

# Damage from the Tohoku-Pacific Ocean Earthquake and future prospects

March 30, 2011

Nippon Telegraph and Telephone East Corporation



«Kesen Ohashi, Iwate Pref.»



«Kitakami Building, Miyagi Pref.»



«Unosumai Building, Iwate Pref.»



«Rikuzen-Takata area, Iwate Pref.»



«Kesennuma area, Miyagi Pref.»

## ■ Relay transmission lines

- Disconnected in 90 routes\*

\* Except for nuclear power plant area

## ■ Exchange office buildings

- Demolished: 18 buildings
- Flooded: 23 buildings

## ■ Telephone poles destroyed by flood, collapsed

- 65,000 poles in the coastal region

## ■ Aerial cable destroyed by flood, physically damaged

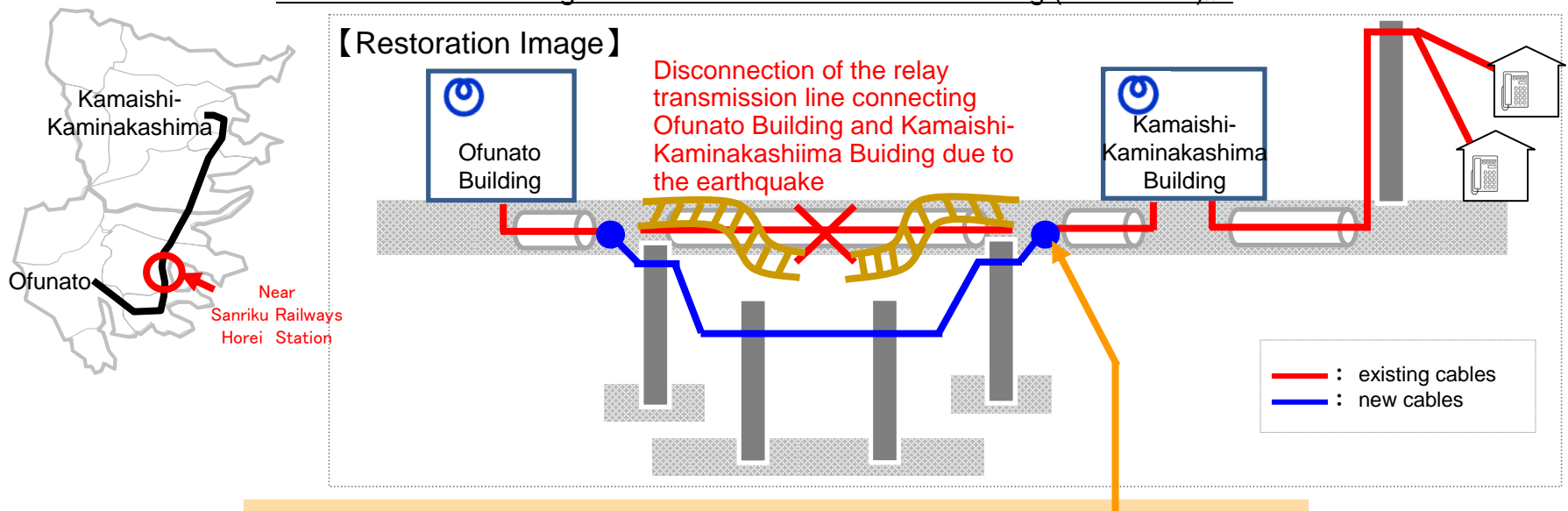
- 6,300 km in the coastal region

# Securing relay transmission lines

- Establish backup relay routes or switch routes to achieve connectivity at disrupted points or to bypass damaged relay transmission lines.
- Main relay transmission lines to be secured through the aforementioned measures.

Example of restoring transmission through the establishment of a backup relay route

《from Ofunato Building to Kamaishi-Kaminakashima Building (Iwate Pref.)》



【Photographs showing the installation process】

Cables were disconnected along with the Sanriku Railways' railroad track. 11 new poles were erected for the new cabling.



Connection of the core cabling between the existing cable and the backup relay route cable.



■ Damage and restoration status of the exchange offices with discontinued services (55 buildings) are as follows.

Degree of damage		Number of buildings*1	Method of restoration	Expected restoration date
A	Only minor damages to buildings, but power supply facilities are damaged by flooding, etc.	16	Replacement of power supply facilities, adjustment of exchange facilities, replacement of failed parts, etc.	Mid-next week
B	Significantly damaged relay transmission lines due to a collapsed bridge	4	In addition to case A, reconstruction of transmission lines (construction of backup relay routes and re-erection of poles)	Mid-April
C	Demolished exchange offices and facilities, significantly damaged relay transmission lines, etc.	26	Construction of exchange offices, installation of switches, reconstruction of transmission lines after road restoration	Aiming for late April but may delay*
D	Fukushima Nuclear Power Plant area	9	Once the evacuation order is lifted, confirm the status and take any necessary measures	TBD




\*1 As of March 28, 2011.  
\*2 Details will be announced separately once the timing of restoration is confirmed.

# Restoration policy for exchange offices covering main government building of municipalities

- If the degree of damage is assessed as “C” and the government office buildings of municipalities are located within the area of an applicable exchange office, as a general rule, stopgap repair measures will be implemented within a week and public administration and other important circuits will be restored.

Municipal government office		Locations of government office buildings, etc.	Building	Expected restoration date
Iwate Pref.	Noda-cho	The offices at the government building are open.	Noda	Mid-next week
	Rikuzen-Takata-shi	Main government building is submerged. Temporary office building is built next to the Takata School Lunch Service Center.	Rikuzen-Takata	Mid-next week
Miyagi Pref.	Minami-Sanriku-cho	Main government building is submerged. Temporary office building is built at the Bayside Arena.	Shizugawa	Mid-next week
	Onagawa-cho	Main government building is submerged. Temporary office building is built at the Onagawa Dai-ni Elementary School.	Onagawa	Mid-next week
	Shichigahama-cho	The offices at the government building are open.	Shichigahama	Mid-April

# Service restoration schedule of disrupted buildings

(Legend)  Buildings covering municipal buildings  
 Islands  
 Partial restoration due to temporary emergency measures

## 《Iwate Prefecture》 21 buildings

Municipality/ Building Name		Degree of damage/restoration schedule		
		A Mid-next week	B Mid-April	C* End of April
Noda-mura	Noda	Δ		○
Tanohata-mura	Tanohata	○		
Miyako-shi	Taro			○
Otsuchi-cho	Otsuchi	○		
Yamada-machi	Miyako Yamada	○		
	Miyako Funakoshi	○		
Sumita-cho	Kami Arisu	○		
	Shimo Omata	○		
	Sumita	○		
Rikuzen-Takata-shi	Rikuzen-Takata	Δ		○
	Kamaishi Hirota	○		
	Kesen Yokota	○		
	Kamaishi Yahagi	○		
	Kamaishi			
Kamaishi-shi	Unosumai			○
Ofunato-shi	Ofunato	○		
	Hosoura	○		
	Hikoroichi	○		
	Kamaishi Yoshihama	○		
	Sanriku			○
	Ryori	○		

## 《Miyagi Prefecture》 23 buildings

Municipality/ Building Name		Degree of damage/restoration schedule		
		A Mid-next week	B Mid-April	C* End of April
Kesennuma-shi	Yamada Magome		○	
	Oshima		●	
	Karakuwa			○
Minami Sanriku-cho	Shizugawa	Δ		○
	Tokura			○
	Utatsu			○
Onagawa-cho	Onagawa	Δ		○
	Izushima			●
	Enoshima			●
Ishinomaki-shi	Okawa			○
	Oharahama			○
	Yagawa			○
	Ogatsu			○
	Ojika			○
	Miyagi Kitakami			○
	Aikawa			○
	Ishinomaki Funakoshi			○
	Oginohama			○
	Tashirojima			●
	Ajishima			●
Higashi Matsushima-shi	Nobiru			○
Shichigahama-machi	Shichigahama		Δ	○
Watari-cho	Arahama			○

## 《Fukushima Prefecture》 11 buildings

Municipality/ Building Name		Degree of damage/restoration schedule		
		A Mid-next week	B Mid-April	C* End of April
Iwaki-shi	Hisanohama		○	
Soma-shi	Isobe		○	
Hirono-machi	Iwaki Hirono			○
Naraha-machi	Naraha			○
Tomioka-machi	Iwaki Tomioka			○
Kawauchi-mura	Iwaki Kawauchi			○
Okuma-machi	Okuma			○
Futaba-machi	Iwaki Futaba			○
Namie-machi	Namie			○
	Iwaki Tsushima			○
Katsurao-mura	Katsurao			○

\*Restorations may be delayed in some cases from the original schedule (end of April).



# Example of restoration works (new installation of switching equipment)

## 《Shichigahama Building (Miyagi Pref.)》

- Since the whole Shichigahama Building was lost to floods, a SBM-BOX and IP-BOX (outdoor-use circuit switch) will be installed at the building's original site, to restore services by mid-April.

《Photographs showing the damaged Shichigahama Building》

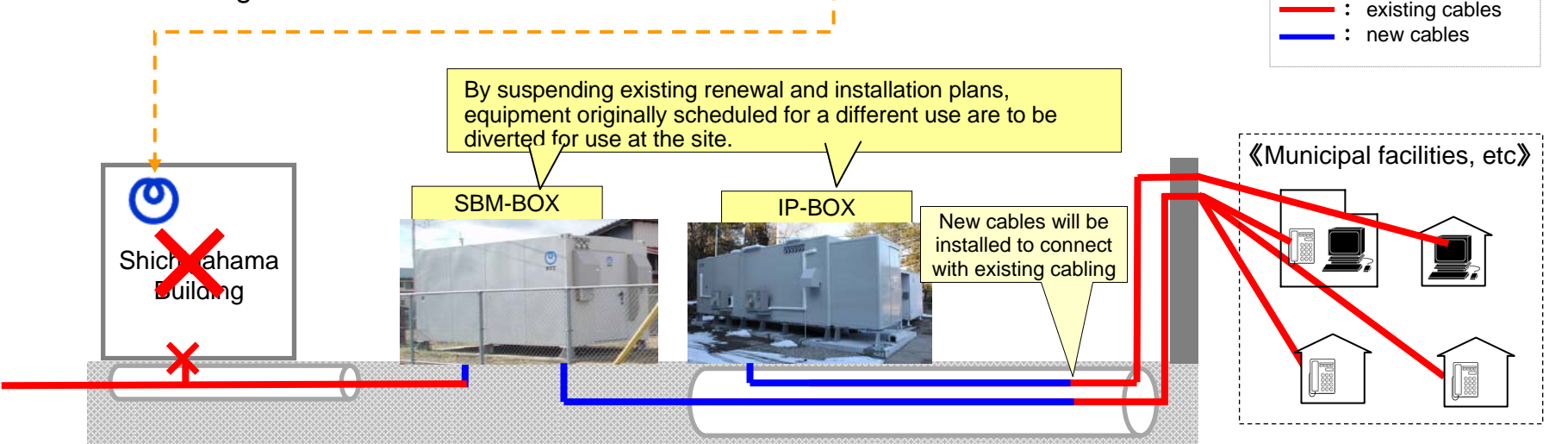


Building was carried 500m away by flood from its original site



\*Tsunami took out the whole building

### 【Restoration Image】



\*SBM : Subscriber Module (Equipment which accommodates PSTN and leased line circuits to be multiplexed and connected to a fiber optic line, connecting to a NTT exchange office building)

# Example of restoration works (backup relay routing + accommodation switch to a different building)

## 《Onagawa Building (Miyagi Pref.)》 ~Service restoration in a specific area~

- Since the Onagawa Building was flooded and damaged, service is scheduled to be restored by mid-next week through the installation of a RSBM-F (outdoor use circuit switch) in the Onagawa Town Disaster Countermeasures Headquarters, and establishing a connection to the Watanoha Building, which is located at a higher layer within the telecommunication network.

### 《Photographs showing the damaged Onagawa Building》



The tsunami greatly damaged the building and flooded the surrounding area

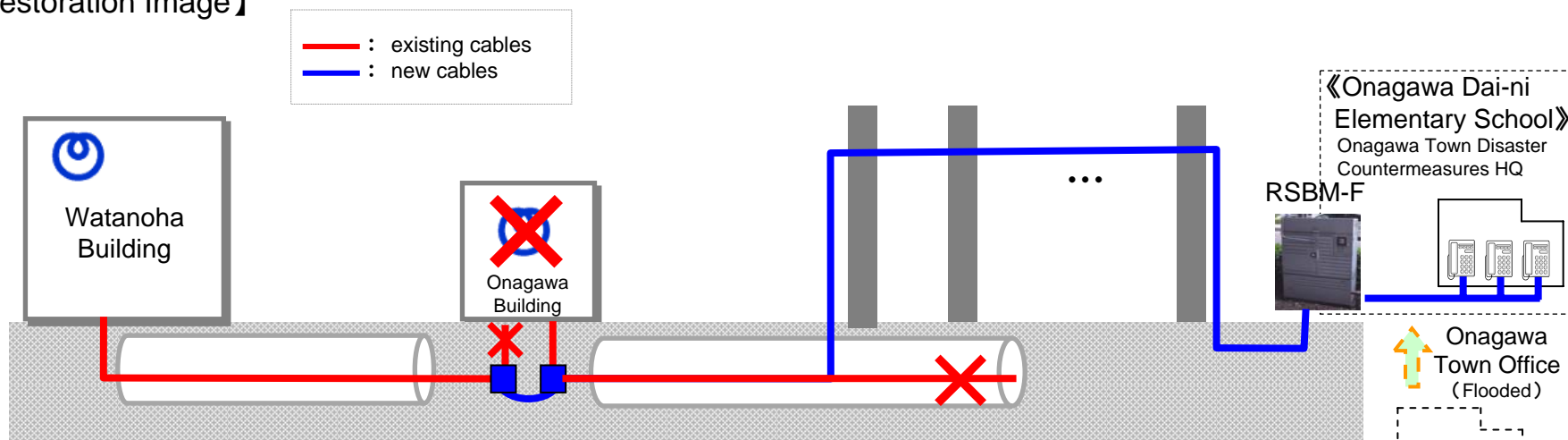


Walls were damaged and the building was filled with driftage



Communication equipment was also damaged by the flooding

### 【Restoration Image】



\*RSBM : Remote Subscriber Module (Equipment which accommodates PSTN and leased line circuits to be multiplexed and connected to a fiber optic line, connecting to a NTT exchange office building)



- Since the Rikuzen-Takata Building is not functioning due to damage from the tsunami, circuits originally situated in this building will be switched to a PSTN circuit switch located in neighboring exchange building for the restoration of services by mid-next week

《Photographs showing the damaged Rikuzen-Takata Building》

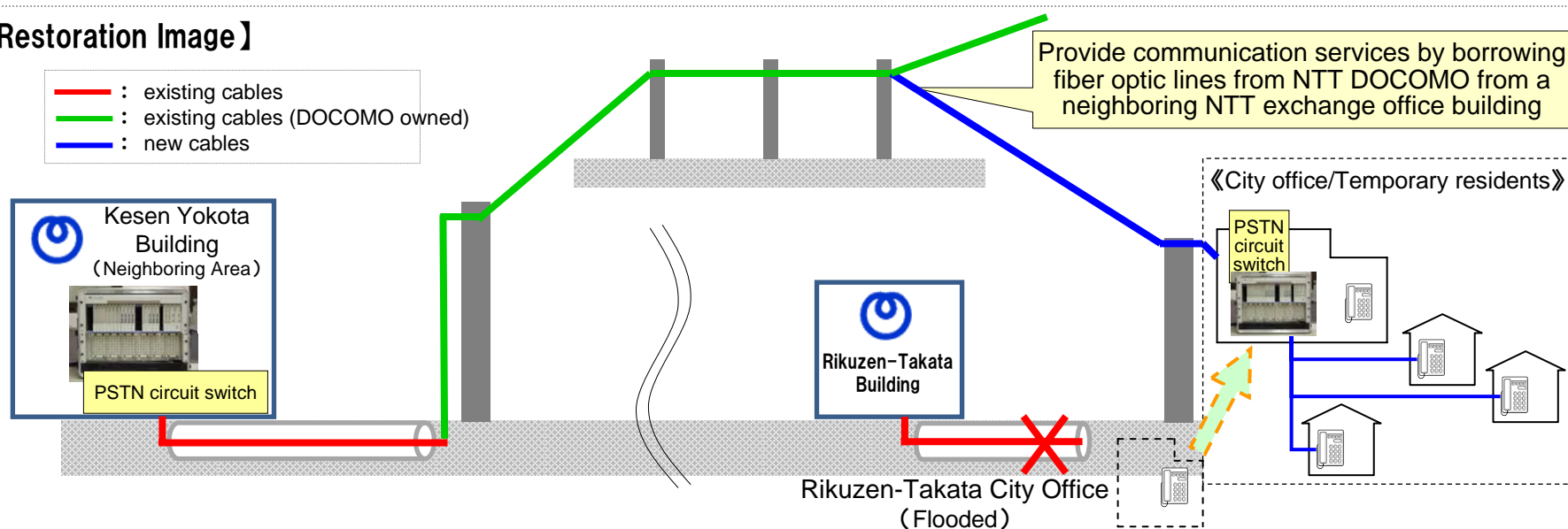


The tsunami greatly damaged the building and flooded the surrounding area



Power equipment was also greatly damaged from the flooding

【Restoration Image】

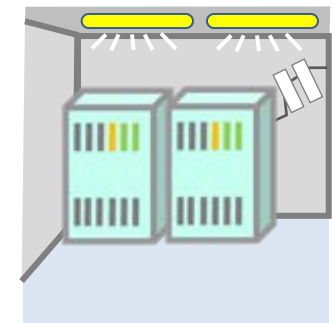
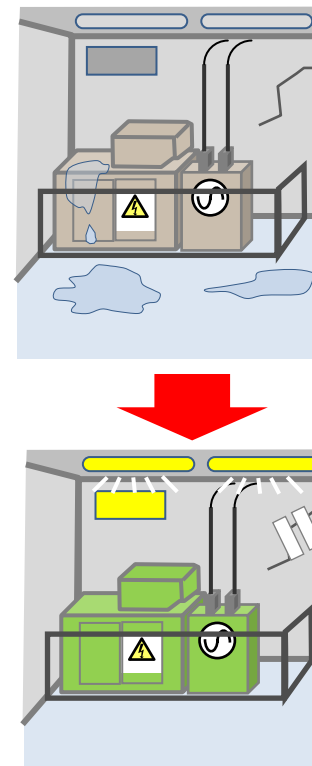
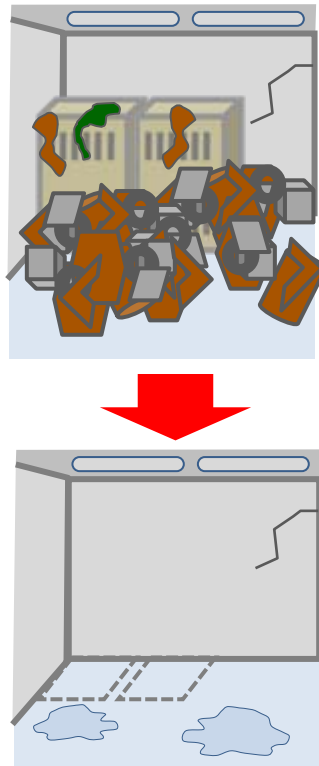
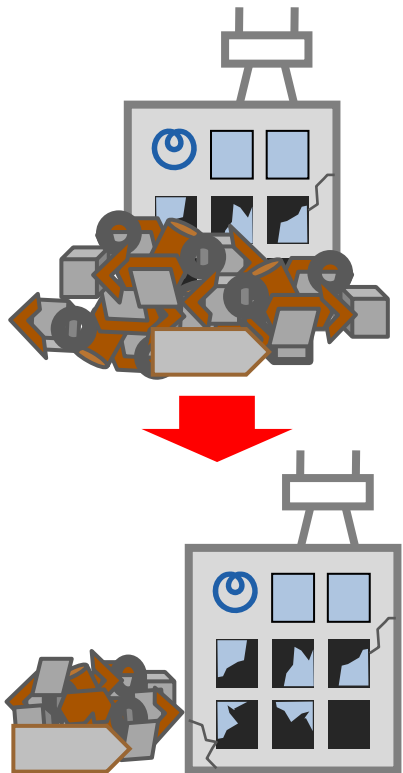


Removal of wreckage  
surrounding the building

Removal of wreckage and  
non-usable equipment  
inside the building

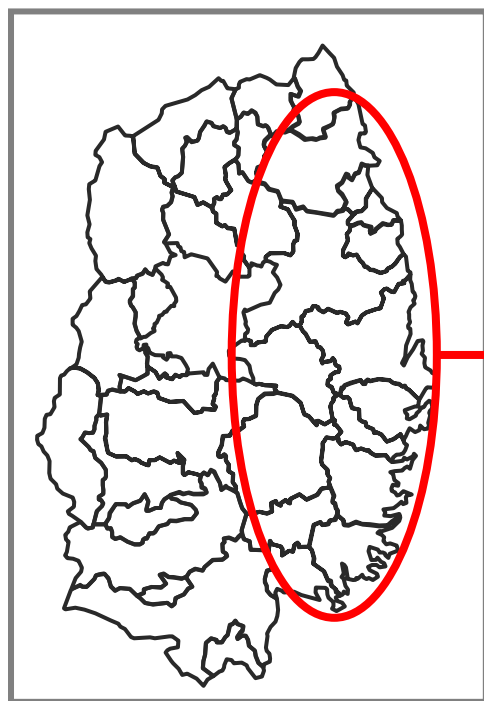
Restoration of building  
power

Installation of  
communication equipment

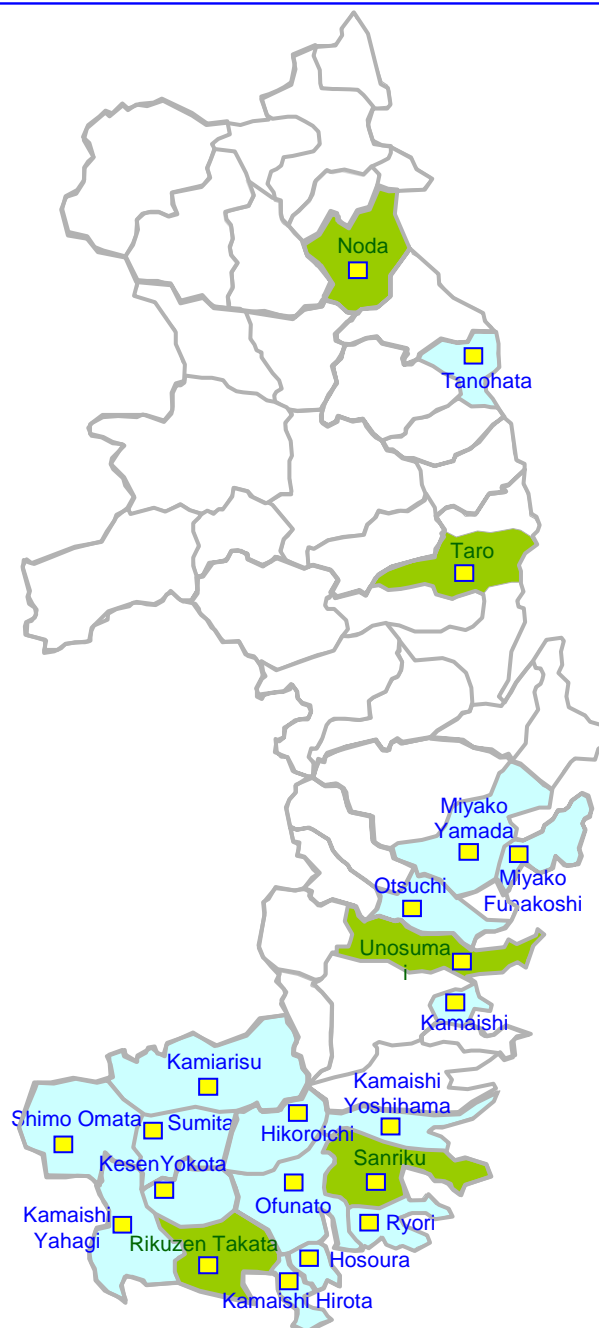


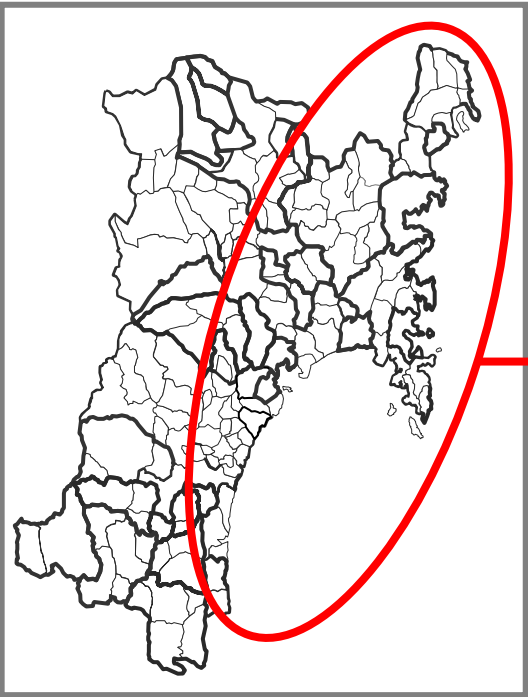
Restoration  
of services

# 【Reference】Exchange offices with discontinued services in Iwate Prefecture



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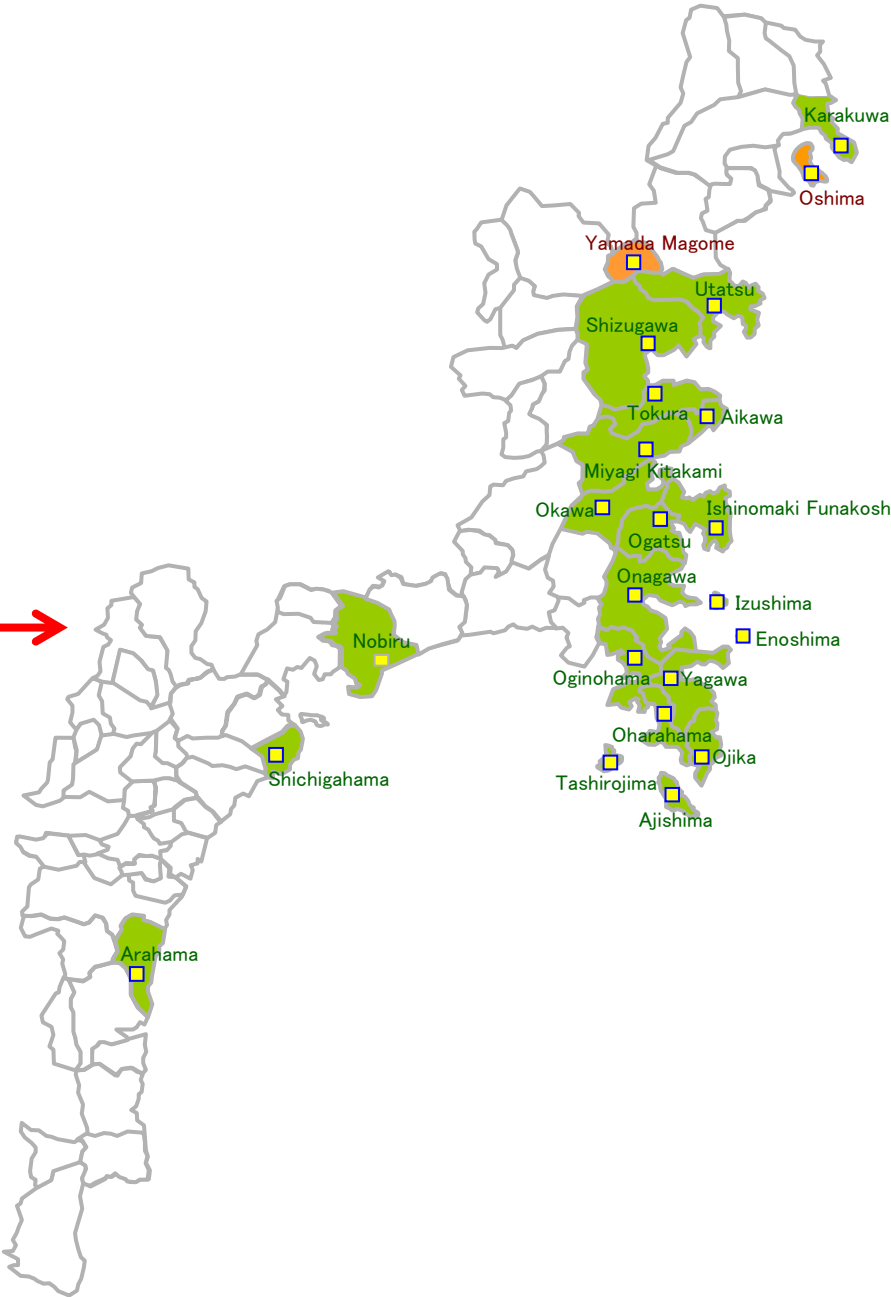
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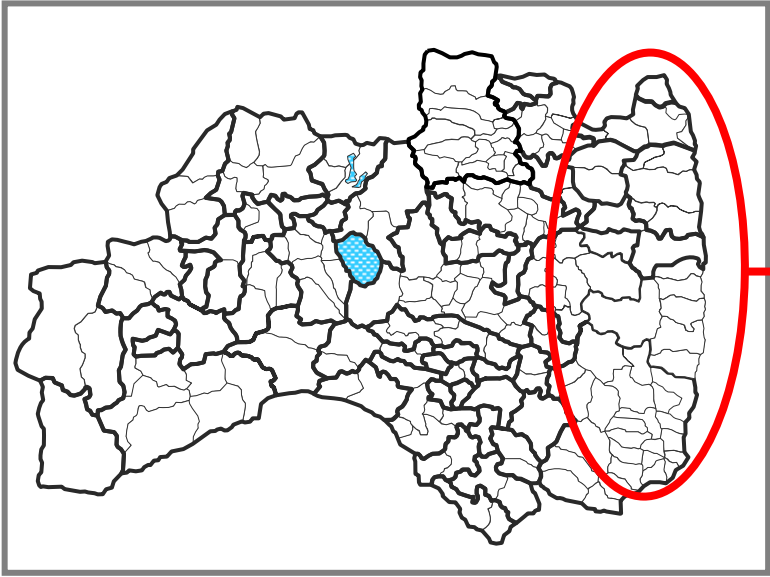
A

B

C

Exchange offices





<Legend>

