Impact of the tsunami by the Great East Japan Earthquake on seagrass beds and fish assemblages in Miyako Bay

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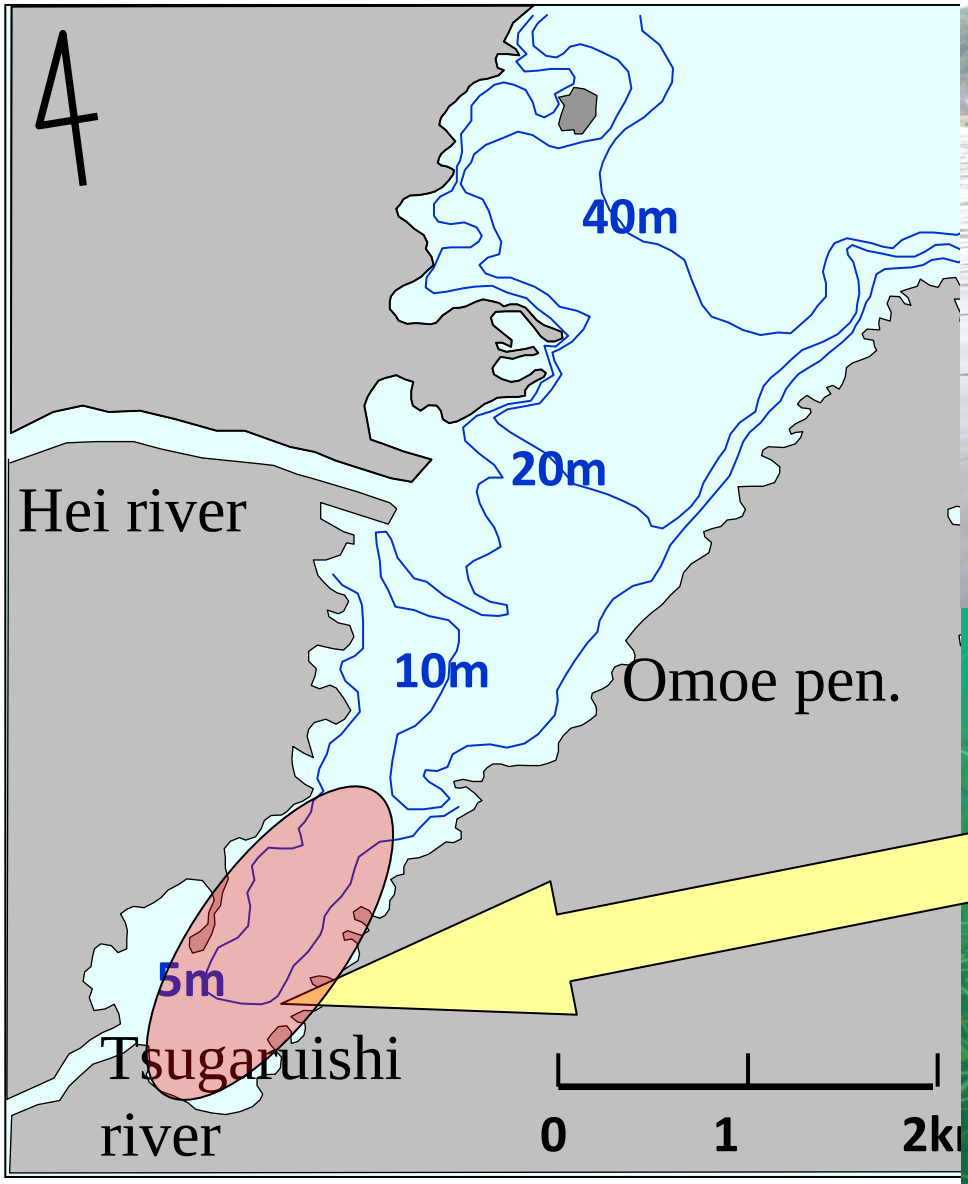
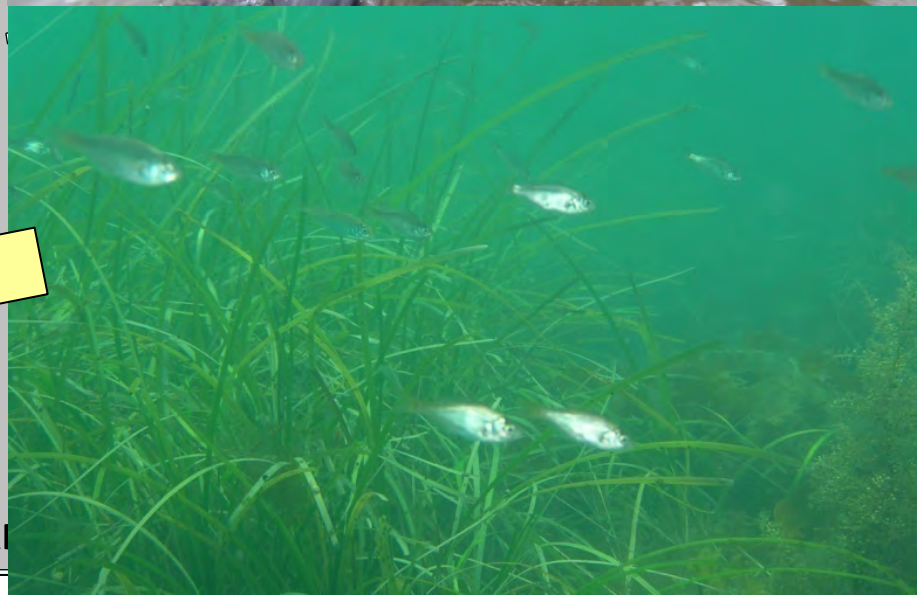
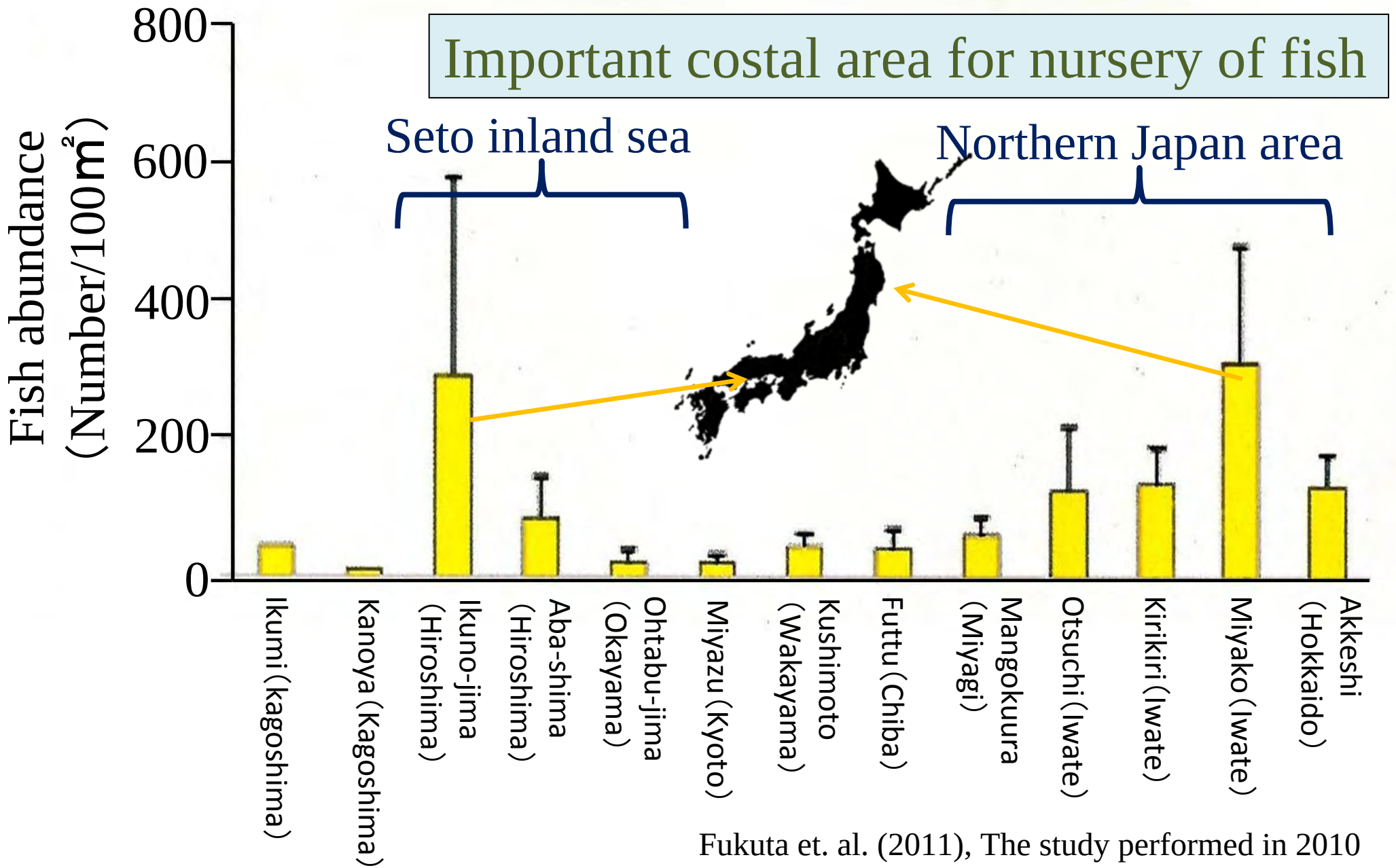
Location of Miyako Bay





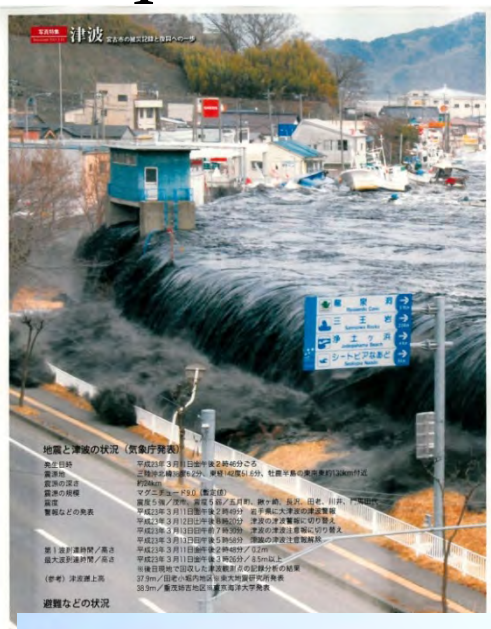
Fish abundance in seagrass beds in Japan



Fukuta et. al. (2011), The study performed in 2010

The Great East Japan Earthquake on 3.11 2011

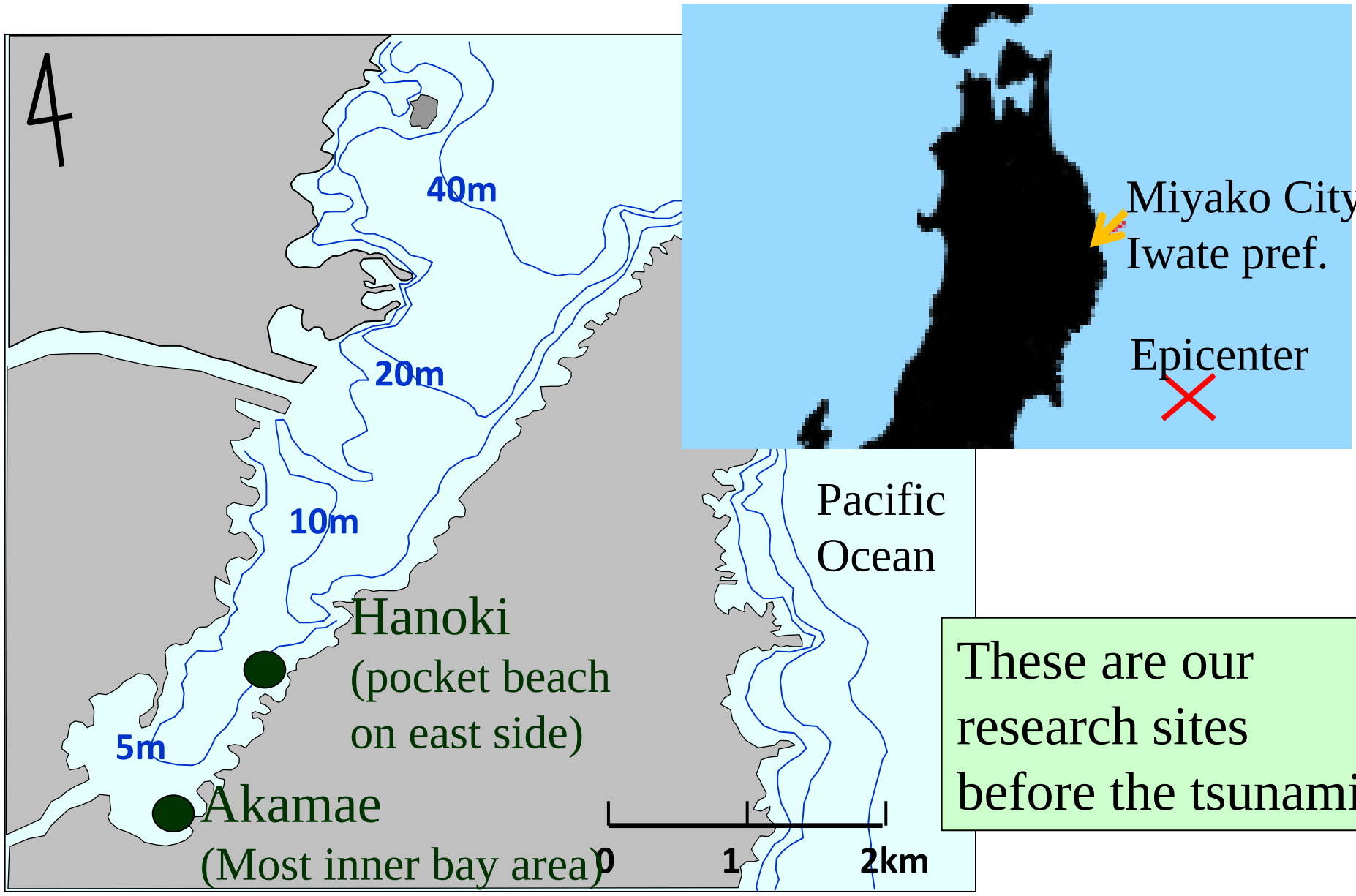
The tsunami struck
Northern Japan coastal area



Damage for…
- Seagrass bed area?
- Fish juvenile?

We started study of …
- Seagrass
- Fish abundance and assemblage

Study sites


4
40m
20m
10m
5m
Hanoki
(pocket beach
on east side)
Akamae
(Most inner bay area)
Pacific
Ocean
0
1
2km
Miyako City,
Iwate pref.
Epicenter
These are our
research sites
before the tsunami

Methods

- Study duration

July 2011-July 2012(Month by month)

- Seagrass (*Zostera marina*)

Density of shoots

Length of the leaf

- Fish abundance and assemblage

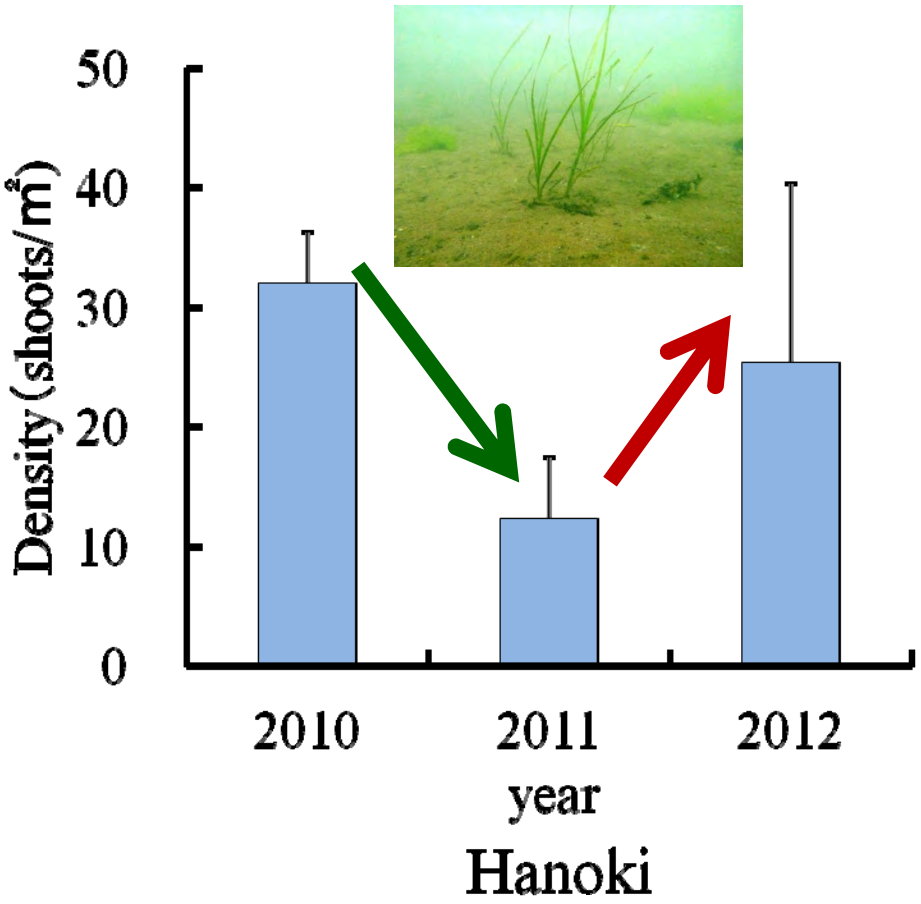
Fish were collected by a seine net

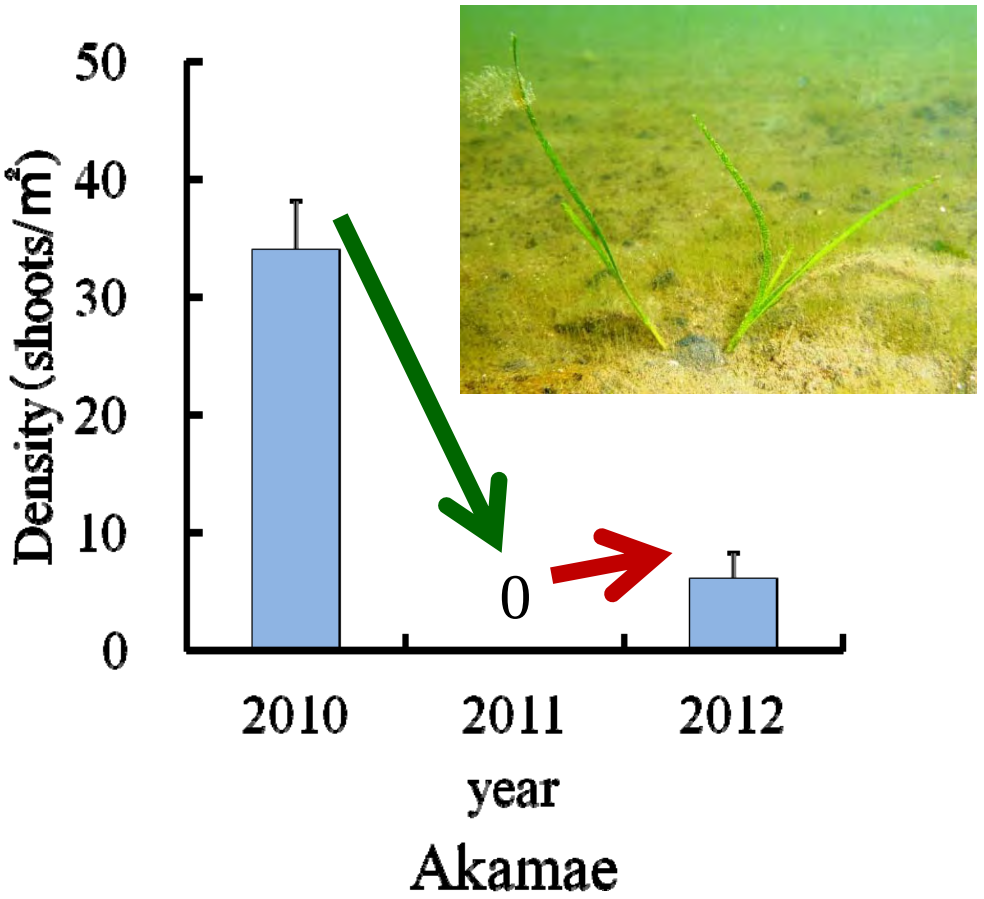
Identified species

Measured body length and weight

Comparison between 2010 and 2011-2012
(On June, before and after tsunami)

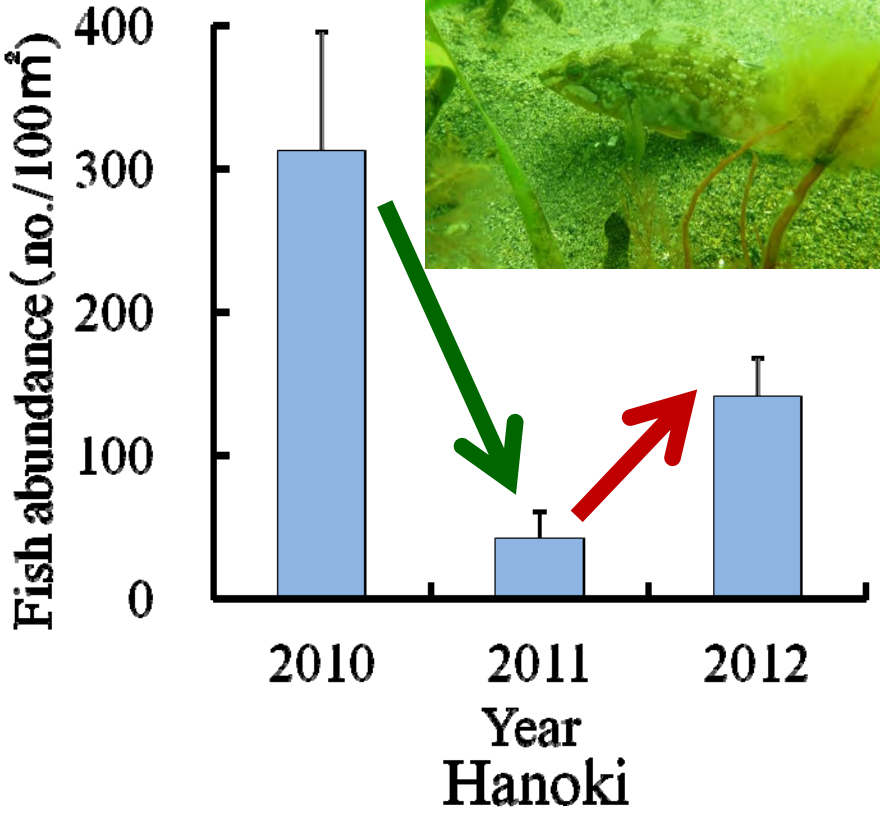
Annual changes of seagrass density (on June)

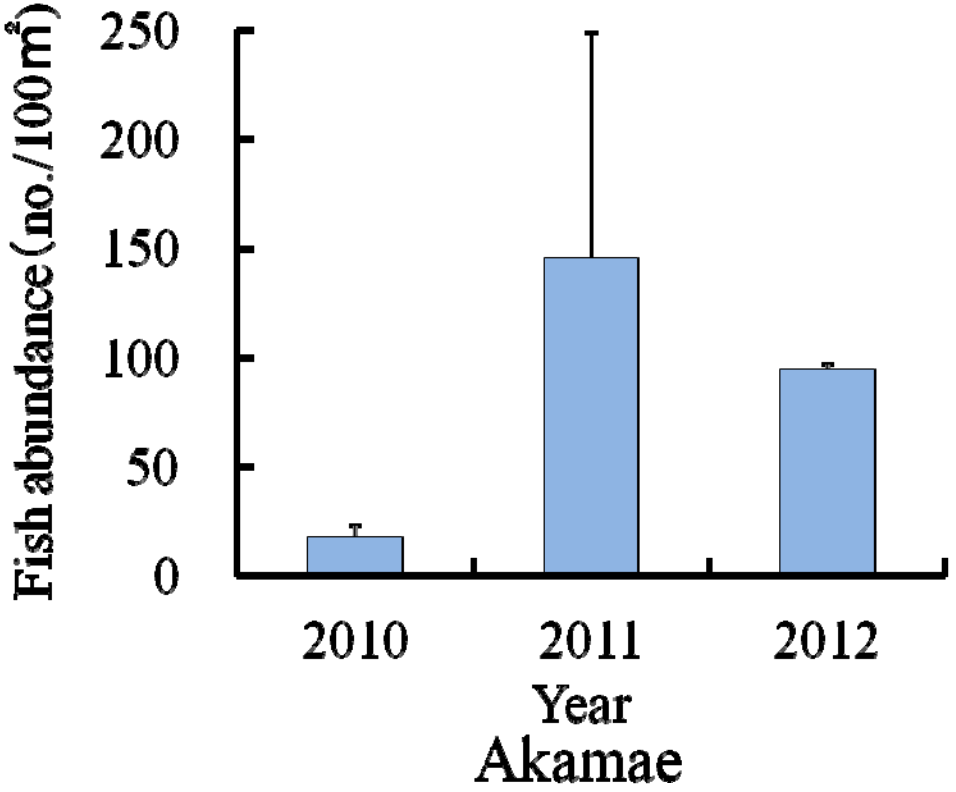




The density of the seagrass decreased after Tsunami.
Damage of Akamae area was bigger than Hanoki area.
Recovery process were observed.

Annual changes of fish abundance (on June)

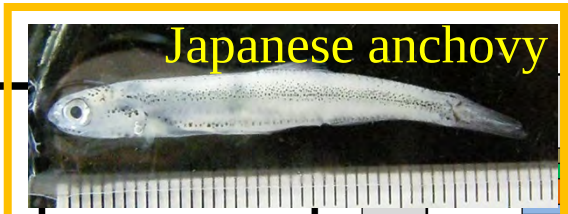


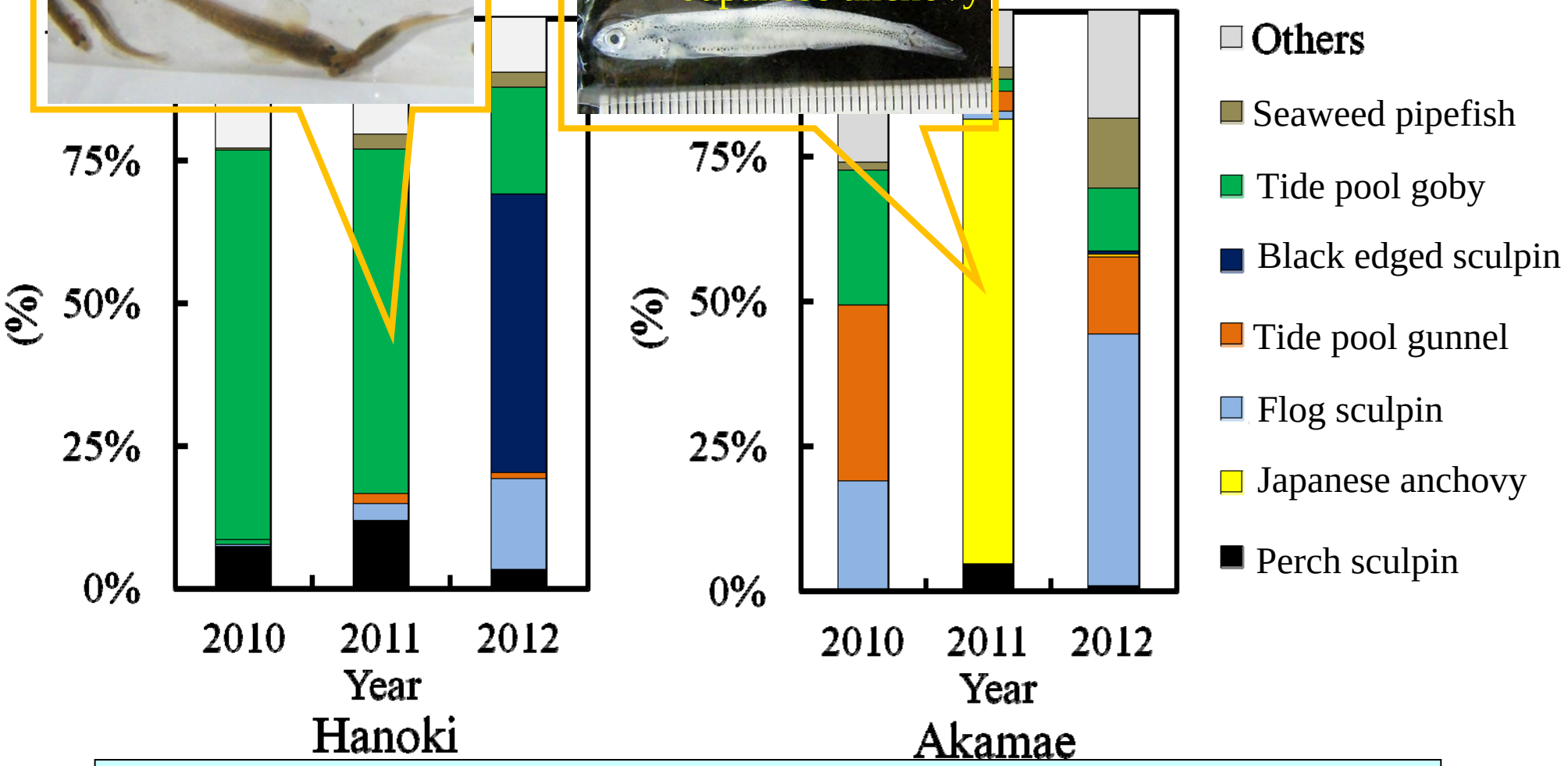


In Hanoki, the fish abundance decreased after Tsunami.
And the value in 2012 was larger than 2011.

In Akamae, the fish abundance increased after Tsunami…

Annual changes of Fish assemblage (on June)



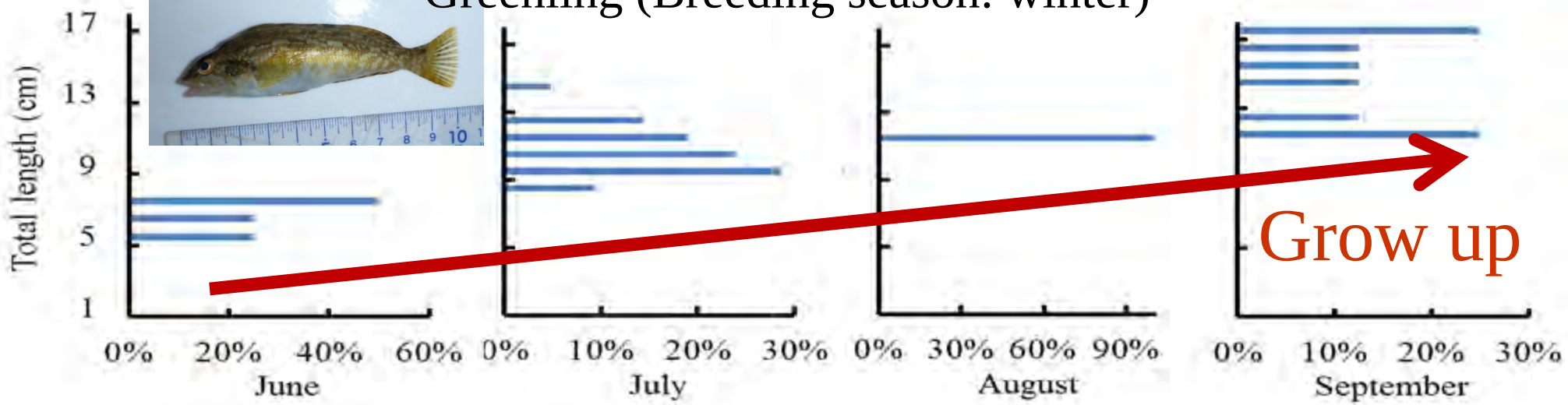


In Hanoki, the assemblage in 2011 was as same as 2010

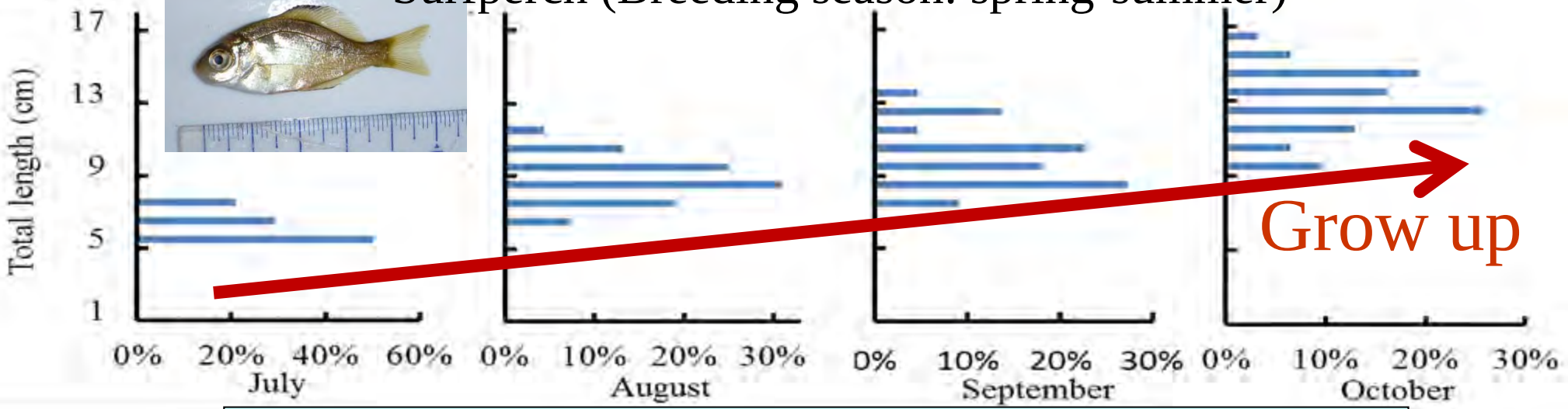
In Akamae, fish assemblage was drastically changed.

Monthly growth of the fish (2011)

Greenling (Breeding season: winter)



Surfperch (Breeding season: spring-summer)



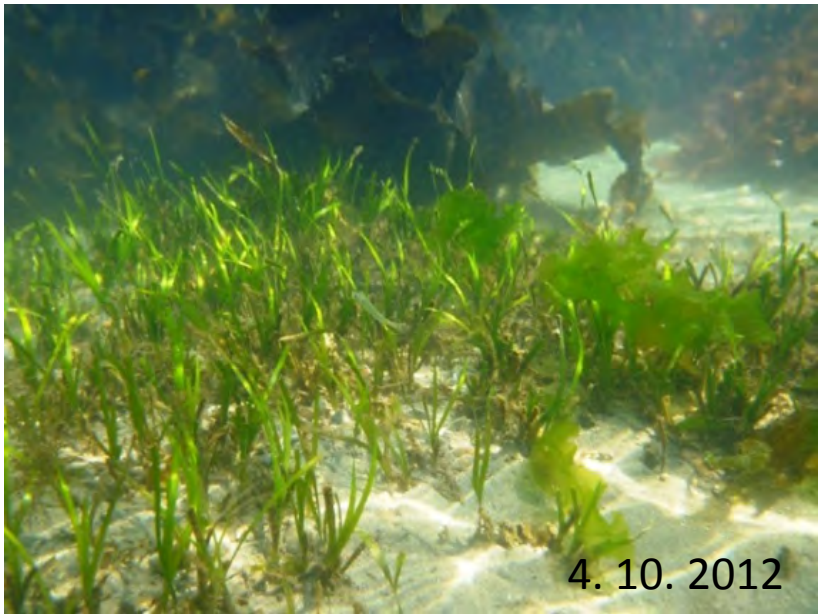
In both fish, size became large month by month

Conclusion

- Seagrass bed in the bay were damaged by the tsunami.
  And, the trend shows the seagrass is increasing.

- The impact of the tsunami on the seagrass beds were different between inner area and pocket beach area.
  In addition, fish assemblage were different, too.
  (Because, Japanese anchovy came to inner bay area)

- Fish were growing in the bay after the tsunami, and the nursery grounds for fish are remaining
  (possibility to restart the stock enhancement)



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