

The First International Workshop on Marine Litter
in the Northwest Pacific Region

Use of disposable lighter as an indicator item to monitor marine debris



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1. Introduction

Marine debris

Highly-complicated factor

Continual occurrence

Subject

1. Clarification of outflow factor
2. Clarification of outflow source
3. Development of method to monitor
4. Monitoring of discharge area, flow and extent of the effect



2. Disposable lighter

Characters

1. Popular item
2. Robust hollow construction
3. Small and loud color
4. Punched marks and printed characters

1. Large number
2. Drifting of a long time
3. Easy discovery, collection and transportation.
4. Distinction of outflow area, country and location.



Disposable lighters

Japan Korea Taiwan China Hong Kong



3. Collecting method

Collecting period :

Aug. 2003 ~ Jun. 2005

Request method :

Newsletter • Mailing list

(Japan driftological society,

JEAN • Cleanup Japan Office)

Collector : Total 32 persons

Beachcomber,

Beach cleanup captain

Collected sites :

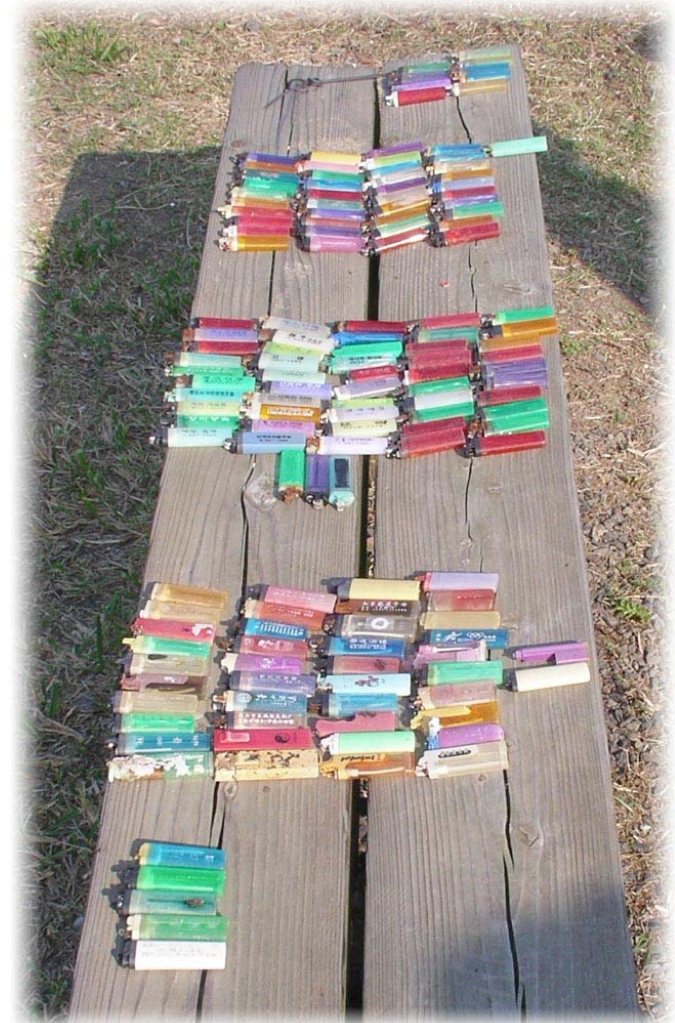
Japan 203 beaches

Korea 3 beaches

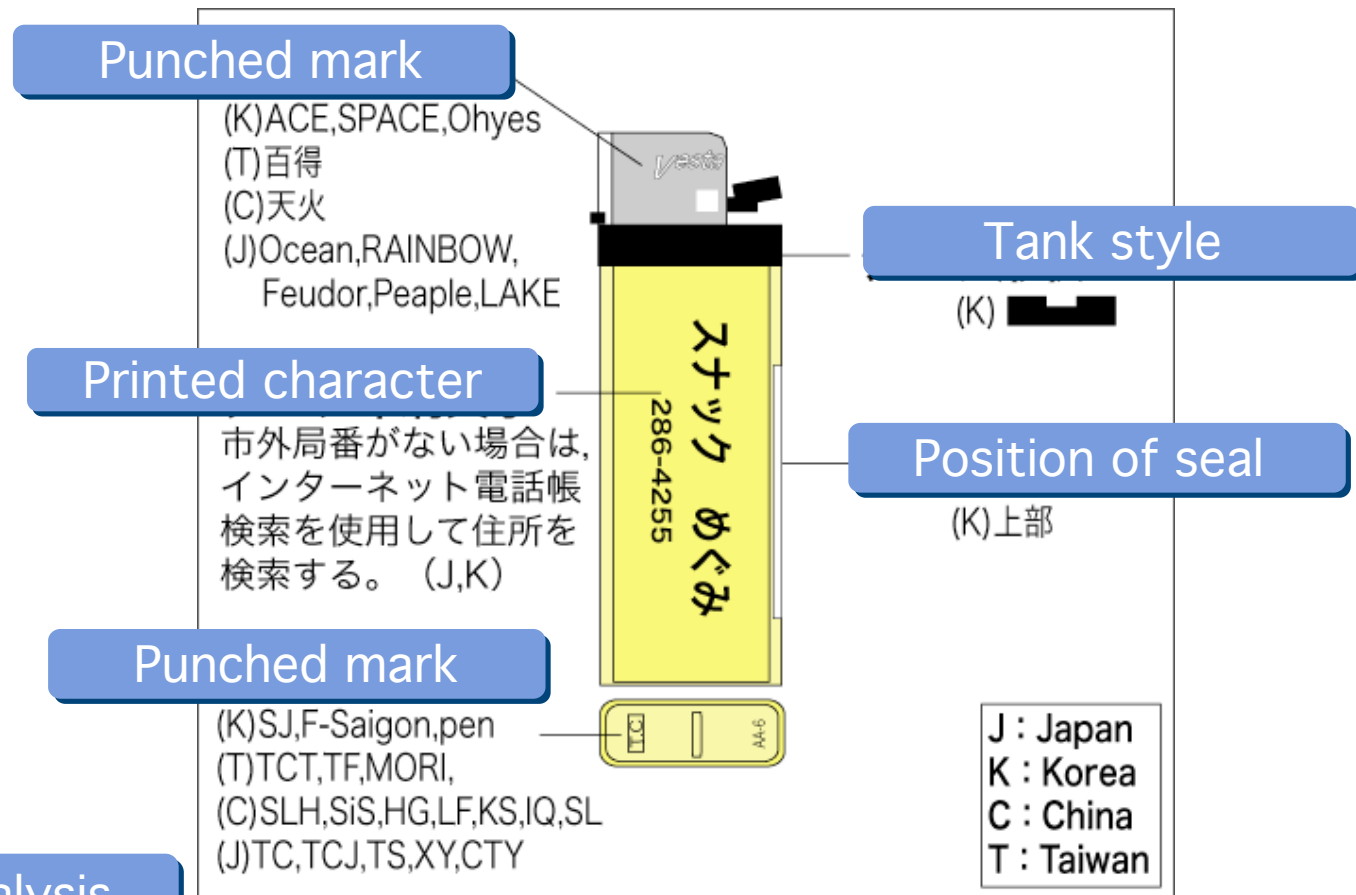
Total collected number : 11,250



Tsushima (Nagasaki)



4. Distinction

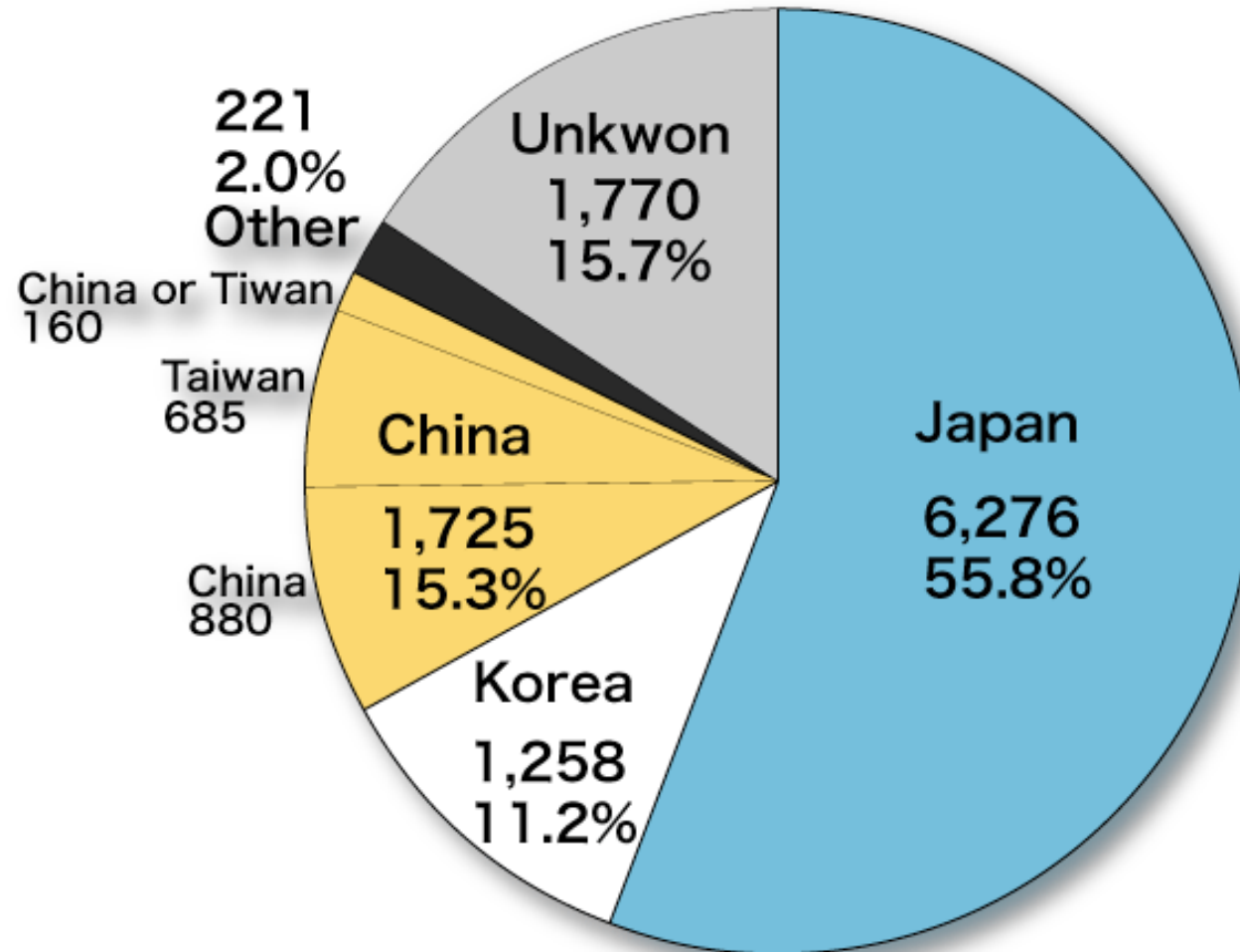


Analysis

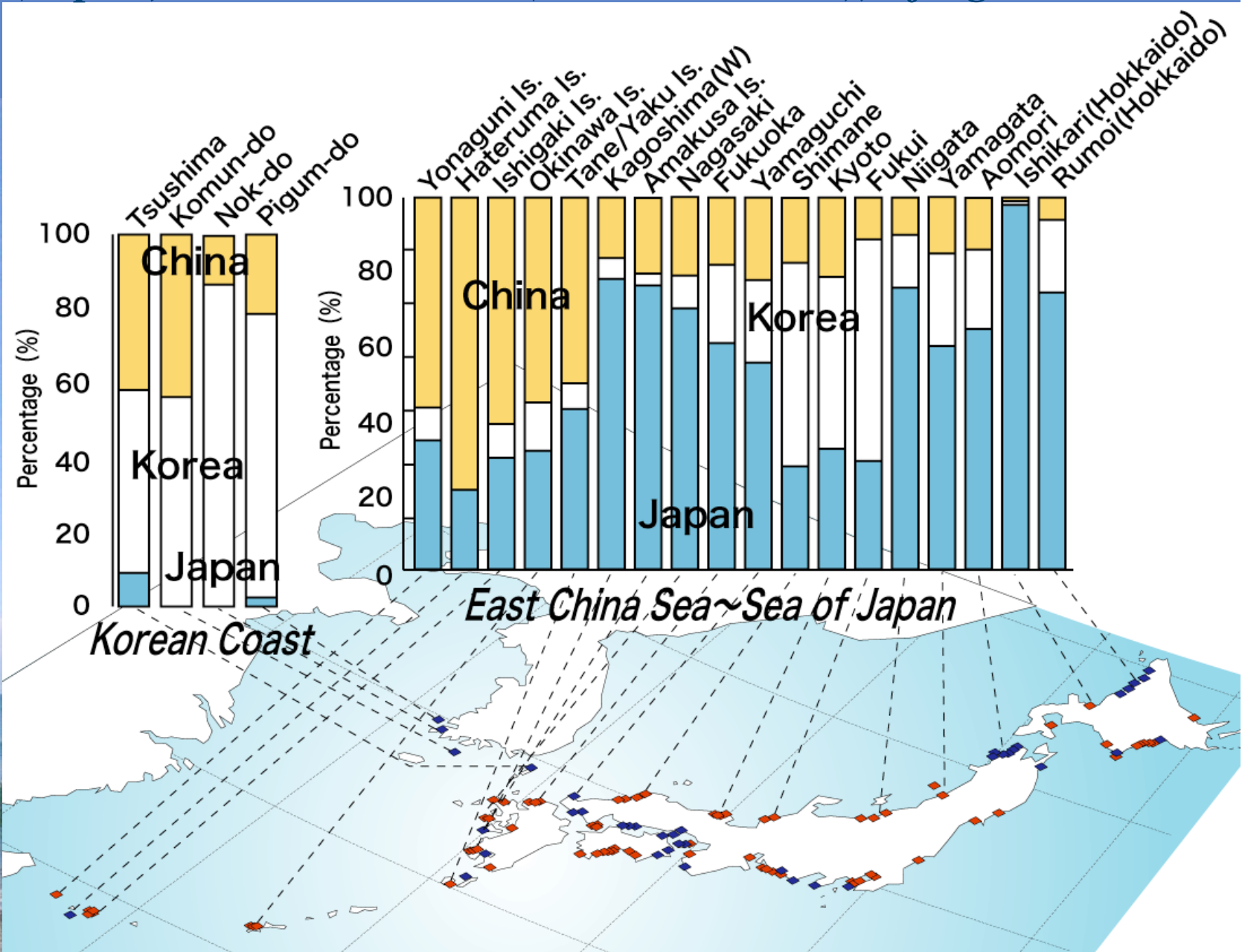
- (1) Percentage of production and consumption countries.
- (2) Relation between collected sites and outflow locations.
- (3) Temporal change of a collected number.

5. Result

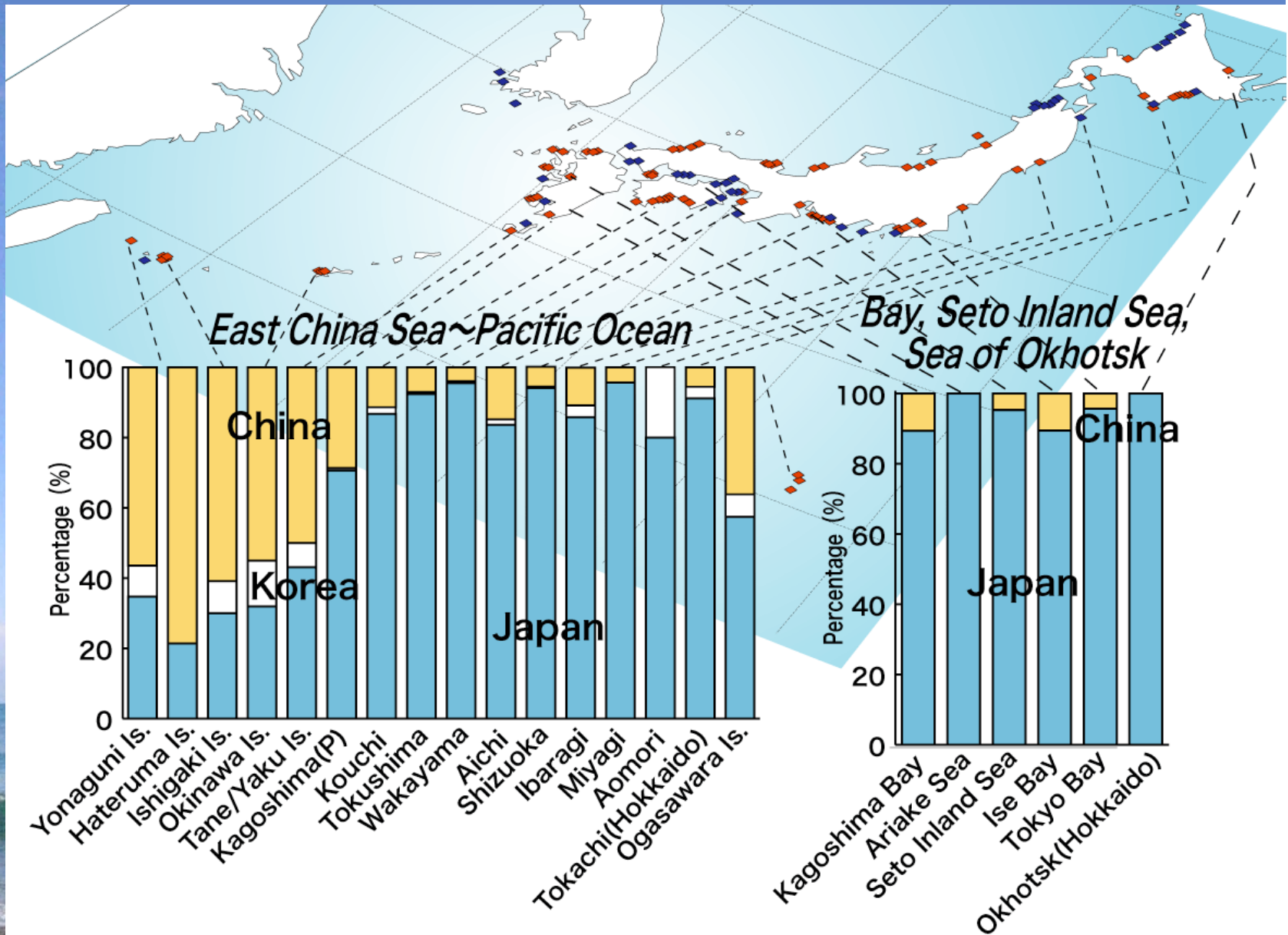
Percentage of production and consumption countries of collected all lighters.



5-1. Percentage of production and consumption countries (Japan, Korea and China (include Taiwan)) of lighters.

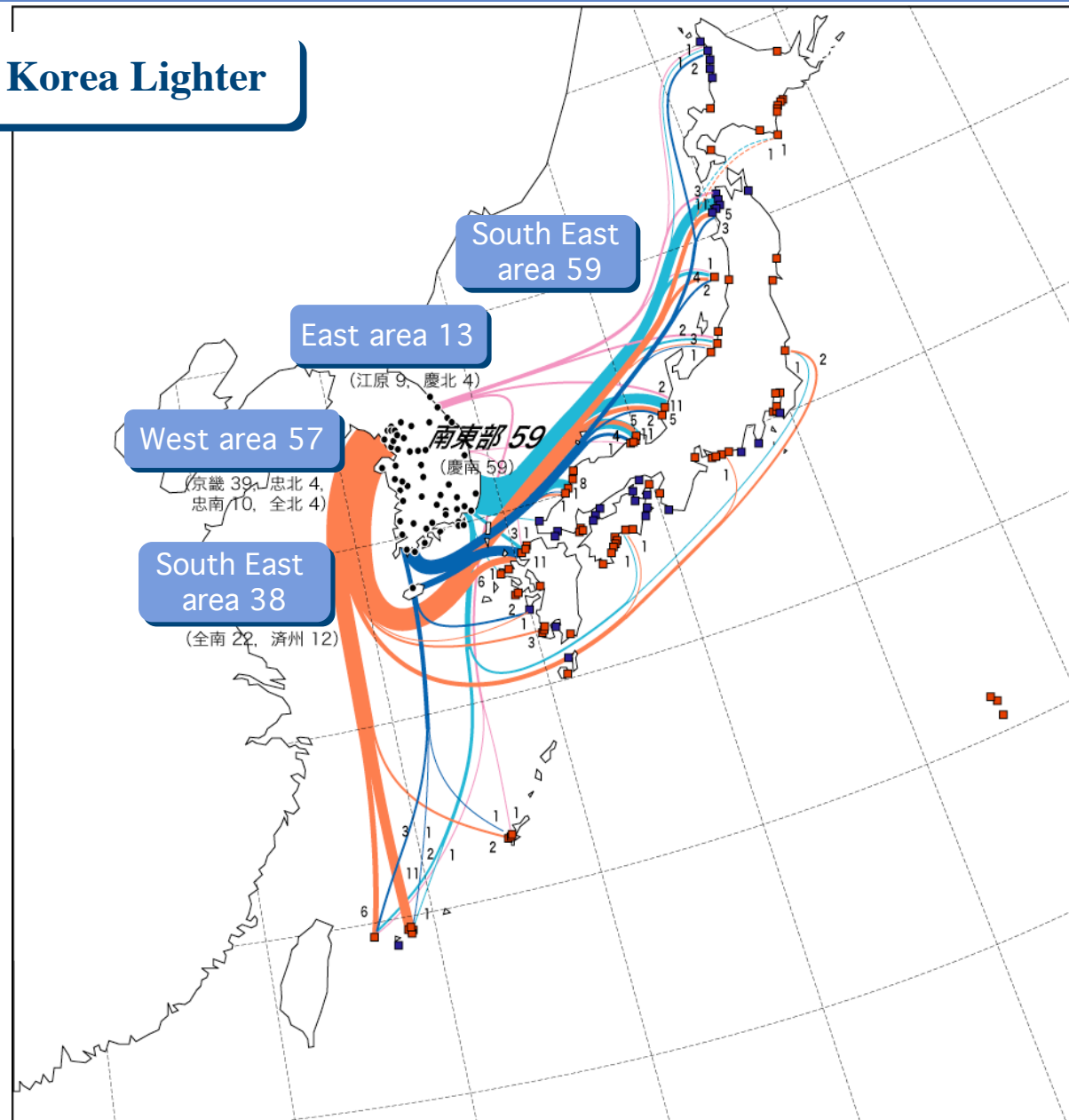


5-1. Percentage of production and consumption countries (Japan, Korea and China (include Taiwan)) of lighters.



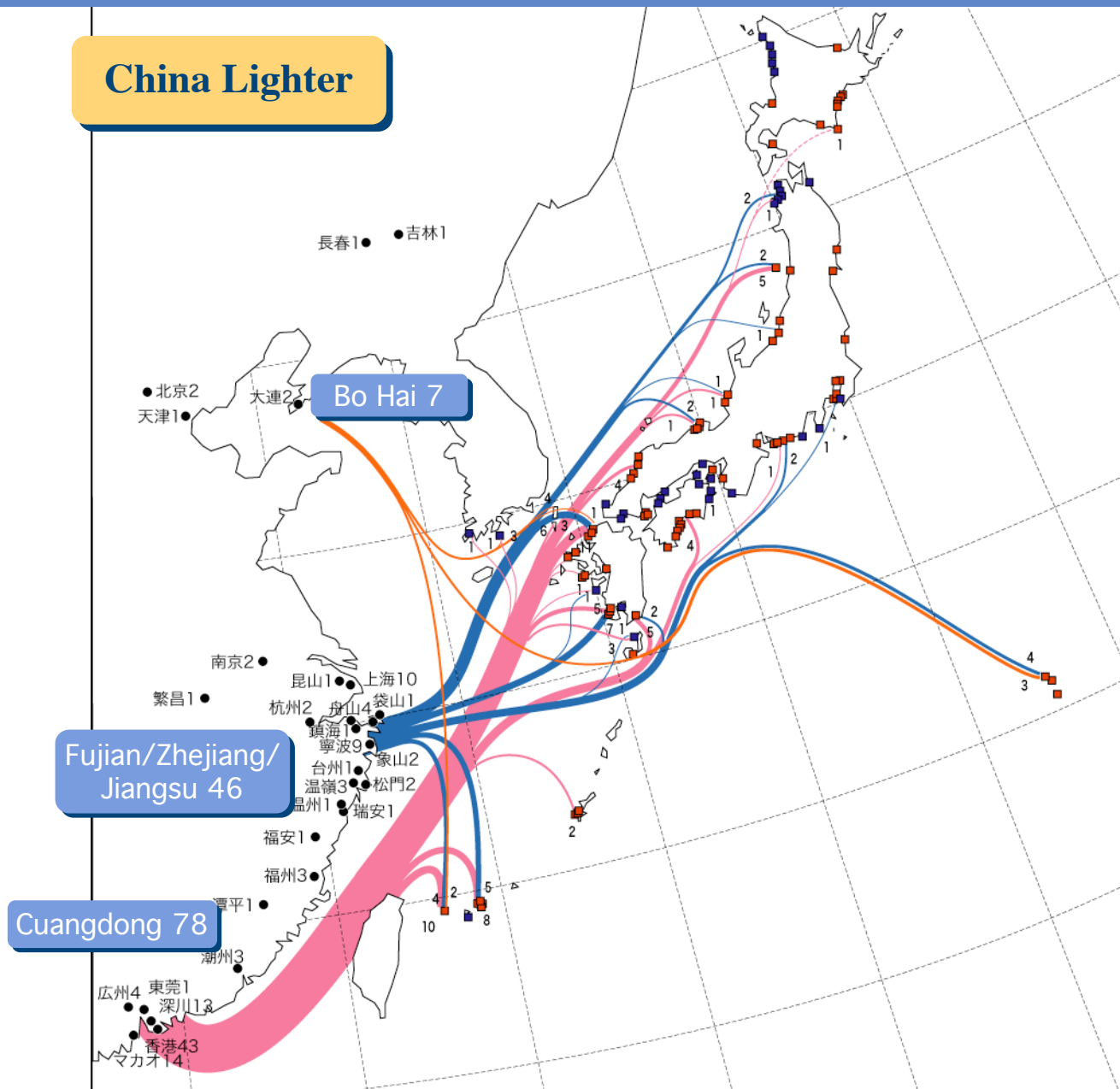
5-2. Relation between collected sites and outflow locations on Japan coast.

Korea Lighter



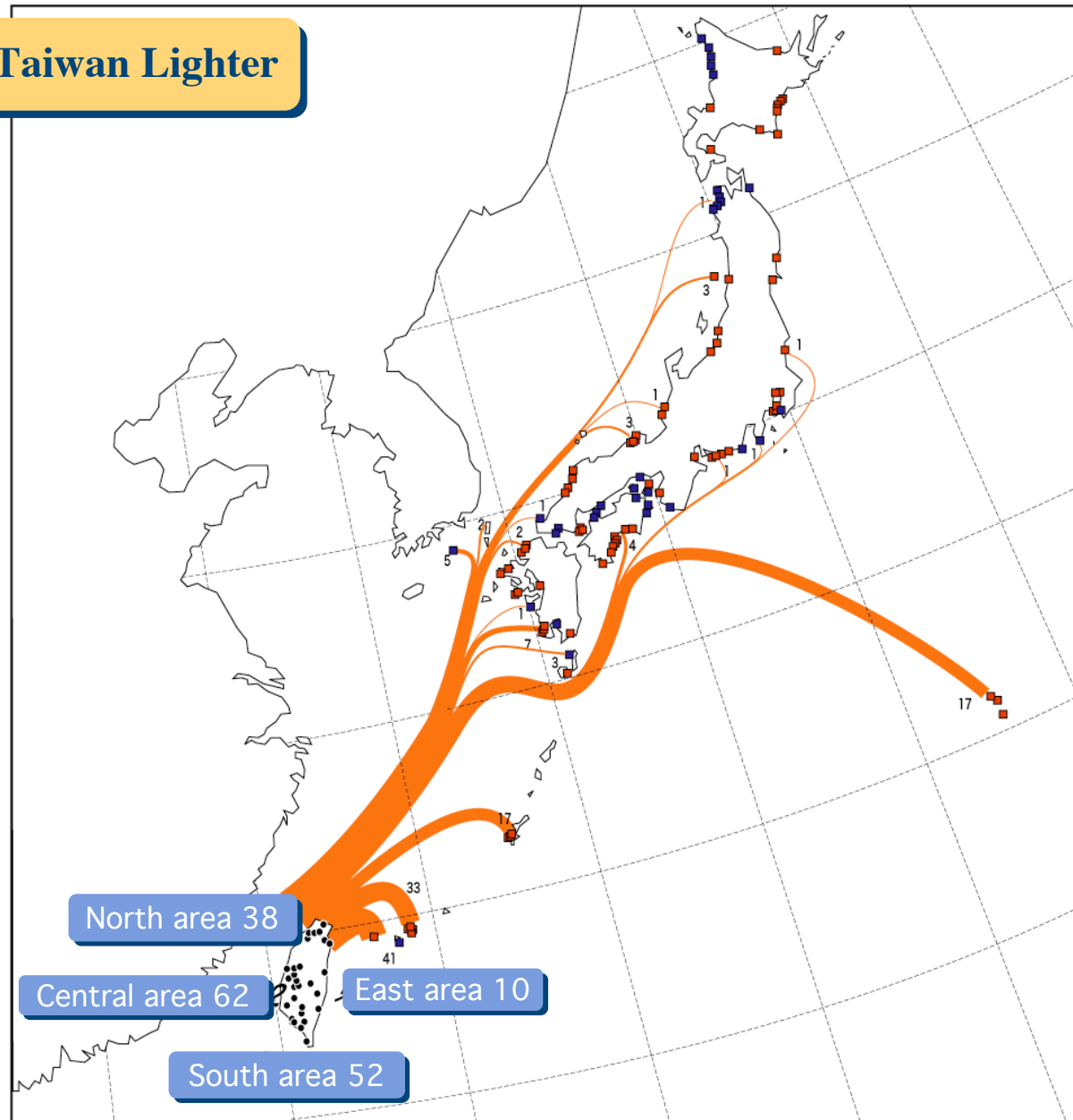
5-2. Relation between collected sites and outflow locations on Japan coast.

China Lighter



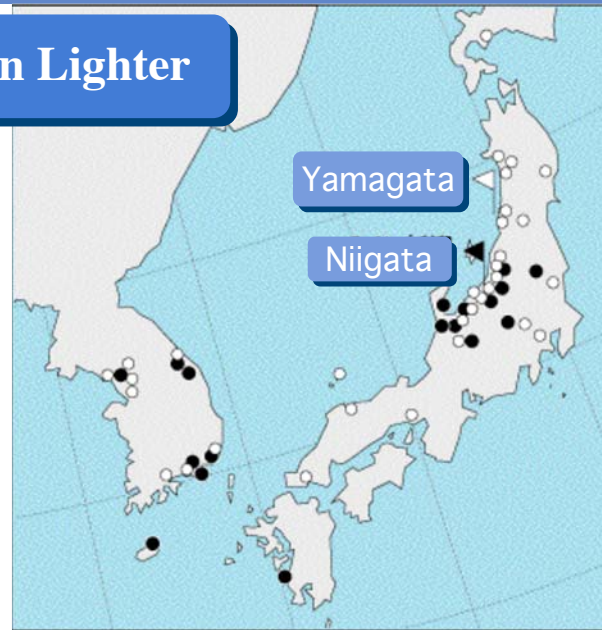
5-2. Relation between collected sites and outflow locations on Japan coast.

Taiwan Lighter



5-2. Relation between collected sites and outflow locations on Japan coast.

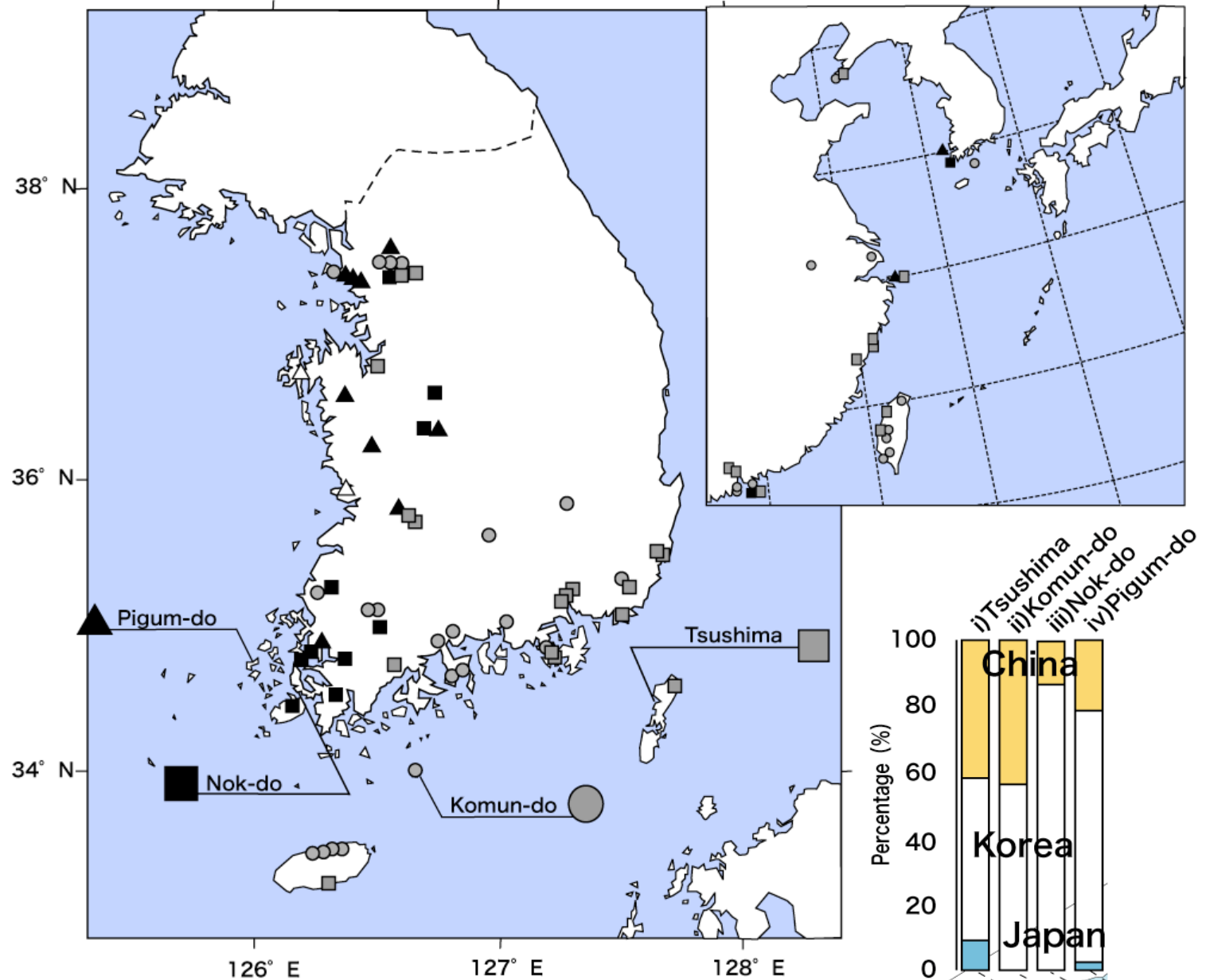
Japan Lighter



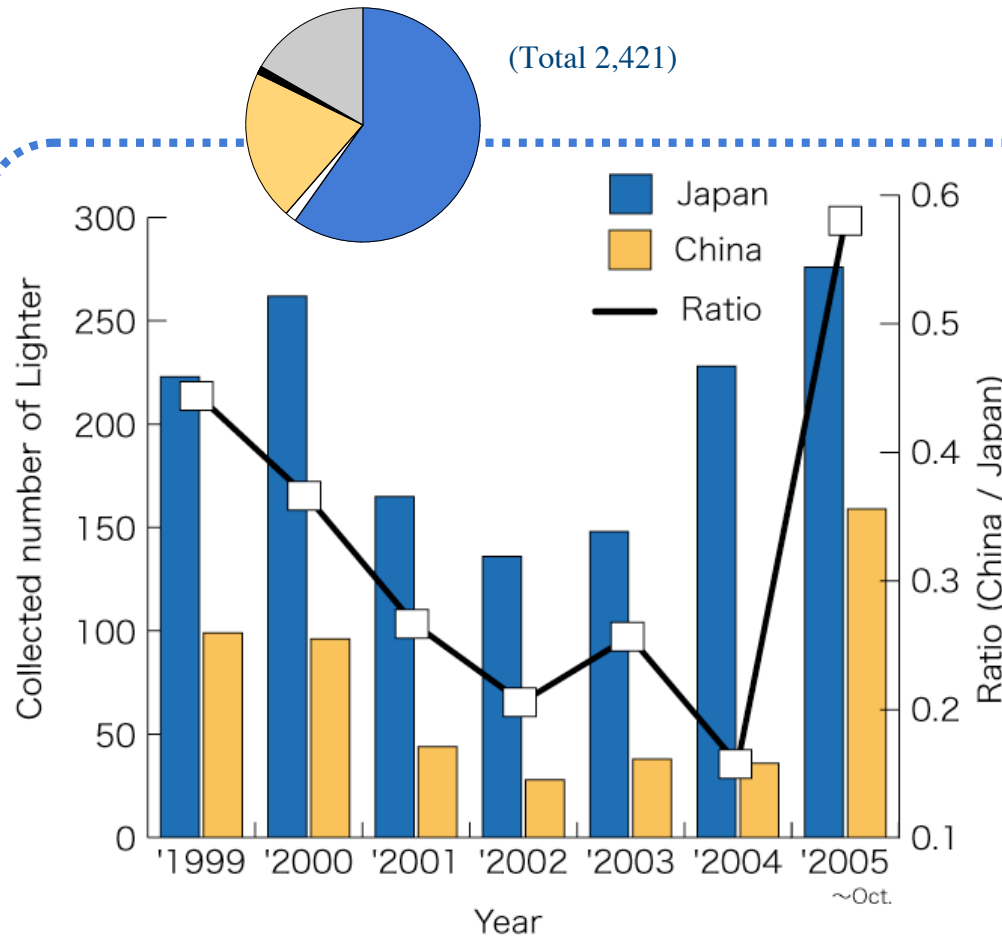
Outflow location → Collected site



5-2. Relation between collected sites and outflow locations on Korean peninsula.

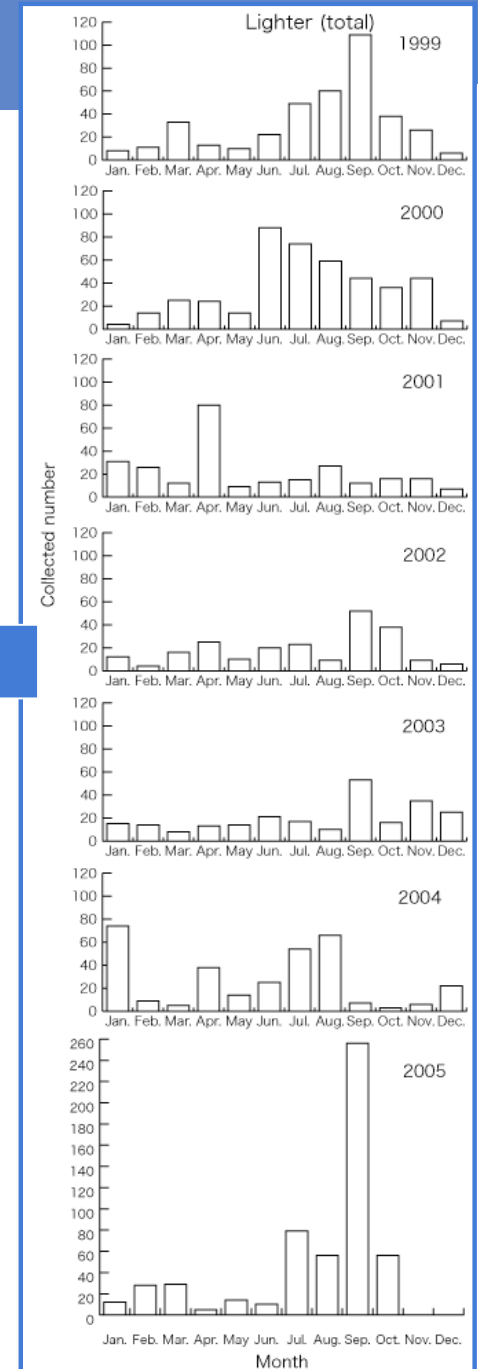


5-3. Temporal change of a number of collected lighter from 1999 to 2005.



Annual change of a collected number of “Japan lighter” and “China lighter”, and the ratio.

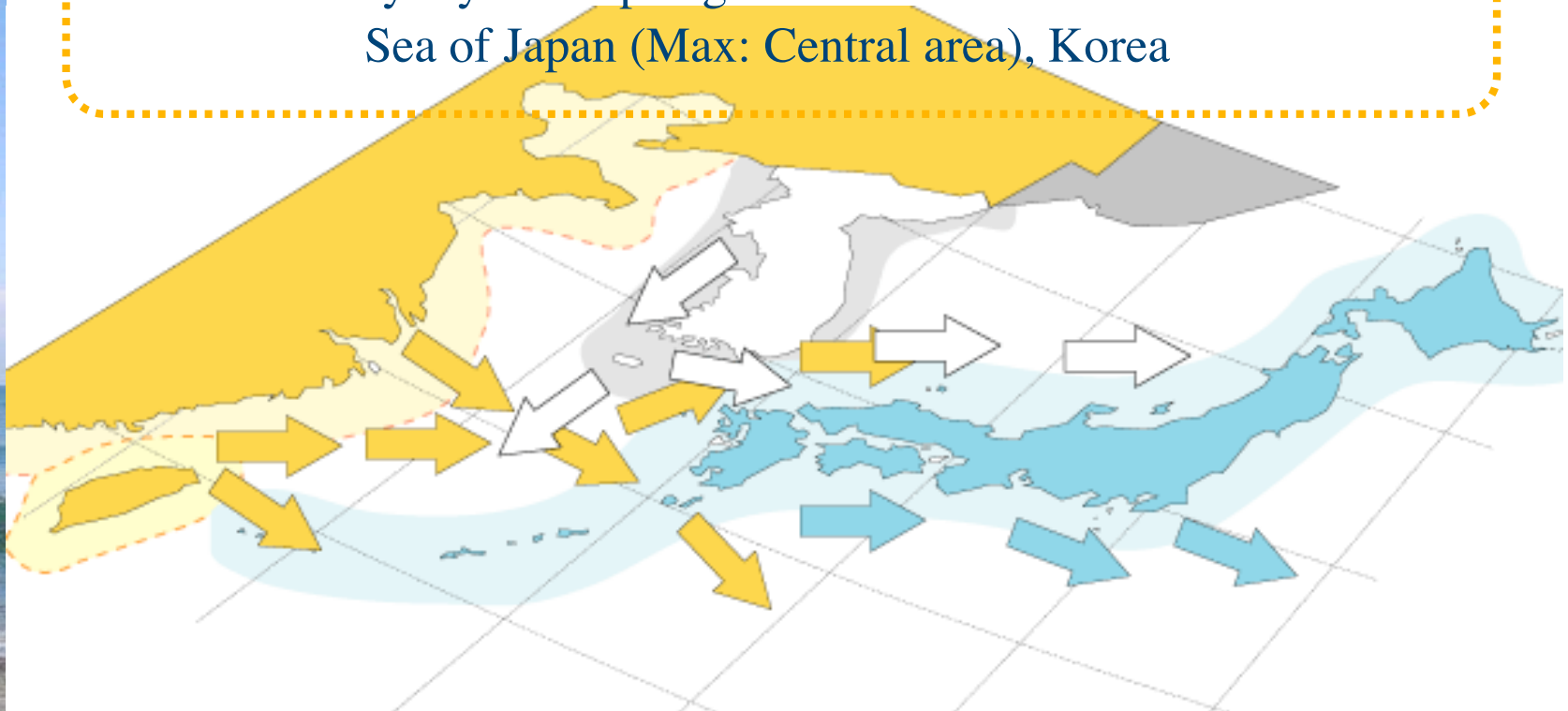
Monthly change of a total number of collected lighter from Jan. 1999 to Oct. 2005 on Fukiagehama, Kagoshima prefecture (sampling distance:1.6km).



6. Summary

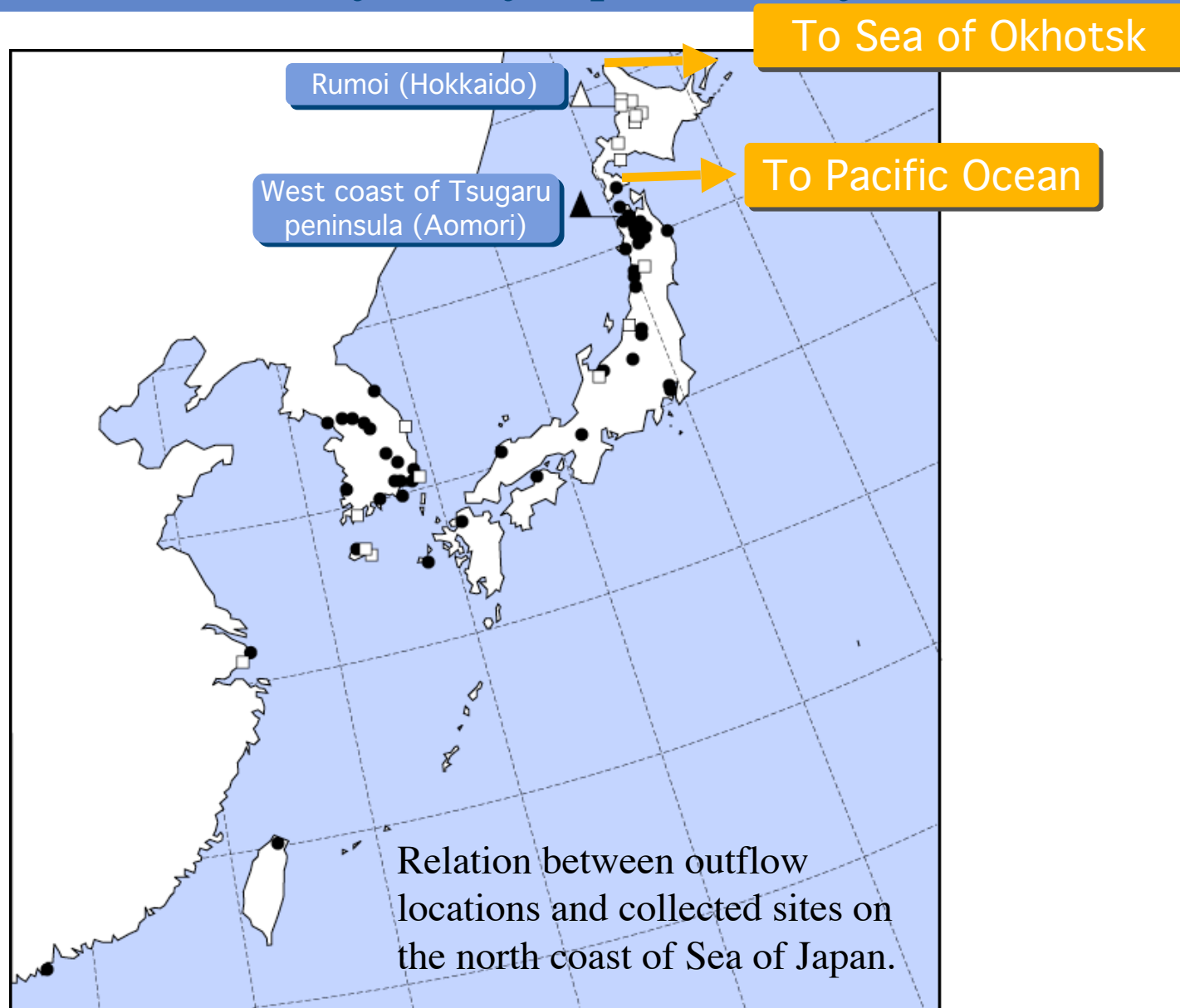
Source and area of effect

1. **China** : Ryukyu archipelago ~ Sea of Japan, Korean peninsula, Pacific Ocean, China (?)
2. **Taiwan** : Ryukyu archipelago (Max) ~ Sea of Japan, Pacific Ocean, Korean peninsula, Taiwan (?)
3. **Japan** : Whole coast of Japan, Pacific Ocean
4. **Korea** : Ryukyu archipelago ~ Sea of Japan (Max: Central area), Korea



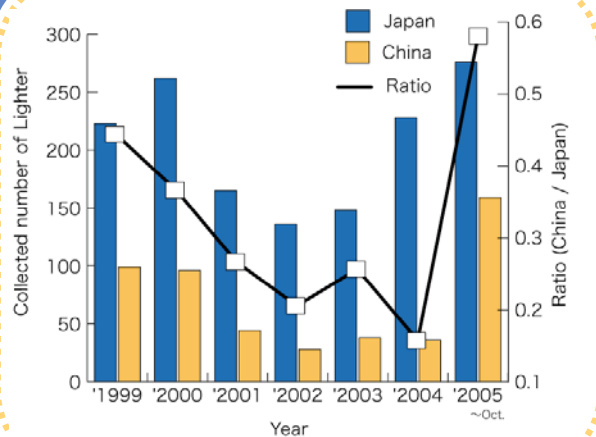
7. Future issues

7-1. Elucidation of Sea of Japan route of marine debris.

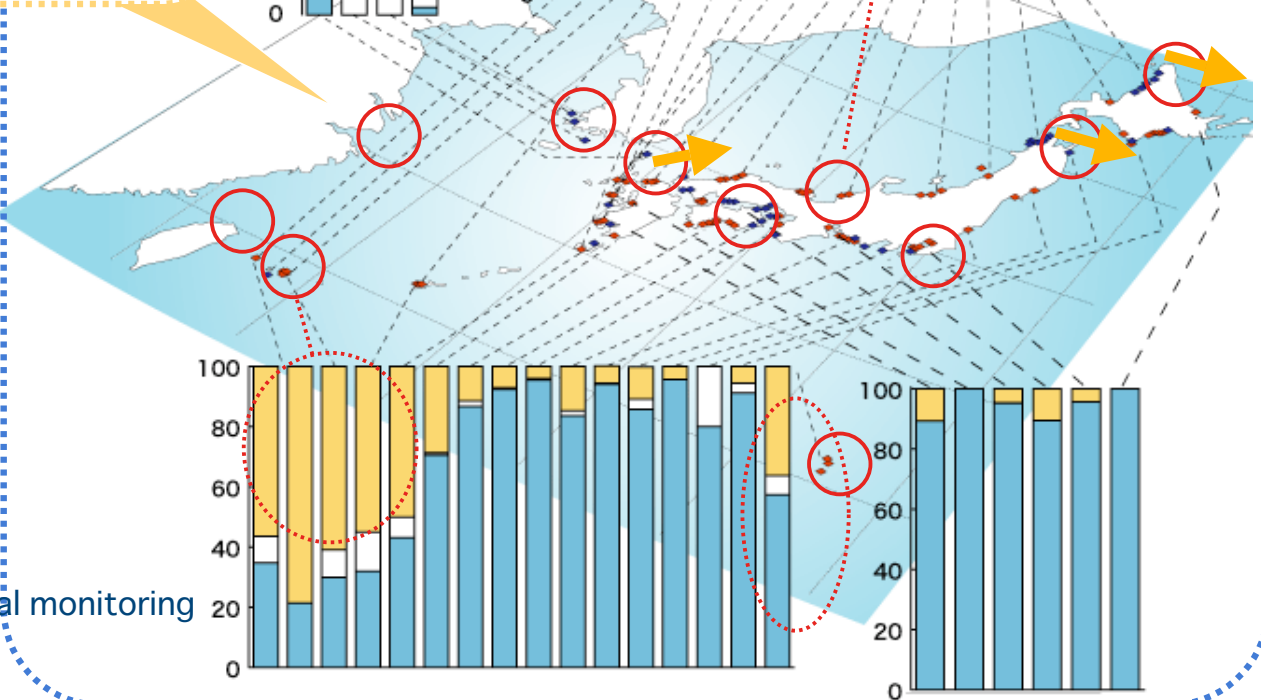
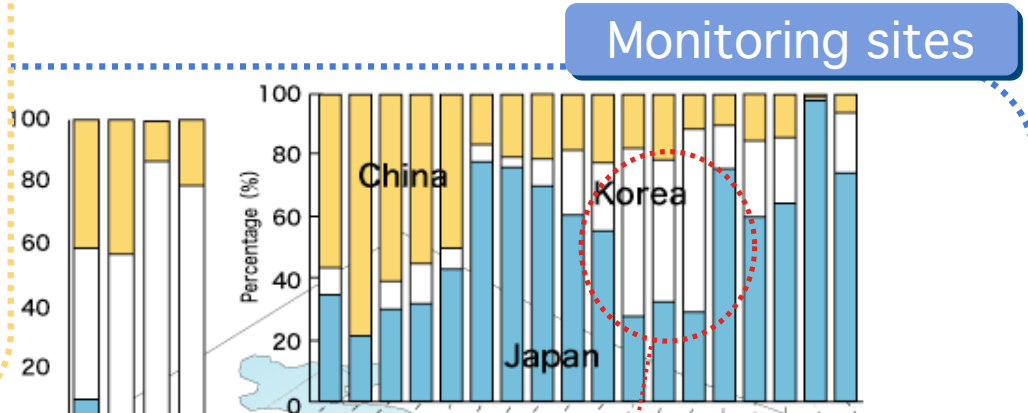


7. Future issues

7-2. Continual monitoring



Temporal Change



○ Sites of continual monitoring

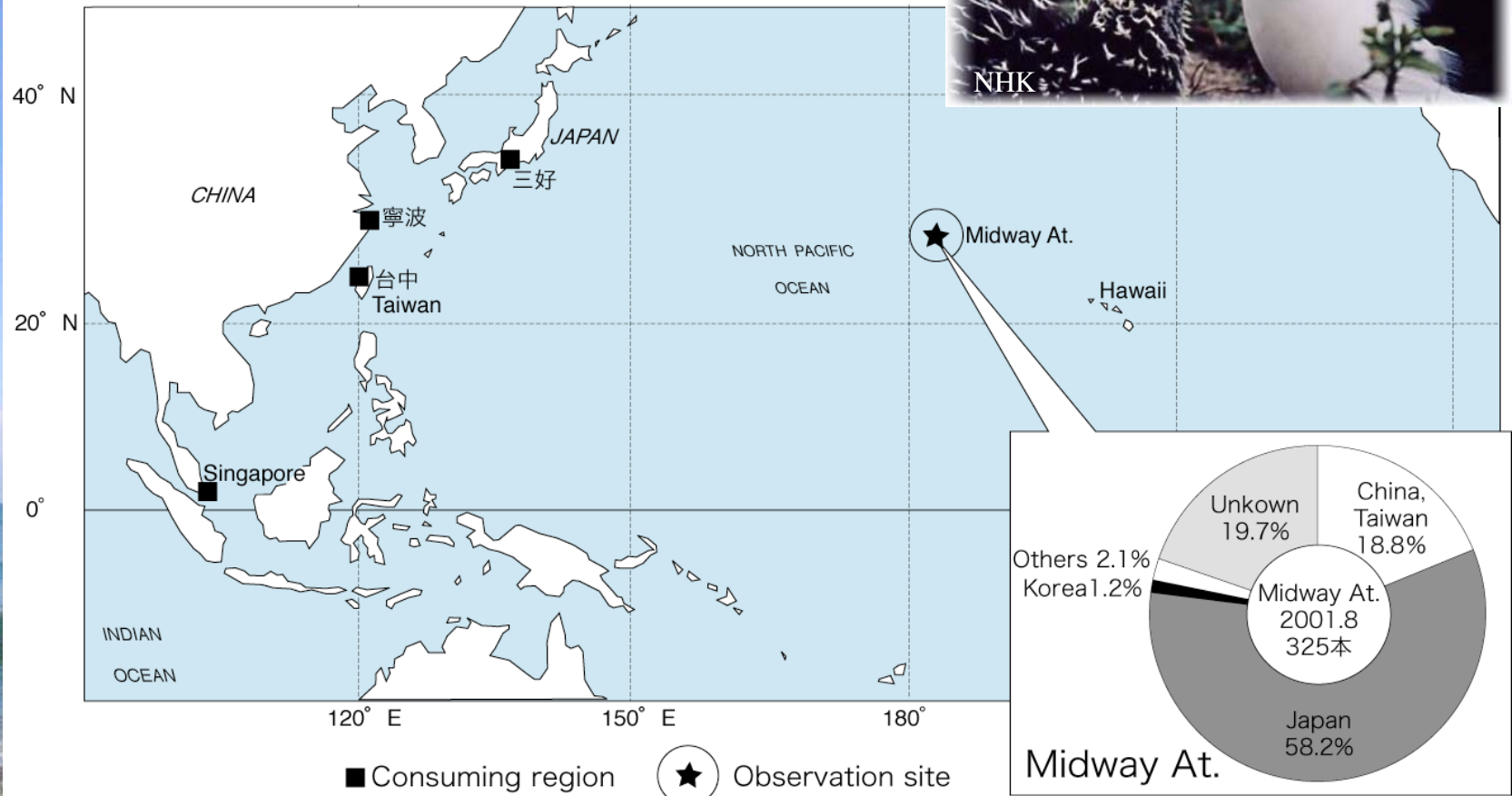


7. Future issues

7-3. Responsibility of East Asia region to NWP

Outflow locations and percentage of production and consumption countries of lighters.

This lighter was picked up from a corpse of young bird of Laysan Albatross on the Midway Atoll, USA.



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East Asia is a pollution source of the northwest Pacific.

East Asia countries must step up joint efforts to solve
the problem of marine litter in the Northwest Pacific.

The end



Tsugaru peninsula / Aomori

Thank you very much.