

Global warming game changer

February 2023



Shabondama Soap Co., Ltd

Features and effectiveness of Eco-friendly Soap-based Class A Foam For forest fire and peat fire control



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Shabondama Soap Co., Ltd



Experience in Overcoming Pollution & Environmental Policies

1901



Start of operations at Yawata Steel Works

Development as an iron-producing city

1950



Intense pollution problems

1960~

Pollution control policies

Anti-pollution movement
by women's groups



Residents

Businesses

Government

Effort by Businesses

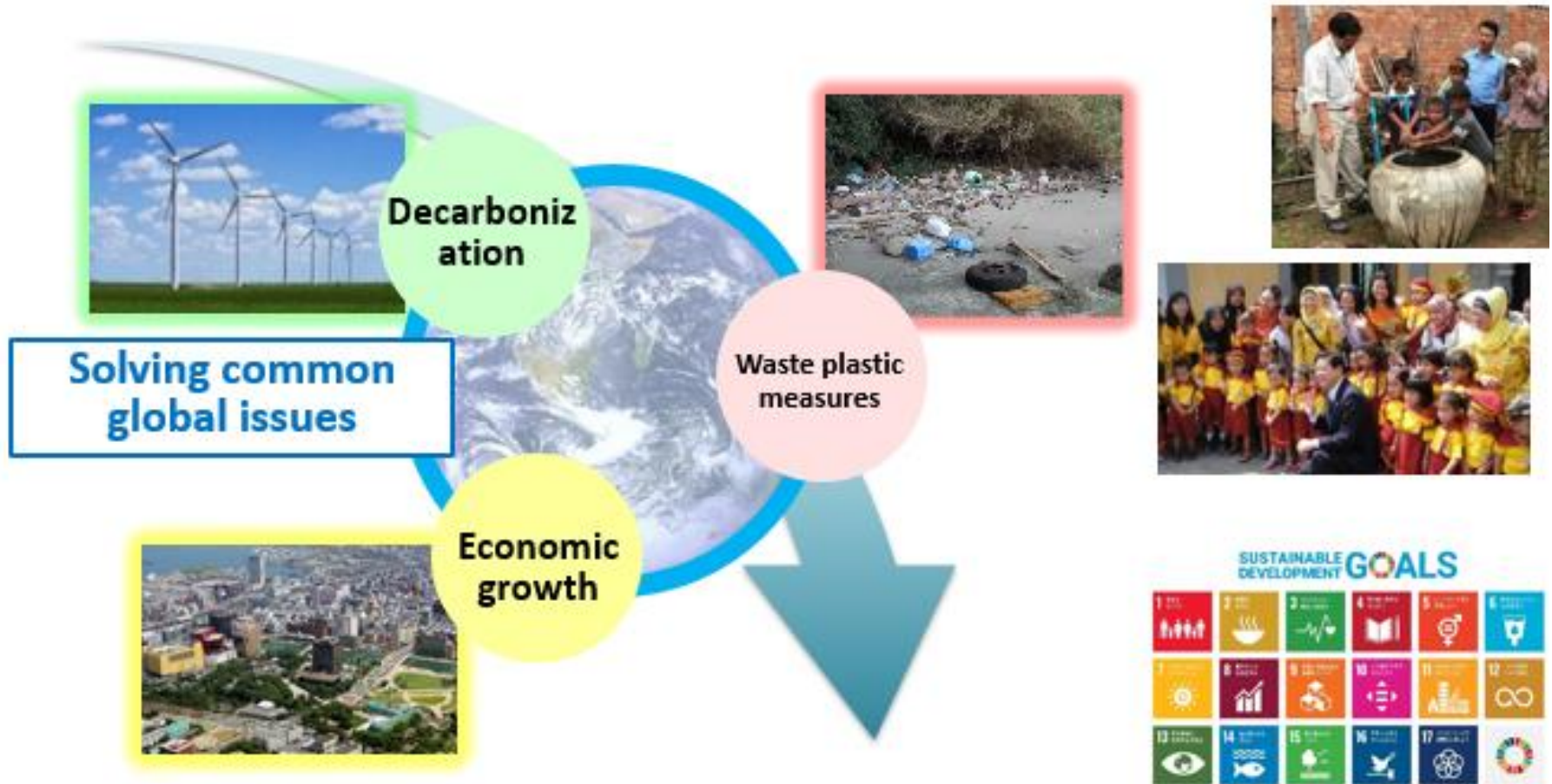


Government initiatives

Overcame pollution



Finding Solutions to Common Global Issues with Kitakyushu's Environmental Technologies



and helping the world achieve the SDGs!!

Company introduction

Corporate Vision : Protect healthy body and clean water



Head office: Wakamatsu-ku, Kitakyushu city, Fukuoka Prefecture

Establishment: 1910

Sales: 8,9 billion yen

Capital: 100million yen

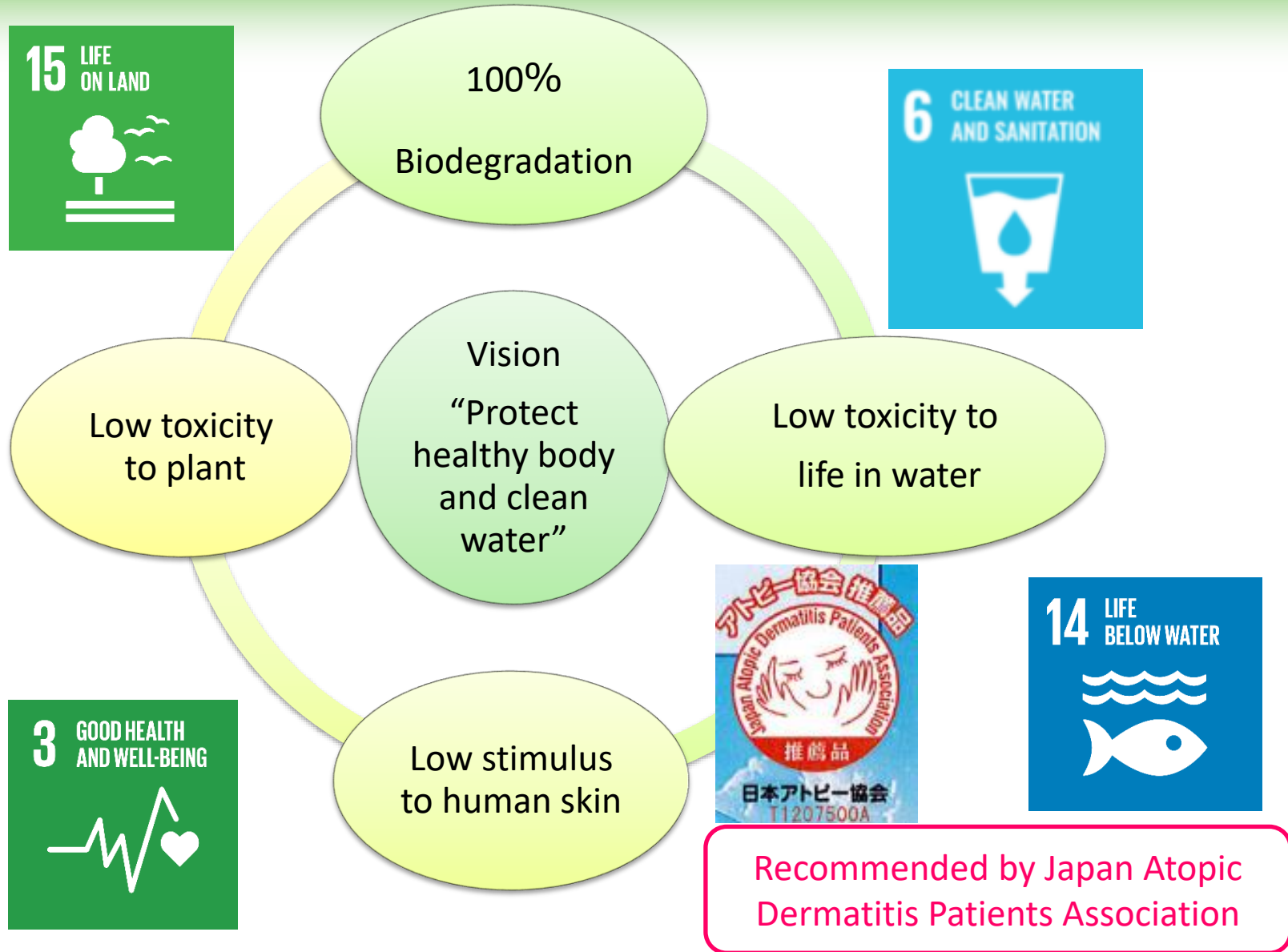
Employee: 153 staffs

(Average age: 34, Male : Female ratio 4 : 6)

Company introduction



About soap



Products based on the vision “Protect healthy body and clean water” contributes to the goal 3 (Health), 14 (Ocean), 15 (Land)

Background for Development of Soap-based Fire-fighting Foam

- 1995 The Great Hanshin-Awaji Earthquake**
- 1999 Use of chemical firefighting foam by Kitakyushu City Followed by Tokyo Fire Department**
- 2001 Development of a new fire fighting foam based on soap Kitakyushu Fire Department, Shabondama Soap, Furukawa Techno Material**
- 2003 Initiative by Fire and Disaster Management Agency to promote science and technology for fire prevention Participation of University of Kitakyushu**
- 2007 Sales of “Miracle Foam”**

Soap-based ClassA Foam

High firefighting effect

Wettability, Penetrability



Fast defoaming

Bubbles disappear immediately

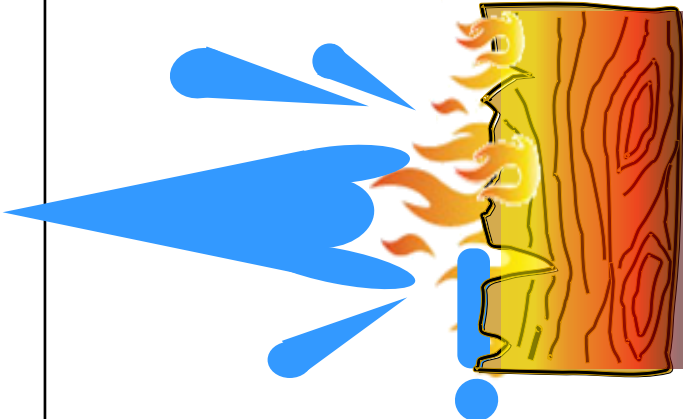
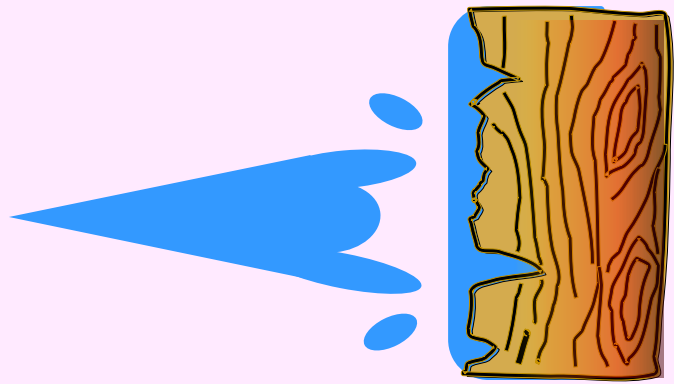

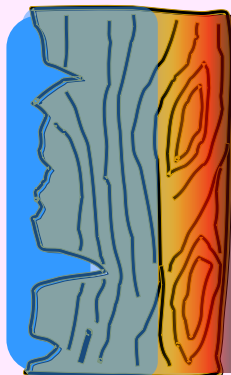
Eco-friendly

Low toxicity, 100% Biodegradation

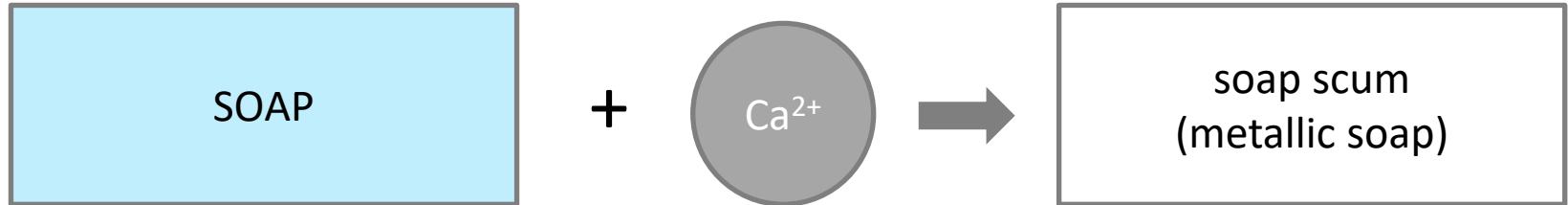


Soap-based ClassA Foam is specifically for fresh water and the concentration for use is 1%.

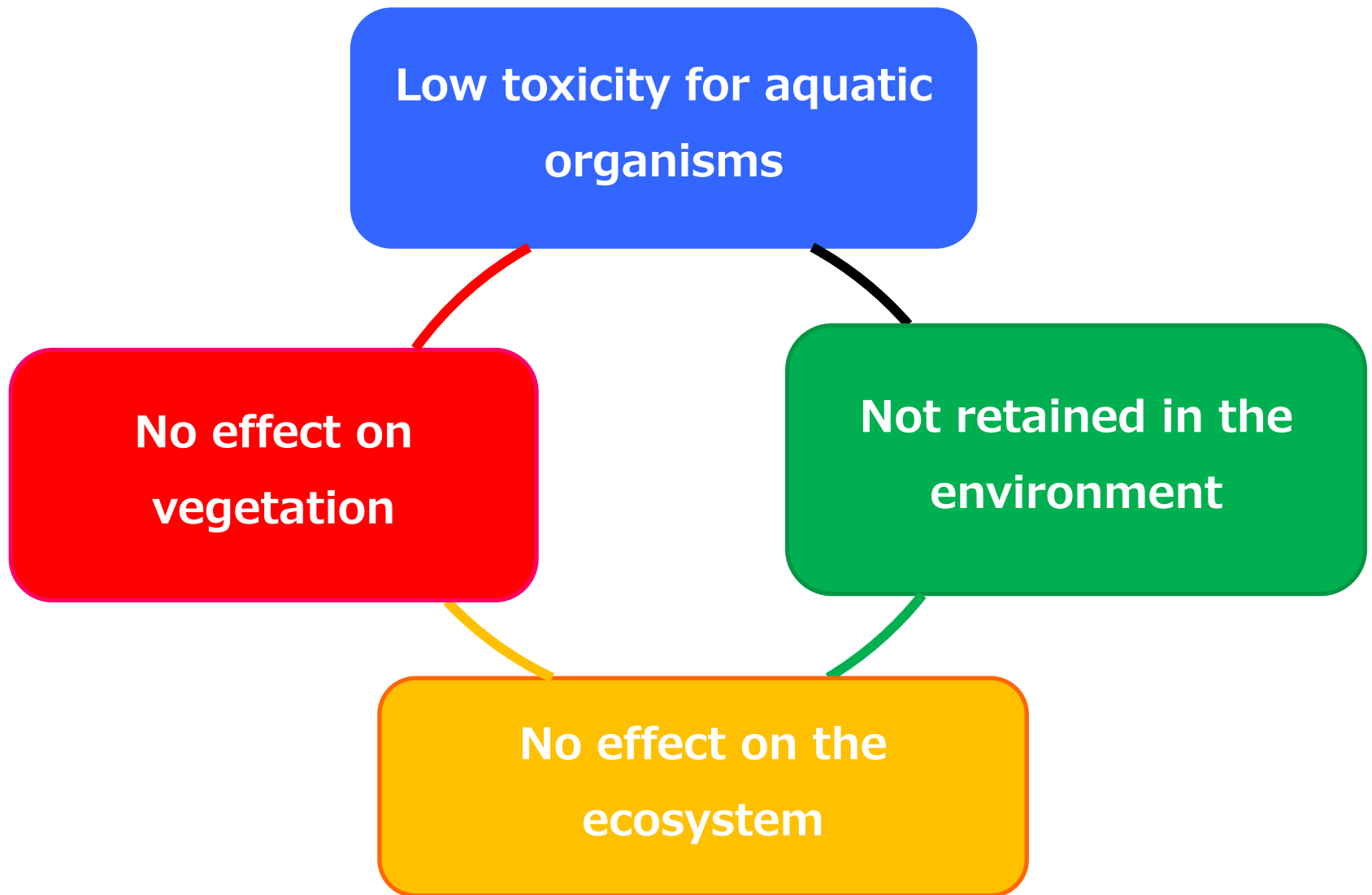
Why is foam that a fire extinguishing effect is high?

	Water	Firefighting agent
Wettability	 <p>Water jets are shown being repelled by the surface of a burning log. The water does not reach the fire.</p> <p>Hard to get wet</p>	 <p>A firefighting agent jet is shown penetrating the surface of a burning log, reaching the fire.</p> <p>Easy to get wet</p>
Penetrability	 <p>The water is shown on the surface of the log, unable to penetrate the burning area.</p> <p>Hard to penetrate</p>	 <p>The firefighting agent is shown penetrating the log, reaching the burning area.</p> <p>Easy to penetrate</p>

Fast defoaming



Eco-friendly



Low toxicity to organisms

- Half lethal concentration for green paramecium (LC_{50})

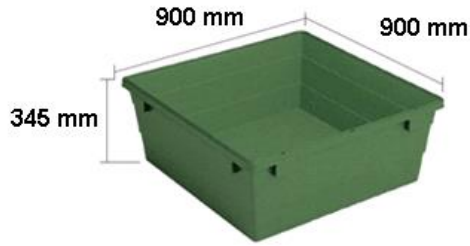
	DDW(ppm)	TAP WATER 道水(ppm)
Soap-based fire extinguishing agent	370	1000
Synthetic fire extinguishing agent A	160	80
Synthetic fire extinguishing agent B	230	100
Synthetic fire extinguishing agent C	80	38
Synthetic fire extinguishing agent D	39	16

10 times more for soap Low toxicity.

Experimenter: Professor Kawano, University of Kitakyushu 2016/7/15

Low toxicity to Aquatic organisms

Model biotope test



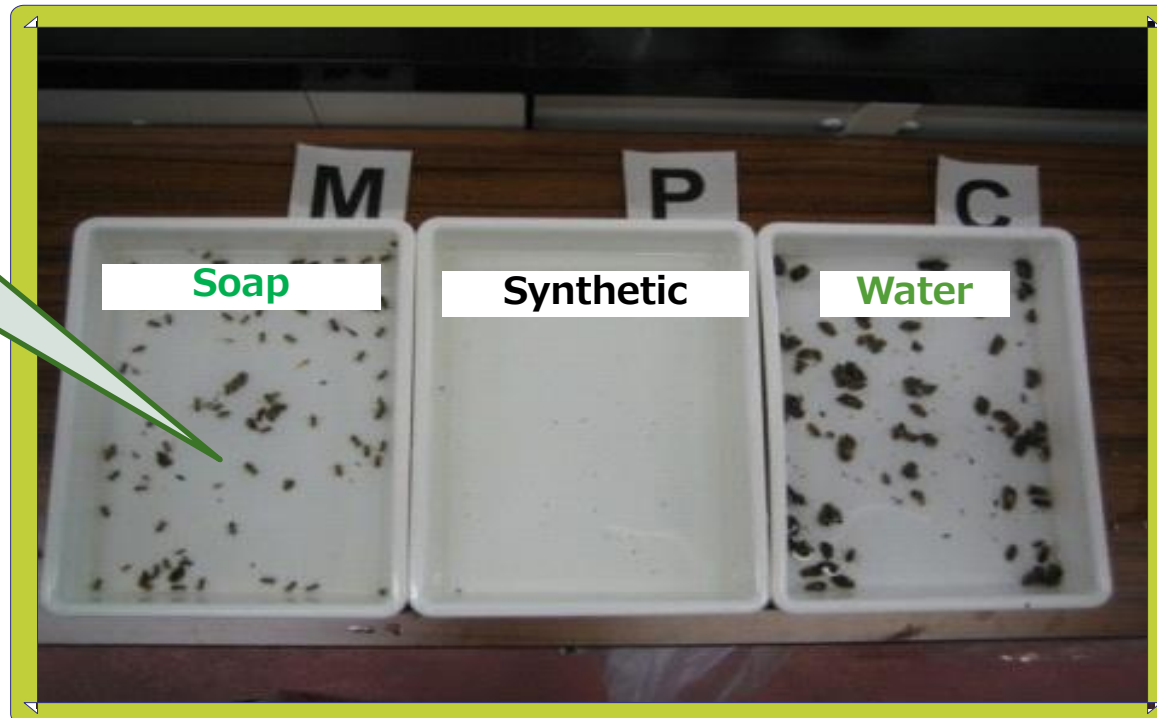
Before



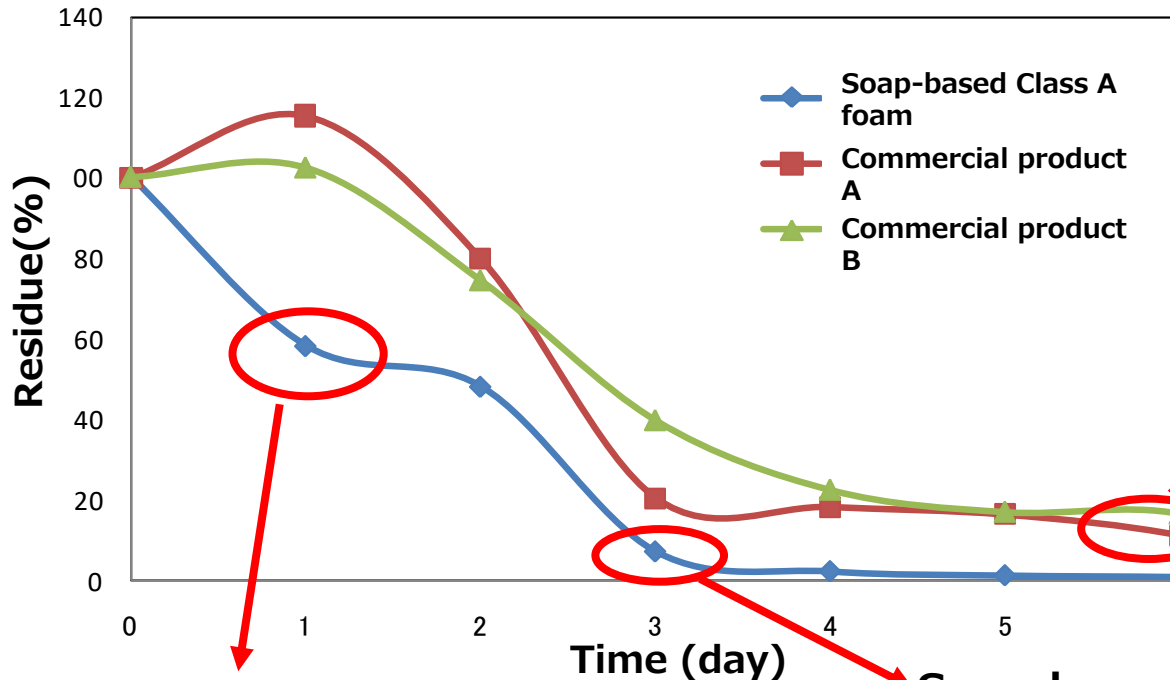
Spraying



7 months later



Not remain in the environment



Concentration : 1000
[mgCOD/L]
Temperature : 25°C
Phosphate buffer (pH=7.2)
500 ppm

The commercial products:
About **20%** was remain

Soap-based Class A foam :
About **40%** was degraded

Soap-based Class A foam :
About **90%** was degraded

Low impact on the ecosystem

Test Laboratory: Research and Development Center of
Fire and Environmental Safety, The University of Kitakyusyu

Not affect vegetation

	Soap-based	Water
Before	 A rectangular plot of land enclosed by corrugated metal sheet piling. The ground is covered with dry leaves and some sparse green vegetation. In the background, there are trees and a building.	 A rectangular plot of land enclosed by corrugated metal sheet piling. The ground is covered with dry leaves and some sparse green vegetation. In the background, there are trees and a building.
After	 The plot is now covered with a thick layer of white foam or soap residue. Several people are standing around the plot, and a white banner is visible in the background.	 The plot is now covered with a thick layer of dark, wet soil or mud. Several people are standing around the plot, and a white banner is visible in the background.
01 months later	 The plot is now covered with a dense layer of green vegetation, including various plants and trees. The corrugated metal sheet piling is still visible.	 The plot is now covered with a dense layer of green vegetation, including various plants and trees. The corrugated metal sheet piling is still visible.

Not affect vegetation



Use-case of soap-based Class A foam in wildfire

- **Case of wildfire in Kitakyushu**



Other case

- ✓ Aerial firefighting with a helicopter using Water
- ✓ Aerial firefighting times: 31 times
- ✓ Amount of water: 15,500 L
- ✓ Burnt area: about 33ha

About wildfire and firefighting activity

- ✓ Aerial firefighting with a helicopter using soap-based Class A foam
- ✓ Aerial firefighting times: 18 times
- ✓ Amount of water: 9,000 L
- ✓ Fire extinguished: about 2 hours
- ✓ Burnt area: about 17ha

【Effects of Soap-based Class A foam】

- ✓ **The fire could be extinguished with a one-time spray of water.**
- ✓ **Reignition did not occur after spraying.**
- ✓ **For the pilot, “After spraying, we could visually confirm that the fire had been successfully extinguished because the foam remained.”**

Burning field in Kitakyushu

Introduce of burning field in Kitakyushu

Objects:

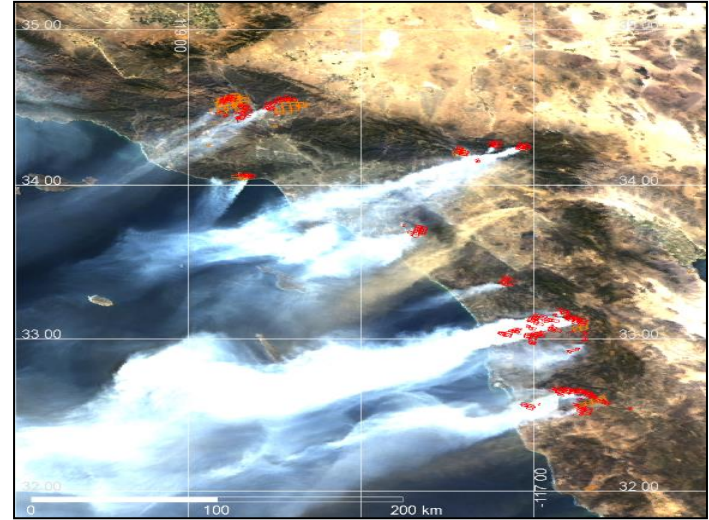
- ✓ Property preservation of local residents against forest fires,
- ✓ Ensure safety and prevent danger to tourists

*Burning an area of about 340 ha.



Kitakyushu Fire and Disaster Management Bureau support the burning field by caution of runaway fire and firefighting.

Wild fire



Presentaiton and exhibition



FDSC
WHERE LEADERS COME TO TRAIN

April 16-21, 2012
Indiana Convention Center &
Lucas Oil Stadium Indianapolis, IN



WILDFIRE 2011
The 5th International Wildland Fire Conference

South Africa

May 9-13

**Thank you for your
attention.**

