through their phone to examine and and communicate information about the heart in our bodies or a child in the womb?

Our software

- Protected by copyright law
- Licensed freely
- Uses open standards (SIP, ZRTP)

Our software is free software, because we believe in software freedom and that secured software needs to be peer reviewed.

We believe that open standards will ensure vendor independence and compatible solutions.

Many of the images you have seen contain cars. Even if they are stuck, their batteries may last between 24-48 hours after a natural disaster.

We want to see emergency calling networks and mobile infrastructure through cars and cell phones, and we would like to invite you to help us reach this goal.

GNU Free Call – till next time!

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David Sugar, principal architect

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GNU Free Call
– peer-to-peer mesh calling for public services

You

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Discover Hurd

Thank you for your attention!

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Sources

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