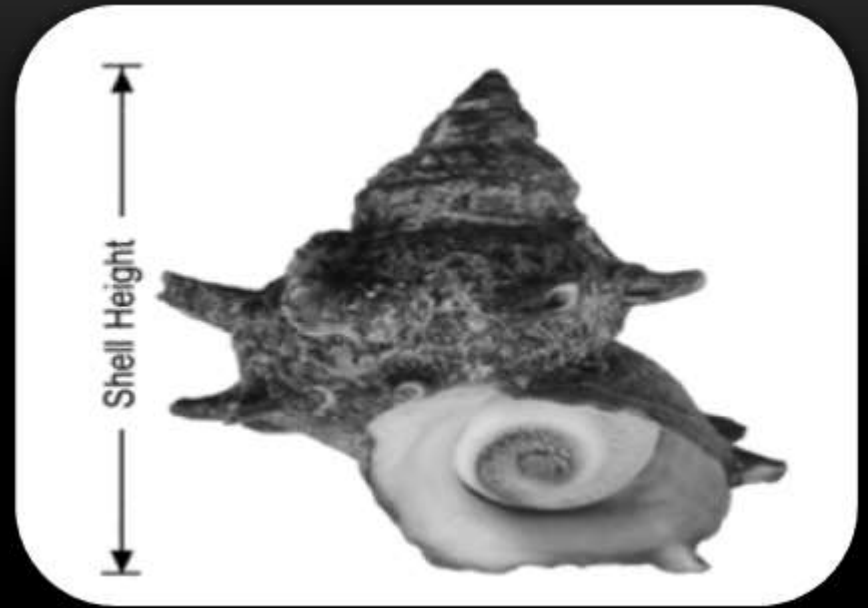


RELATIONSHIP OF SITE-SPECIFIC MAXIMUM
SUSTAINABLE YIELD OF TURBAN SHELL *Batillus
cornutus* WITH ALGAL STANDING STOCK BIOMASS
ALONG THE COAST OF JEJU ISLAND, KOREA

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Turban shell (*Batillus cornutus*)

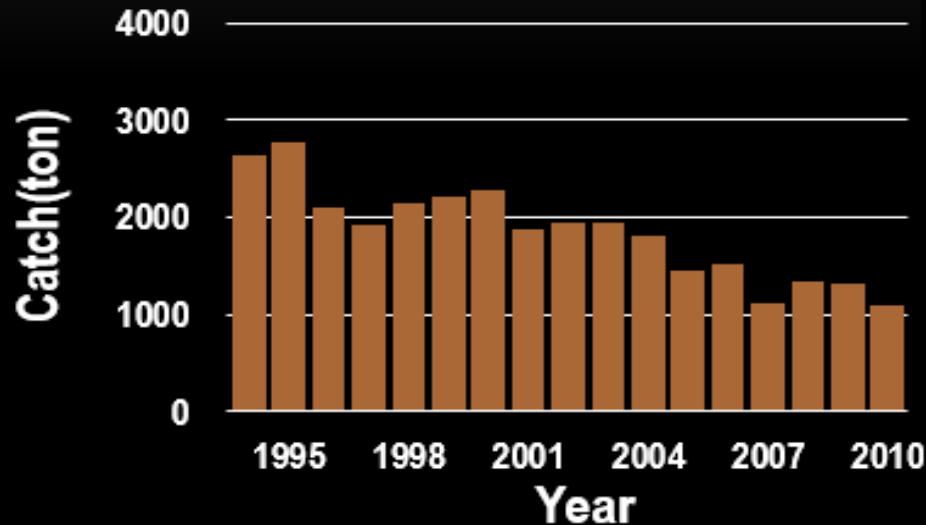


- Classification: Mollusca Gastropoda Turbinidae
- Habitat: Inhabitation rock area of intertidal zone - 20m depth interior and exterior
- Distribution: Ulleung Island, the south coast of Korea, mainly Jeju Island
- Economically important species to Jeju diving woman (Hae-

Nyeou)

Issues

Decrease in Annual catches of turban shell in Jeju island (1968-2013)



- About 2,000 metric tons in 2002 → About 1,000 metric tons in 2010
- A steady decrease of about 50% since 2002
- Similar trend with the decreasing of diving woman number.

Possible reasons of declining the catches

- **Overfishing**
- **Decrease in the number of diving woman**
- **Environmental change**
 - **Whitening event**
 - **Pollution**
 - **Climate change**

✘ No one knows the main reason of reduced catches ✘

Objective

**Analyze the relationship
between the stock status of turban shell
and the biomass of algae.**

Because algae are the major prey of turban shell.

Approach & Methods

The analysis of the relationship between turban shell and algae

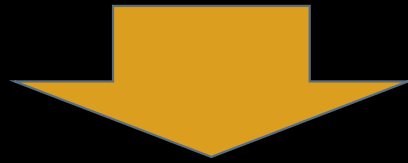


- Selecte algae species: *Ecklonia cava* and *Amphiroa anceps*
- Brown algal species(*Ecklonia cava*) : Feed of turban shell
- Red algal species(*Amphiroa anceps*) : Associated with whitening event
- Collect algae data

Approach & Methods

Characteristics of our data

- 1. Long-term turban shell data collected.**
- 2. Algae data collected only two years (2008, 2010).**
- 3. Algae data is spatially detailed data.**



**Due to the lack of time-based data,
Analyze the relationship between the algae and the turban shell,
using spatial-based data,**

Approach & Methods

Estimate the MSY (Maximum sustainable yield) **of turban shell.**

Analyze the relationship between the wet weight of

***Ecklonia cava* and MSY**

Analyze the relationship between the wet weight of

***Amphiroa anceps* and MSY**

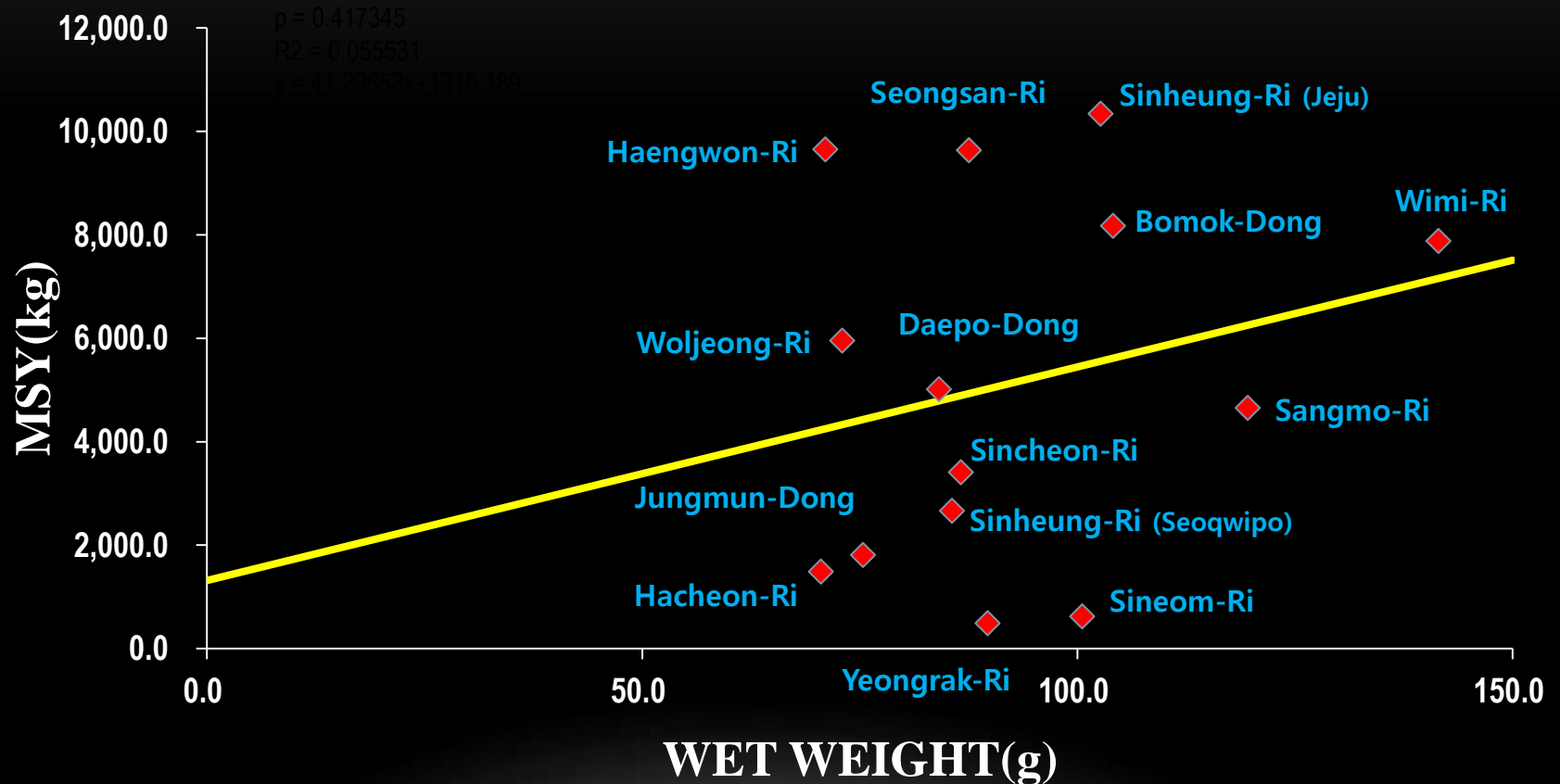
Results

The estimation of MSY (Maximum sustainable yield)



Results

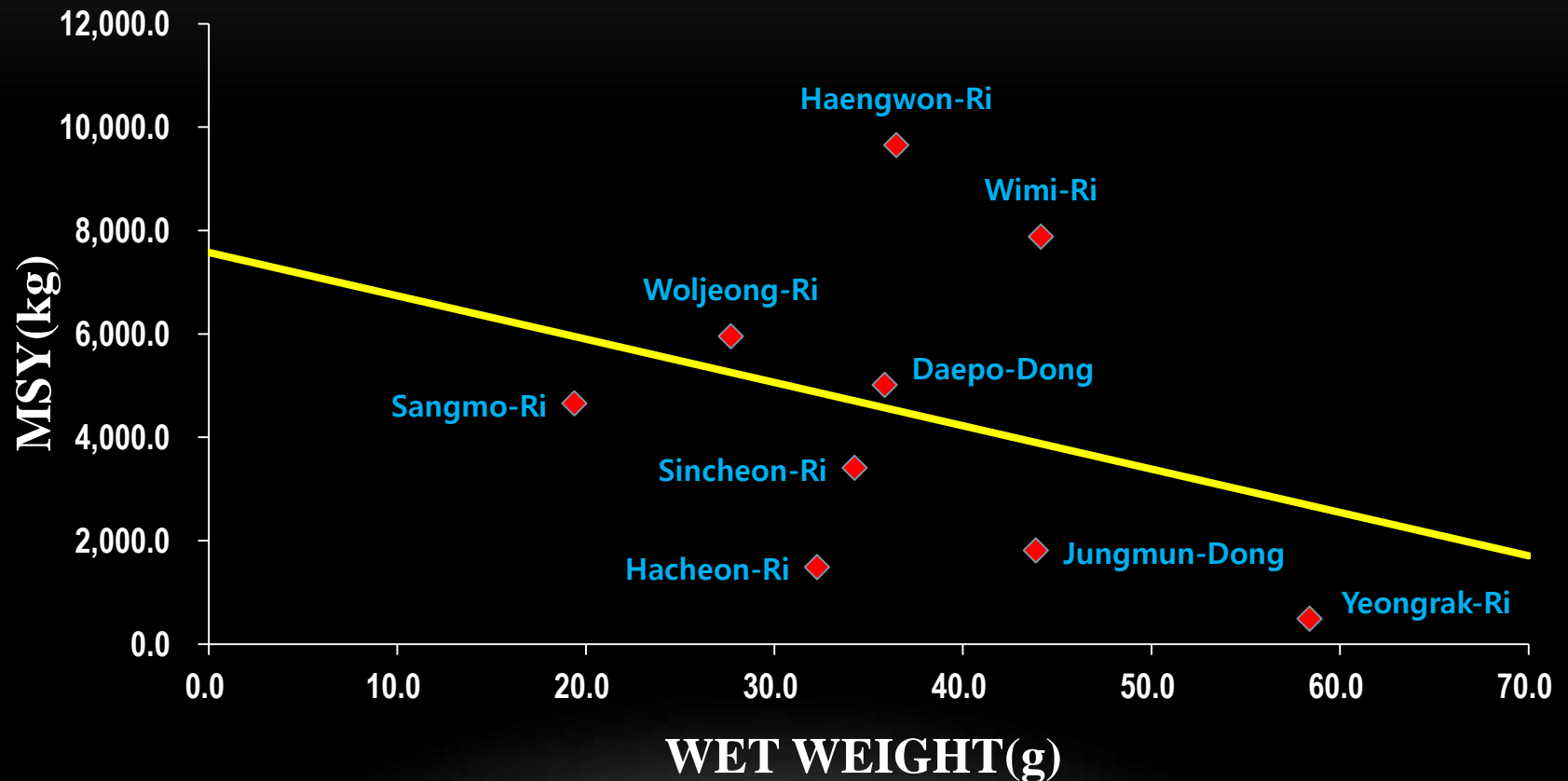
Relationship with *Ecklonia cava* and MSY



➤ Positive relationship between the wet weight of *Ecklonia cava* and MSY

Results

Relationship between *Amphiroa anceps* and MSY



➤ Negative relationship between the wet weight of *Amphiroa anceps* and MSY

In the future
in the future



Future direction of research

Consideration to the time-based and spatial data of seaweed colony

Analyze of the relationship between sea level of seaweed distribution and catches of turban shell through time-based, spatial data

Identify the effect for decreasing of seaweed colony to biomass of turban shell

Expectation of increase in turban shell species by protecting seaweed colony

Thank you