

Japan and JP registry's experience of earthquake, tsunami, and nuclear plant accident

AP* Retreat Meeting

2 September 2011

Hiro Hotta <hotta@jprs.co.jp>

contents

- What happened in Japan
- How the Internet was used
- DNS traffic change caused by the disaster
- What JPRS experienced
- What JPRS should do to be prepared for the future disaster

What happened in Japan

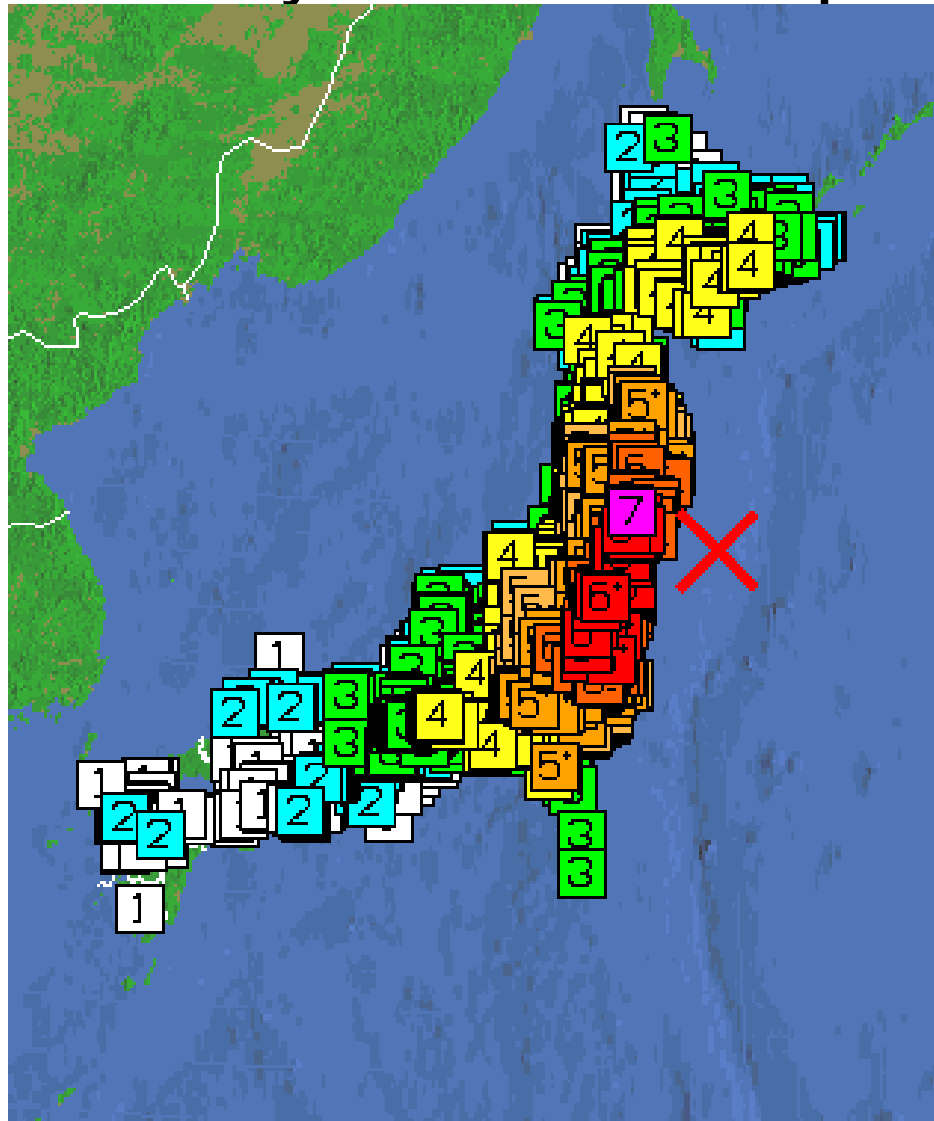
Where is Japan?



What happened (1)

- Earthquake
 - Friday, March 11, 2011 14:46 JST
 - Earthquake center 38.322N, 142.369E (in the Pacific Ocean)
 - 130Km east south-east of Ojika Peninsula
 - 500Km north-east of Tokyo
 - intensity=7 (based on the Japanese scale 0-7)
 - 5+ in central area of Tokyo
 - magnitude 9.0
 - buildings collapsed by quakes, buildings slanted by land liquefaction, roads/railroads severed, lifelines severed, ...
 - Tsunami
 - came 30-90 minutes (depending on the places) after the earthquake
 - height ~9 meters on the sea
 - ran up land slopes to 30-40 meters high
- more than 20,000 dead or missing

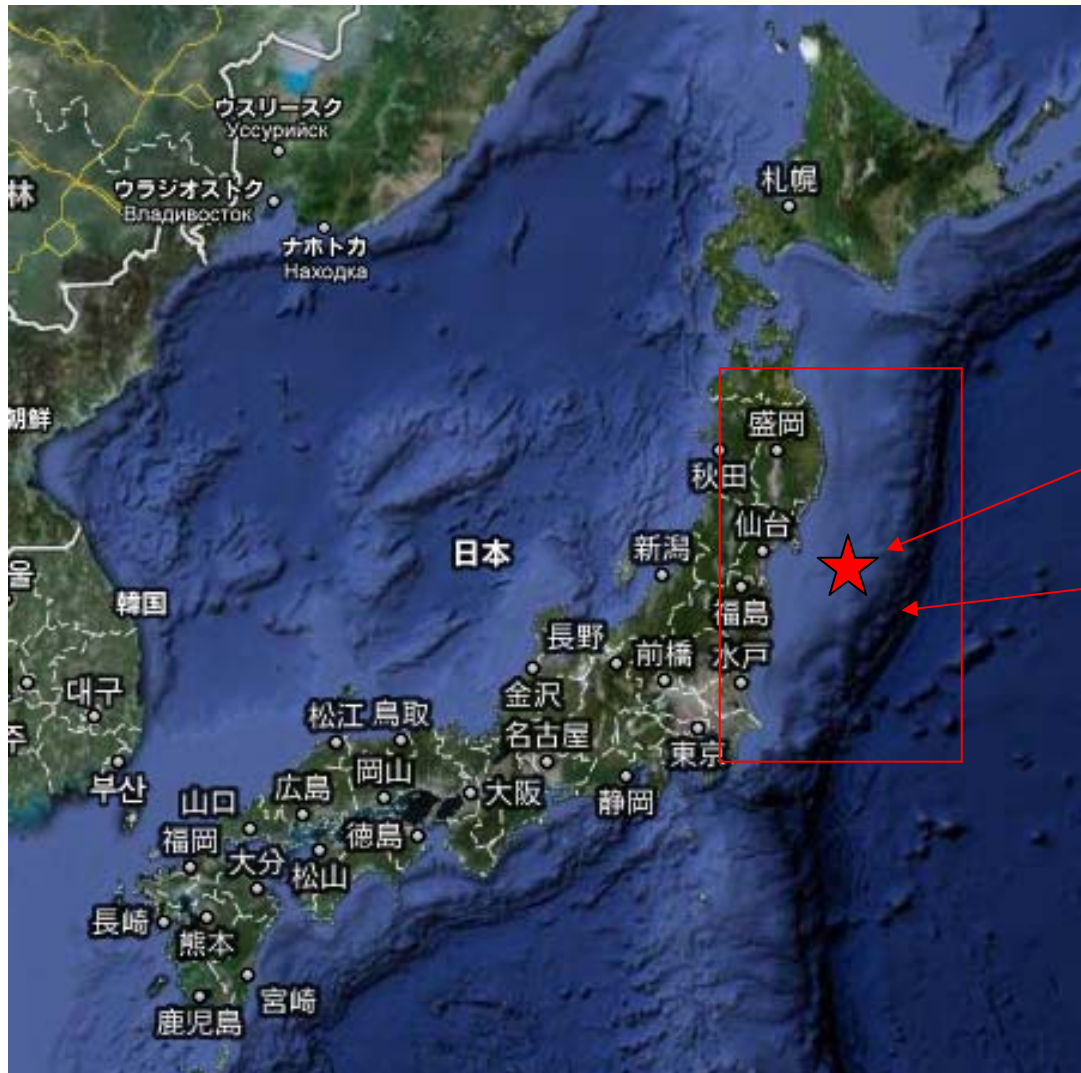
Intensity of the Earthquake



✕ earthquake center

- 1 -sensitive people feel the quake
- 5+ -dishes fall from racks
-wodden walls/columns get damages
- 7 -cracks in the ground
-buildings collapse

How tsunami propagated



earthquake center
- 30 meters land slide

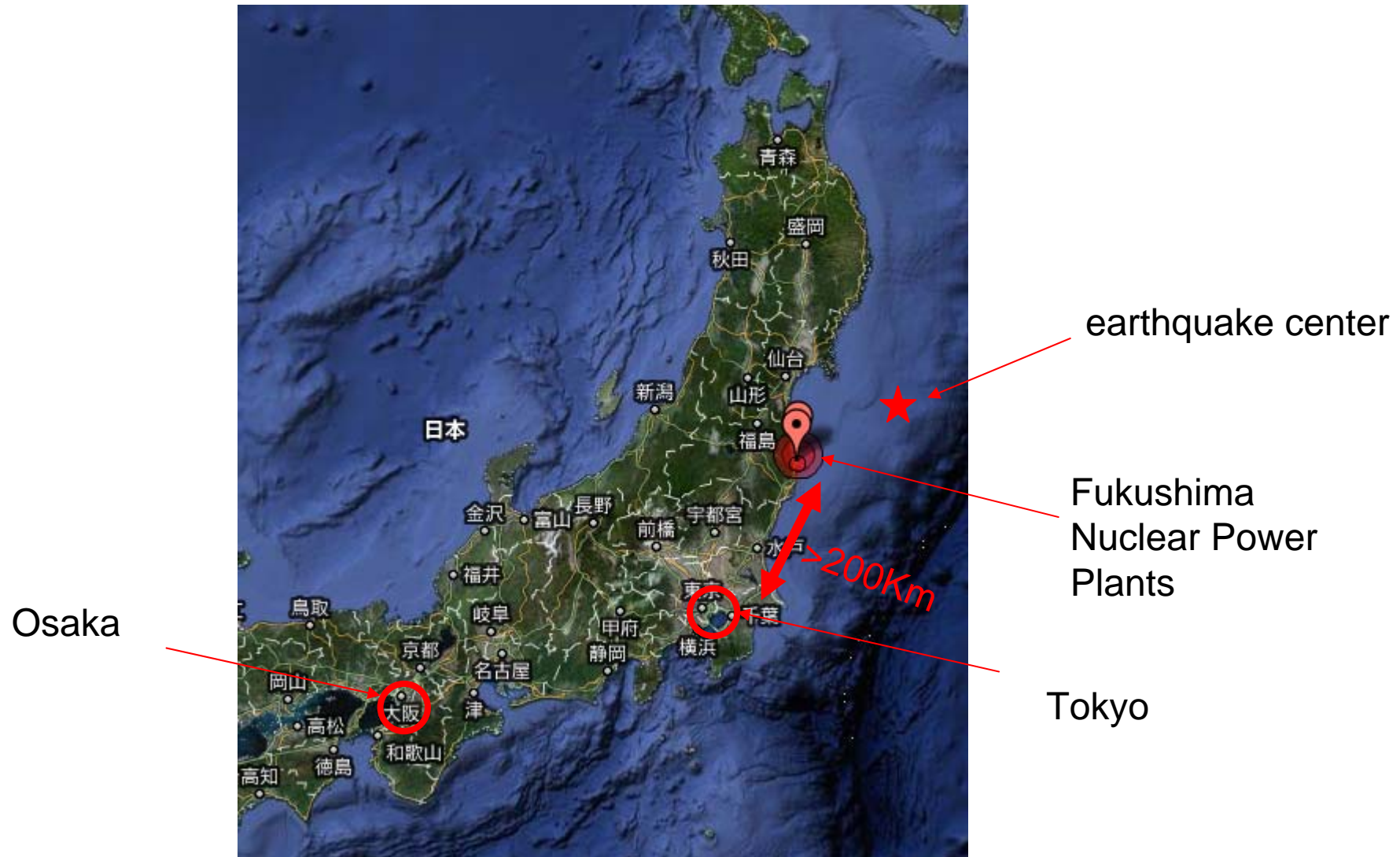
Japan Trench
- more than 40 meters
land slide in the trench

http://iisee.kenken.go.jp/staff/fujii/OffTohokuPacific2011/tsunami_prop_ja.html

What happened (2)

- Nuclear power plants disaster
 - Nuclear power plants on the coast of Fukushima prefecture were hit intensely by earthquake and tsunami
 - government, power company, academicians, ... call it "unexpected circumstances"
 - emergency situation occurred
 - broken by earthquake
 - broken by tsunami
 - explosion of power plant buildings
 - operation disabled for control system or cooling system
 - radiation leak
 - immediate power shortage predicted
 - fear for power shortage due to outage of Fukushima plant in combination with failure of other power-related facilities
 - flash lights, candles, batteries, ... went sold-out

Where are Fukushima nuclear plants



How the Internet was used

Characteristic Internet usage

evacuation sites person search (Yahoo!)

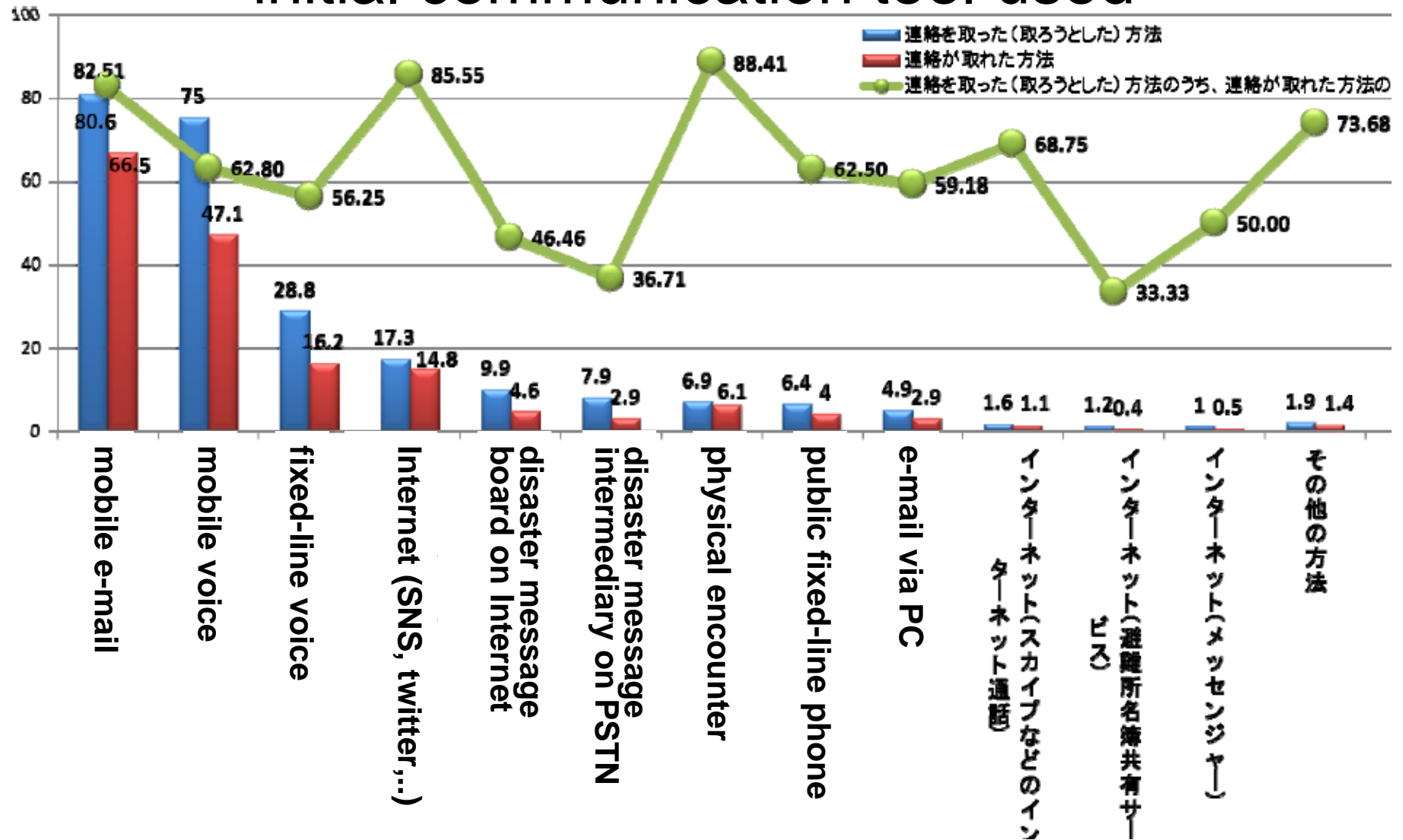
The screenshot shows the Yahoo! Japan homepage with a focus on disaster relief. The main header features the text '復興支援 東日本大震災' (Recovery Support Great East Japan Earthquake) and 'みんなががんばろう 日本' (Everyone let's do our best Japan). Below this, there are navigation links for '震災情報' (Disaster Information), '復興支援' (Recovery Support), '節電情報' (Energy Saving Information), and '原発情報' (Nuclear Power Information). A QR code is provided for mobile access. The main content area is divided into several sections: '被災された皆さまへ' (To those affected by the disaster), '被災地を支援されたい皆さまへ' (To those who want to support the disaster-stricken areas), and '二次避難者支援情報' (Information on support for secondary evacuees). The '公式避難場所名簿検索' (Official Evacuation Site Namebook Search) section shows 236,862 registered entries. The '緊急災害募金' (Emergency Disaster Fundraising) section displays the current fund amount as 1,415,804,092 Yen and the number of donors as 904,250. There are also links to 'ボランティア情報' (Volunteer Information) and '被災者の受け入れに関するニュース' (News about accepting victims).

person finder (Google)

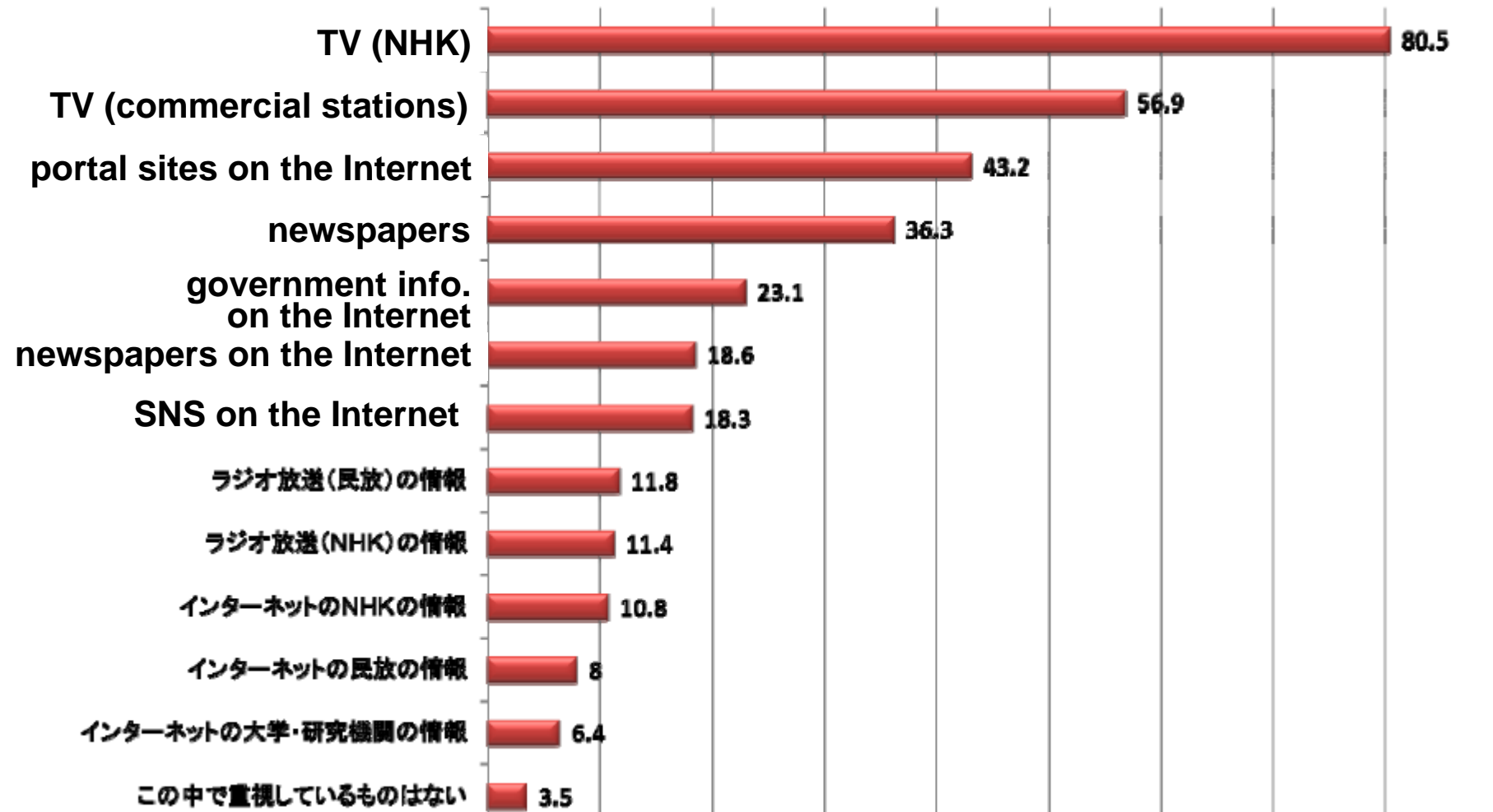
The screenshot shows the Google Person Finder interface for the 2011 Great East Japan Earthquake. At the top, it says 'Person Finder (消息情報): 2011 東日本大震災'. There are language selection options: 日本語 | English | 한국어 | 中文(简体) | 中文(繁體) | Português (Brasil) | español | Tiếng Việt. Below this, there are two buttons: '人を探している' (I am looking for people) and '消息情報を提供する' (I am providing contact information). A message states: '現在、およそ 624100 件の記録が登録されています。' (Currently, approximately 624,100 records are registered). There is a link to '動物の消息情報' (Animal contact information) and a shortened URL: 'http://goo.gl/sagas'. At the bottom, it says 'powered by Google'.

注: 入力したデータはすべて公開され、誰でも表示、使用できる状態になります。また、消息データには、直接、ユーザーがパーソナルファインダーに入力した情報のほか、公開された情報その他の情報源に基づき入力された情報が含まれています。Google では、これらのデータの正確性の確認は実施しておりません。

initial communication tool used

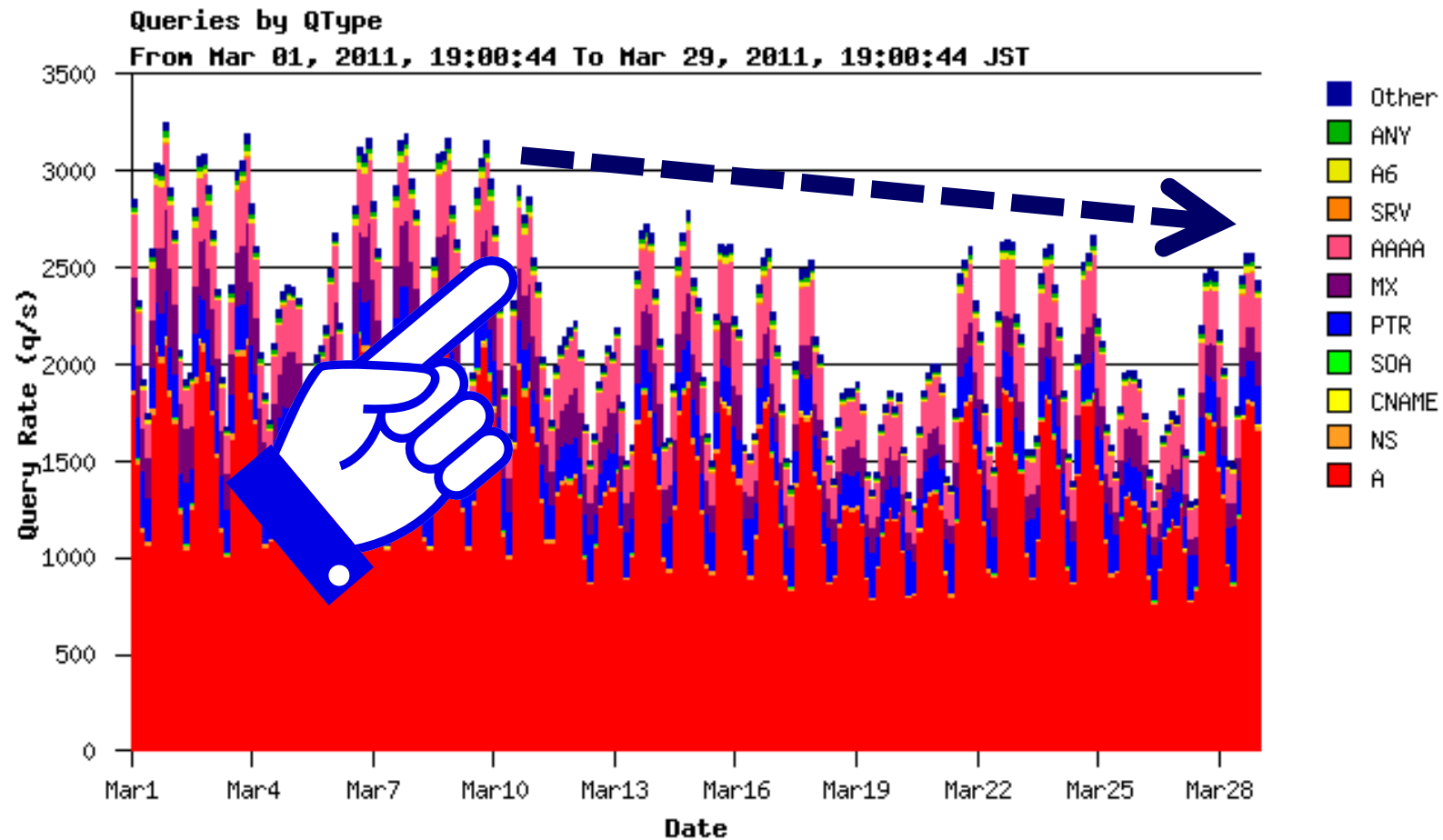


important media regarding this disaster

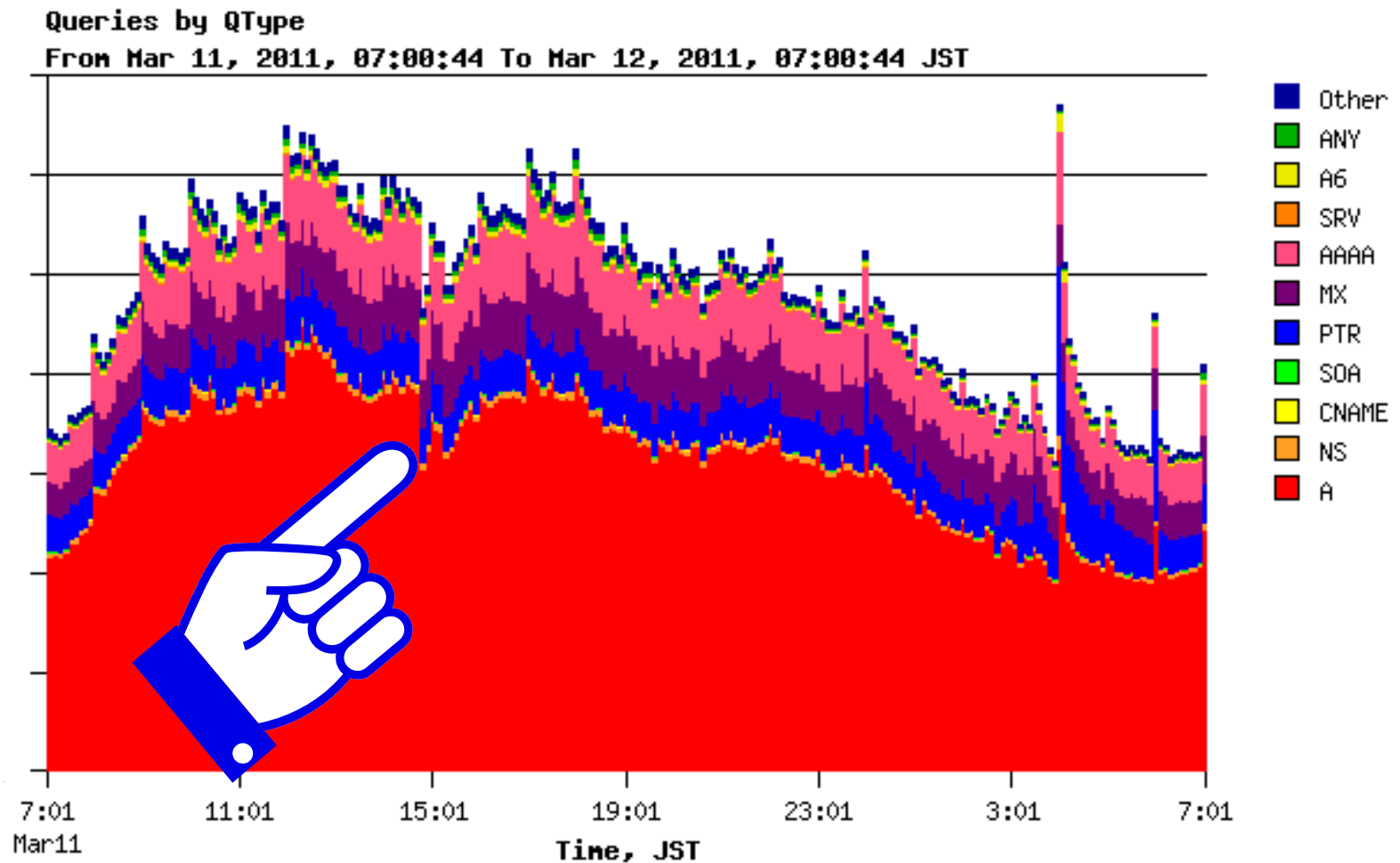


DNS traffic change caused by the disaster

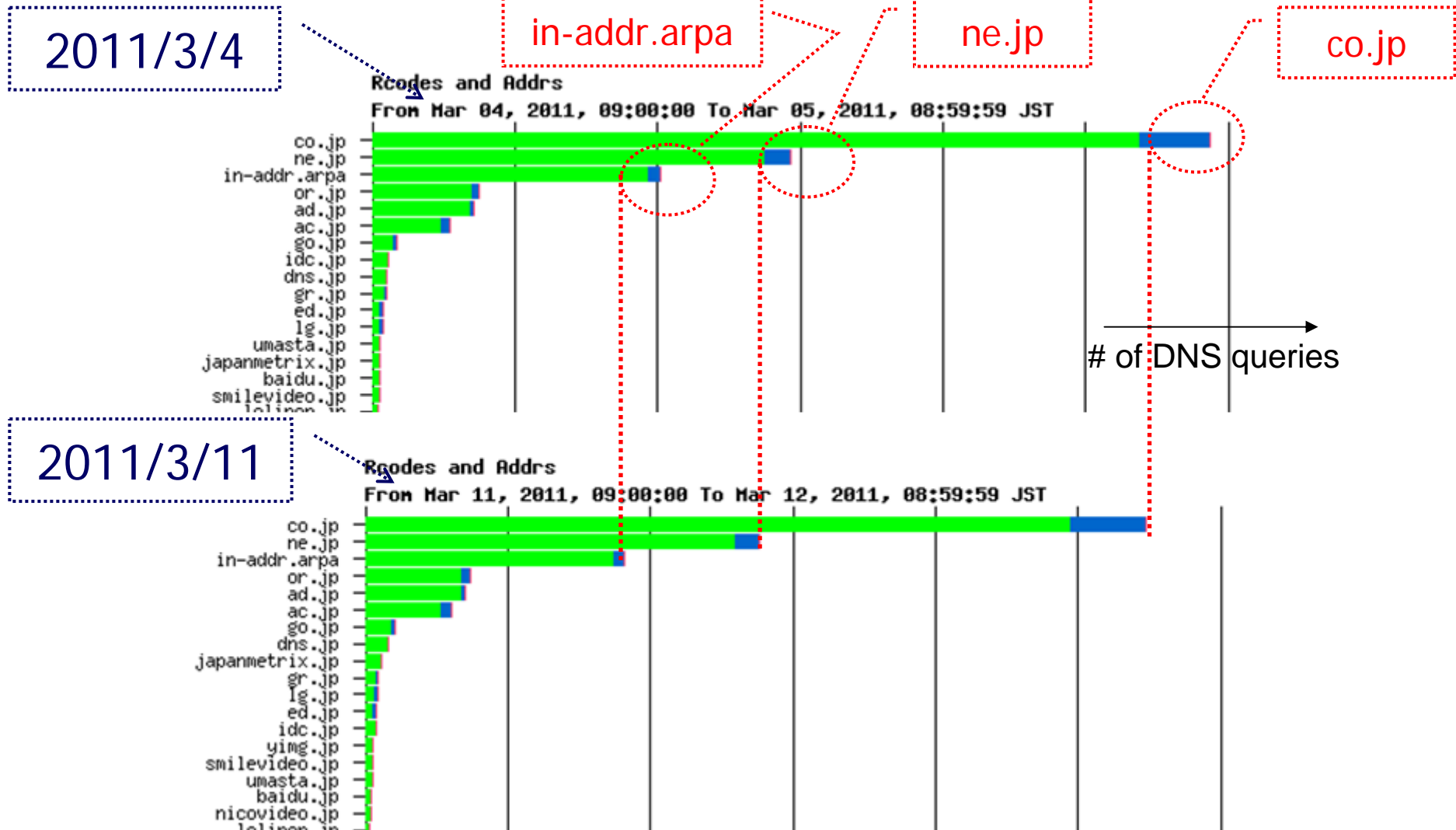
Number of queries before/after the 'DAY'



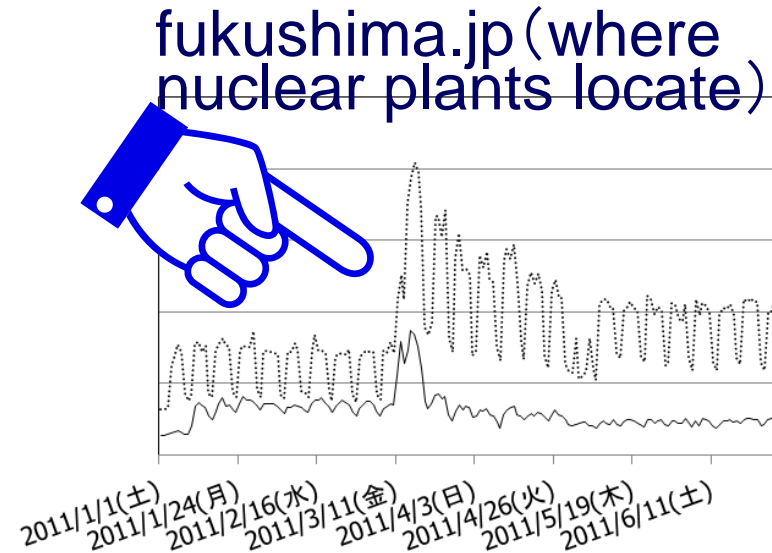
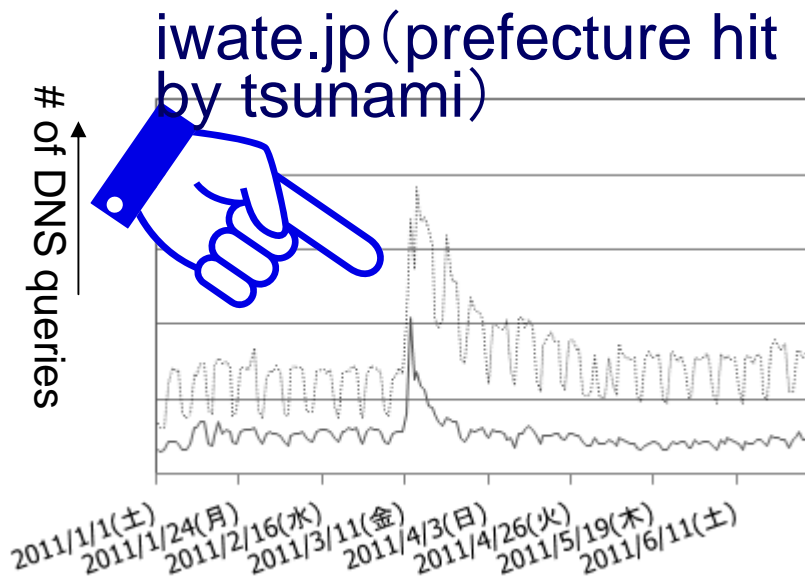
Number of queries : 24 hours



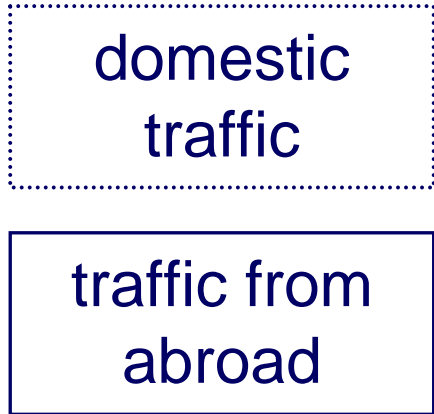
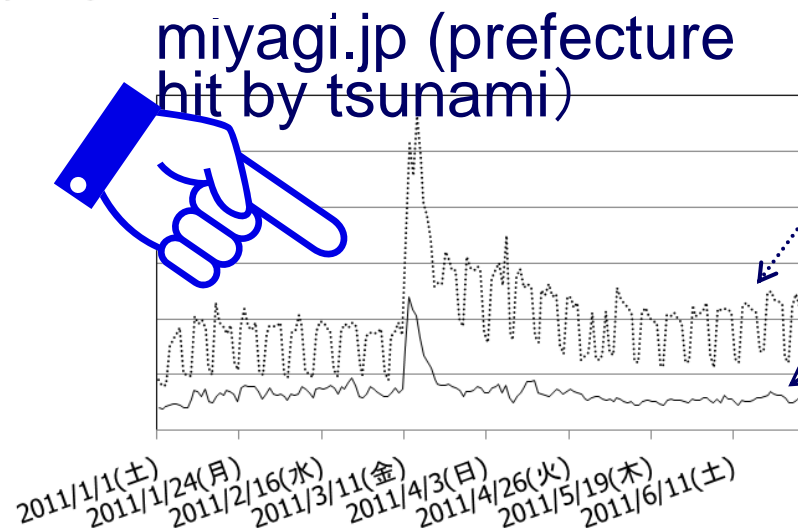
Traffic before/after the 'DAY' (1)



Traffic before/after the 'DAY' (2)

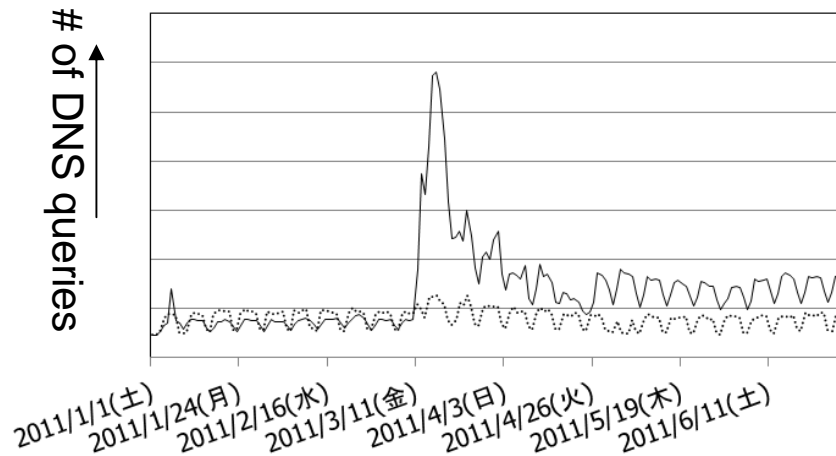


notation:
YYYY/MM/DD

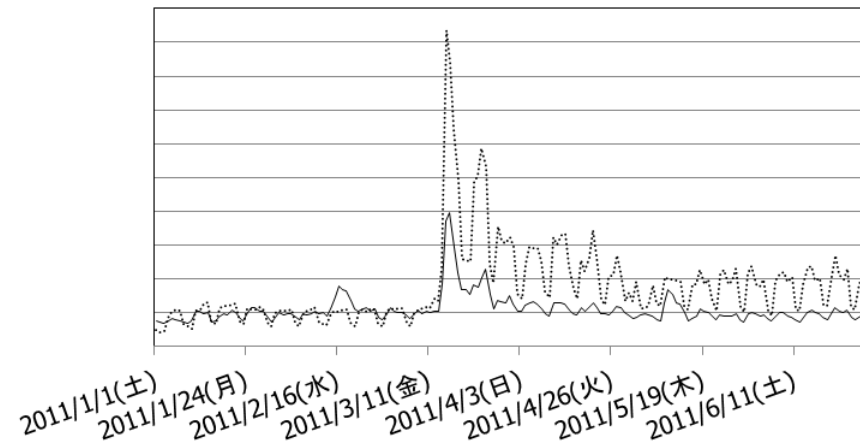


Traffic before/after the 'DAY' (3)

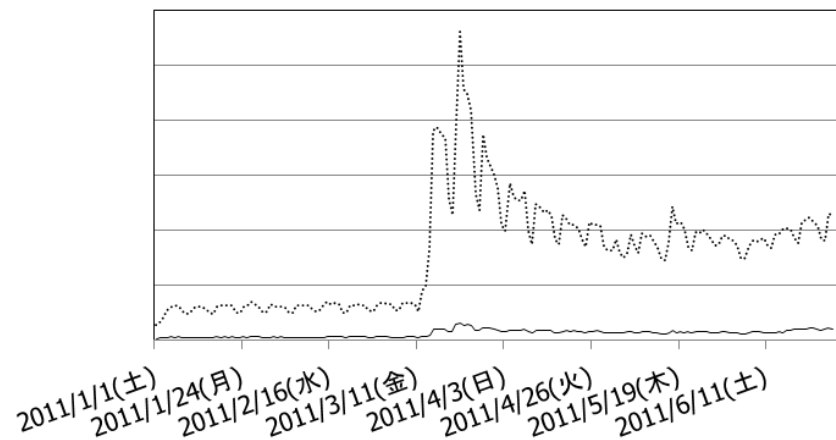
Kyodo News Service



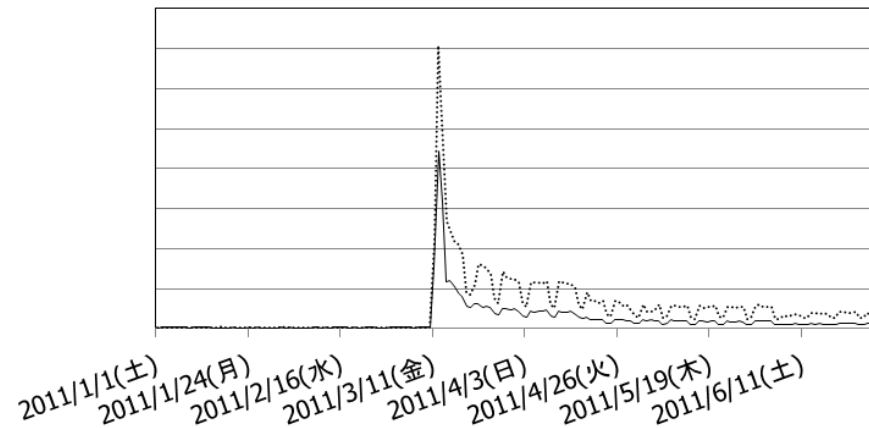
National Institute of Radiological Sciences



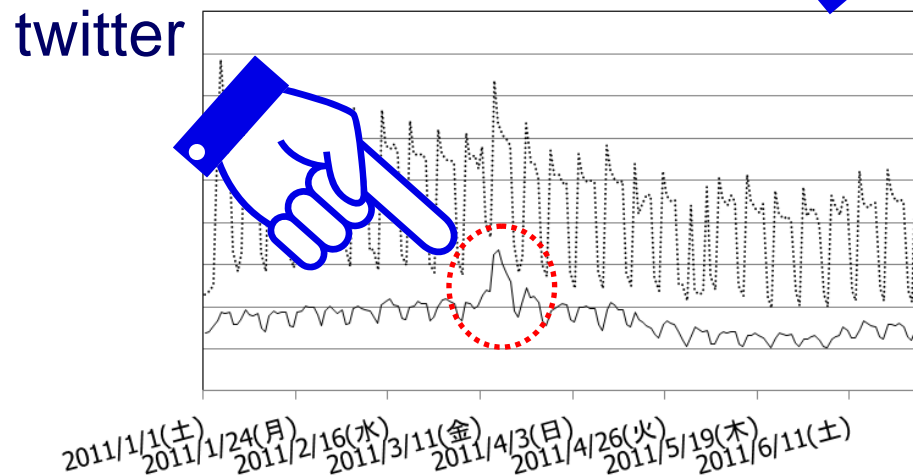
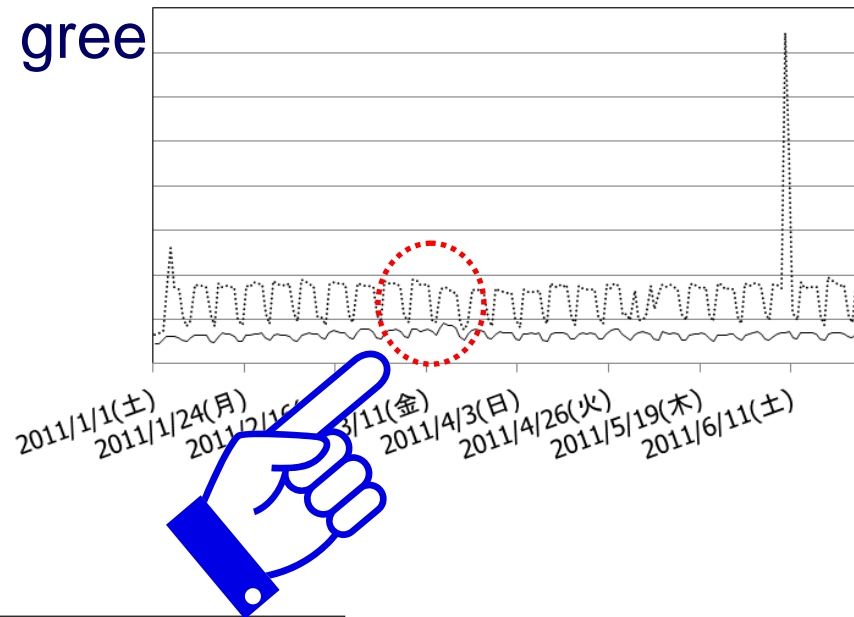
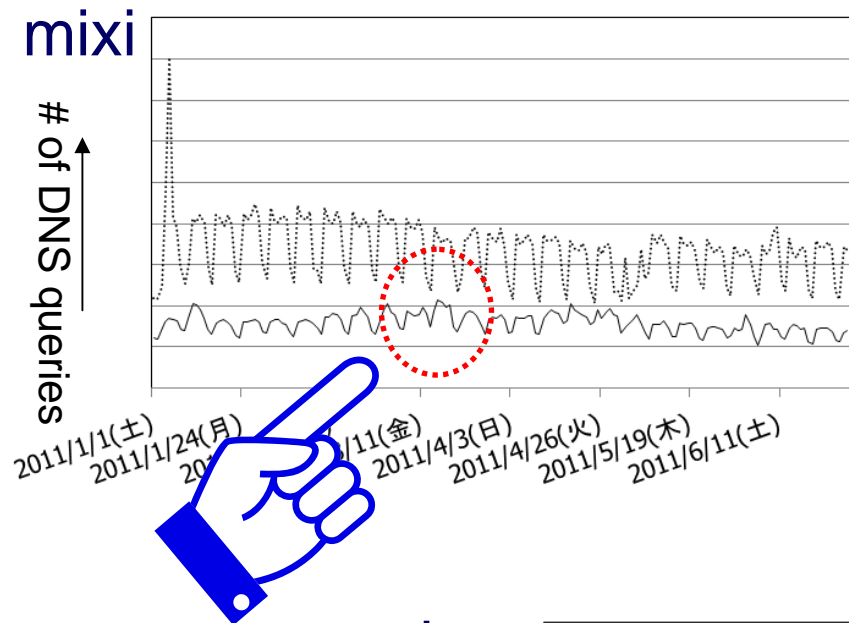
a delivery company



a message board dedicated to

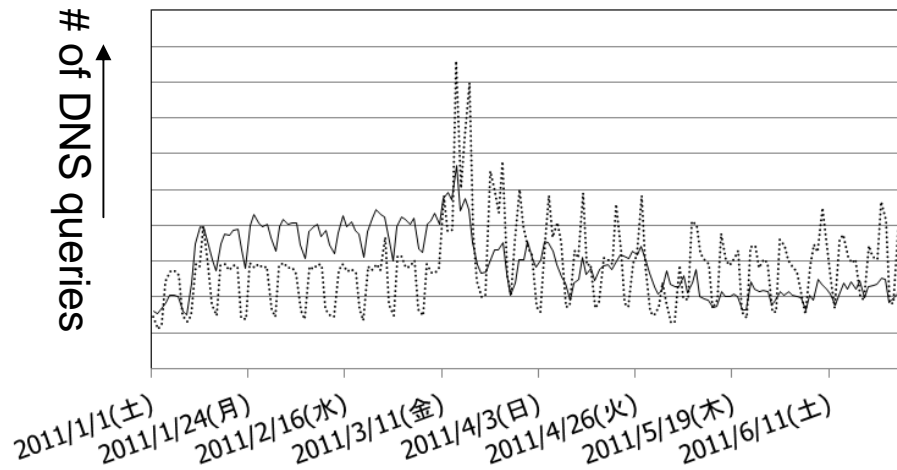


Traffic before/after the 'DAY' (4)

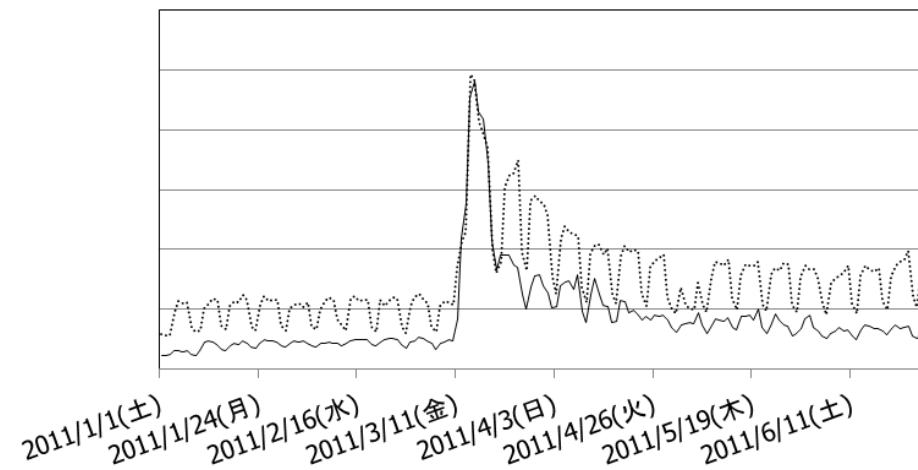


Interest in Electric Companies (in general)

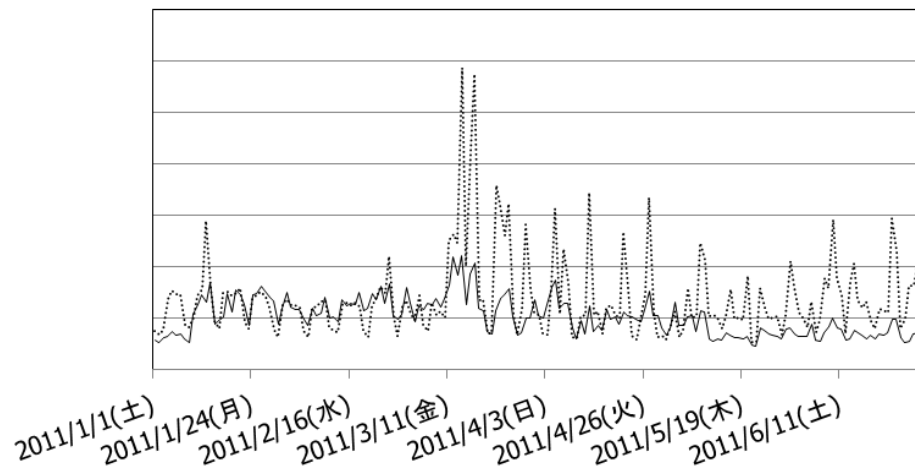
Kyushu Electric Company Ltd.



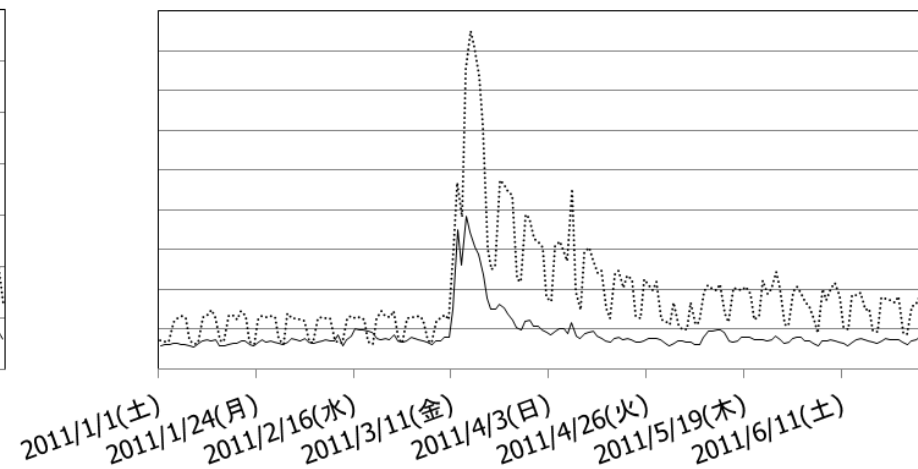
Tokyo Electric Company Ltd.



Okinawa Electric Company Ltd.



Tohoku Electric Company Ltd.



Interests in Electric companies from abroad

'11/3/10	'11/3/11	'11/3/12	'11/3/13	'11/3/14
Japan	Japan	Japan	Japan	Japan
United States	United States	United States	United States	United States
Australia	Australia	Philippines	Philippines	Philippines
Russian Federation	Germany	China	Germany	Germany
India	China	Germany	China	Australia
Korea	Hong Kong	Australia	Australia	United Kingdom

What JPRS experienced

Difficulties JPRS experienced (1)

- on the day of earthquake
 - some facilities/goods were broken or fell down by the earthquake
 - not easy to spot all employees while checking their safety
 - even it was business hour
 - some were outside the office to attend meetings / to visit customers / ...
 - some took days off (due to holidays / sickness / ...)
 - communication was difficult
 - phones (fixed line, mobile) were heavily congested and people couldn't grab lines / waves
 - even staff-safety-check service prepared for this kind of emergency didn't work (because of communication congestion!)

Difficulties JPRS experienced (2)

- on the day of earthquake *(continued)*
 - just after the big quake, all sorts of problem-finding must be done immediately
 - safety in the office
 - continuity of the service
 - DNS, WHOIS, registry system, office system, ...
 - servers in the office, servers in data centers, NOC function, ...
 - => fortunately, JP service was not disrupted
 - => some office facilities got damages
 - employees couldn't go back home
 - public transportation stopped their operation because they had to do thorough safety checkups after an intense earthquake (5+ in Tokyo)
 - road congestion because many people tried to get home by cars as public transportation systems were not available
 - 30-40 staffs stayed overnight with blankets and sleeping bags
(over 120,000 people couldn't travel home in Tokyo area)

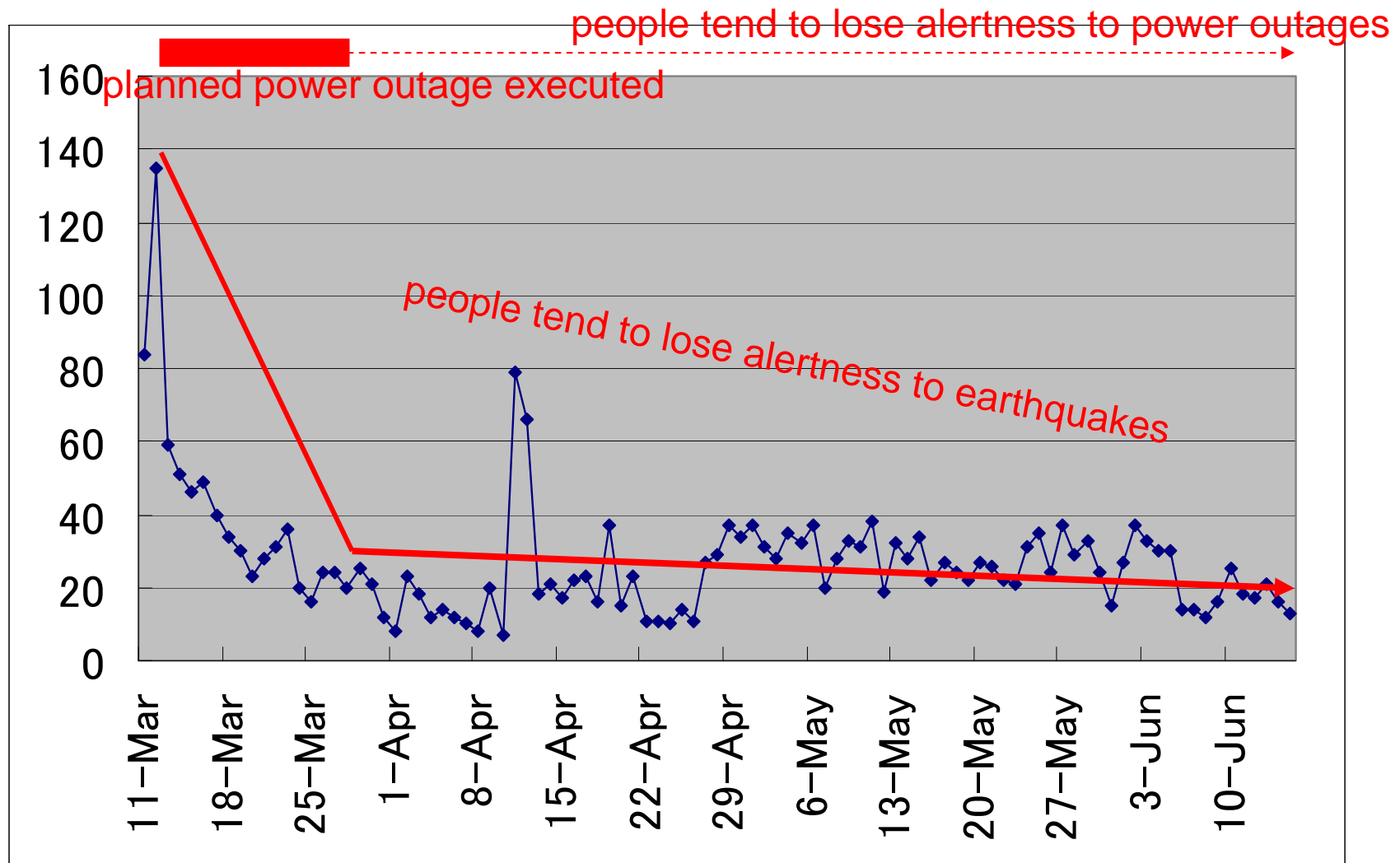
Difficulties JPRS experienced (3)

- during several days after the earthquake
 - not all the public transportation services were back to normal
 - some railway lines were severely damaged
 - partial/reduced operation for the purpose of electric power save
 - still in the same situation as of today
 - planned electric power-down was executed, rotating among designated areas
 - the area JPRS locates in was not among the designated areas
 - employees living in designated areas were
 - directed to work from home (although their PC connection couldn't survive)
 - released from the office early enough to reach home safely even they came to the office to work
 - the ministry directs people to stay home as far as possible in order for them to avoid troubles and save electric power

Difficulties JPRS experienced (4)

- during several days after the earthquake
(continued)
 - decide how domain names should be handled
(=relief)
 - people (registrants / registrars) in the disaster-affected area may not be able to renew their domain names
 - such domain names will be automatically renewed with no charge
 - announce to the public was not done
 - since some registrars could not extend the above relief to their registrants
 - registry revenue decrease should be estimated
 - to what extent the domain name market will shrink
 - how much revenue decrease the above relief will yield?

Number of noticeable earthquakes per day



data from http://www.seisvol.kishou.go.jp/eq/shindo_db/db_map/indexemg.html

what JPRS should do to be
prepared for the future disaster

Situations JPRS should have prepared for (1)

- earthquakes
 - earthquakes at the same/higher level of intensity as we have experienced - probability was not low - still not low
 - difficulty in commuting
 - in case staffs must stay in the office for a while (e.g., 1 week)
 - in case staffs must stay at home for a while (e.g., 1 week)
- power outage - not have happened by now
 - Government said it would intend
 - not to place any planned power outages this summer
 - to help infrastructure level services to get fuels for their emergency power supply facilities
 - but ... as it doesn't mean 100% guarantee, we have to prepare for
 - planned power outage
 - sudden power outage

Situations JPRS should have prepared for (2)

- avoiding power shortage of Japan
 - 15% power-cut by mid-small offices is demanded by the government
 - 20% power-cut by large power consumers (such as big factories) is demanded by the government
 - until September 22
 - recently it's moved forward to September 9

Short term preparation (1)

- for staffs' initial immediate movement after disaster
 - set up various kinds of communication channels among staffs and office building managers
 - phones, e-mails, twitter, skype, web-sites, ...
 - walkie-talkies, ...
 - improve manuals
 - evacuation, staff safety check, periodical roll call, damage inspection (physical / service grade), ...
 - purchase and maintain emergency survival kit
 - food/water/gloves/helmet/light/... for individuals
 - sleeping bags/radios/... for office stayers
- for company's initial essential decision
 - set up basic criteria for
 - making staffs to go home
 - making staffs to come to office
 - how to treat visitors

Short term preparation (2)

- for company's emergency organizational structure
 - decision making / field commanding
 - not all decision makers/commanders are expected to be available
 - information acquisition/sharing structure (who/how/why)
- for registry service / company operation
 - set up service levels
 - according to damage
 - according to power outage scale
 - who are to be in the office in each service level
 - who will be informed about our service status
- for company operation with remote staffs
 - establishment of remote connection environment in emergency circumstances
 - how to manage staffs who are in remote (even manager is in remote)
 - how executive meetings are convened in what cases

Short term preparation (3)

- for normal business operation with 15% power-cut
 - dimming lights, office machines with stand-by mode, ...
 - set airconditioner target temperatures to 2 degrees higher (28 degree Celsius = 82.5 degree Fahrenheit) than usual summer target
 - allow staffs to be dressed more casually (= loosely:-)
- for unplanned power failure
 - check how to manually control electric-driven devices
 - to unlock electrically locked doors, to unlock electrically locked safety boxes, ...
 - check what functions are going down in power failure and install UPSs to facilities that shouldn't be interrupted
 - purchase and maintain emergency survival kit
 - food/water/gloves/helmet/light/... for individuals
 - sleeping bags/radios/... for office stayers

Short term preparation (4)

- for organizational initial decision
 - set basic priorities to
 - functions to survive
 - who are going to do what
 - set up basic criteria of
 - making staffs to go home
 - making staffs to come to office
 - how to treat visitors

Summary

- short term preparation
 - to prepare for
 - another big disaster
 - power failure
 - sudden power failure
 - planned power failure
 - designated power save
 - 15-20% power save (directed by government)
 - to complete the preparation before this summer
- long term preparation
 - systems for registry services through remote operation by staffs
 - preparation for more intense disasters
 - disaster recovery plan with systems and human resources for typical cases

Q & A