Climate information for industrial operators

~ Using climate information to reduce the influence of weather! ~

Part of a JMA project to promote climate risk reduction in various industries using two-week forecasts.

Two processes are particularly important in taking advantage of extreme climate conditions (such as heat waves and cold spells) and reducing related risks : (1) quantitative evaluation to determine the influence of the climate using weather observation data, and (2) appropriate response based on the utilization of climate prediction data such as Early Warning information on Extreme Weather (two-week forecasts). Details of climate risk management (CRM) for the apparel industry are provided below.
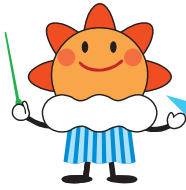
Japan Meteorological Agency

① Climate risk evaluation in the apparel industry
～ Relationship between apparel sales and climate ～

● Relationship between long boot sales and temperature
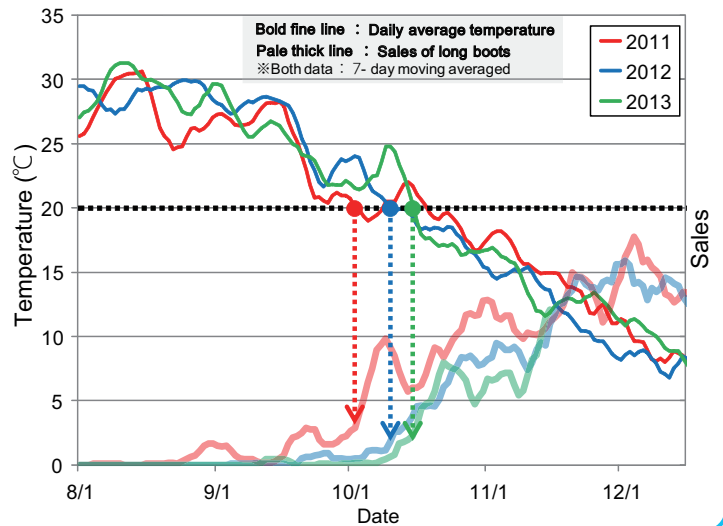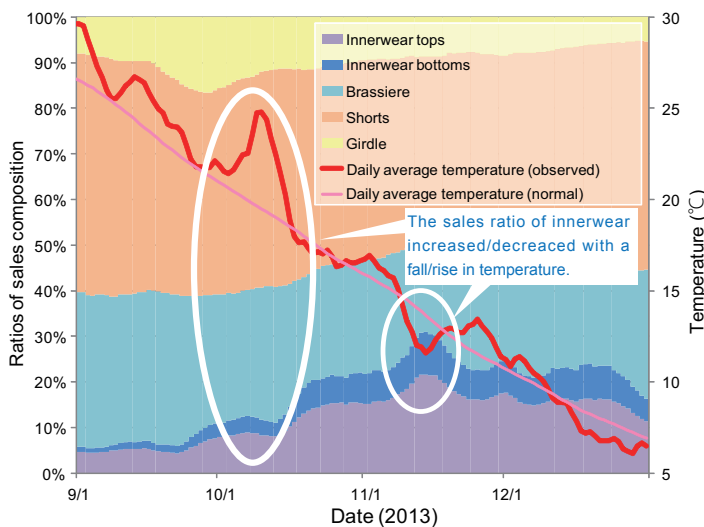
Resarch result
Sales of long boots increase remarkably when the daily average temperature falls below 20℃.

Comment from a contributing company
It has become clear that the threshold temperature will always be 20℃, even though the time when the sales of long boots increase may vary by up to two or three weeks.


Bold fine line : Daily average temperature
Pale thick line : Sales of long boots
※Both data : 7- day moving averaged

2011　2012　2013

Temperature (℃) / Sales / Date

● Relationships between sales ratios of five major innerwear items and temperature

Ratios of sales composition / Temperature (℃) / Date (2013)

Innerwear tops
Innerwear bottoms
Brassiere
Shorts
Girdle
Daily average temperature (observed)
Daily average temperature (normal)

The sales ratio of innerwear increased/decreaced with a fall/rise in temperature.

Resarch result
The sales ratio of innerwear increases from the end of September and fluctuates finely with changes in temperature.
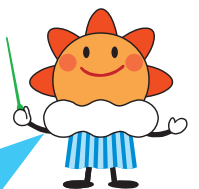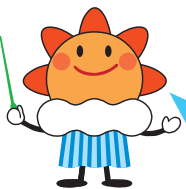
Comment from a contributing company
It's surprising that the sales ratio of each item shows clear changes in line with temperature. The results help us discuss store promotions in consideration of temperature forecasts.

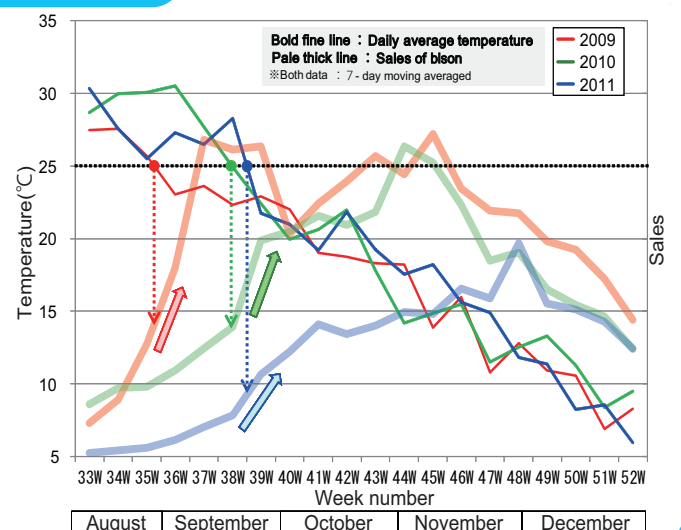## ● Relationship between blouson sales and temperature

Resarch result
Sales of blouson increases as the temperature drops in early autumn. Sales increase remarkably when the daily average temperature falls below 25℃.

Comment from a contributing company
Through this research, we found a clear relationship between sales and temperature. We are sure that effective use of climate information will help to boost sales.

Bold fine line : Daily average temperature
Pale thick line : Sales of bison
※Both data : 7 - day moving averaged

2009　2010　2011

Temperature(℃) / Sales

Week number: 33W 34W 35W 36W 37W 38W 39W 40W 41W 42W 43W 44W 45W 46W 47W 48W 49W 50W 51W 52W

| August | September | October | November | December |

Other studies and details :
http://www.data.jma.go.jp/gmd/risk/en/apparel.html

This research was conducted to establish best practices in CRM in line with a recommendation from Japan's Council for Transport Policy. The research was conducted in collaboration with the Japan Apparel Fashion Industry Council (JAFIC).

② Climate risk treatment in the apparel industry
～ Measures based on two-week forecasts ～

Case study involving a shoe company

The research results indicate that sales of long boots increase remarkably when the average temperature falls below 20℃.

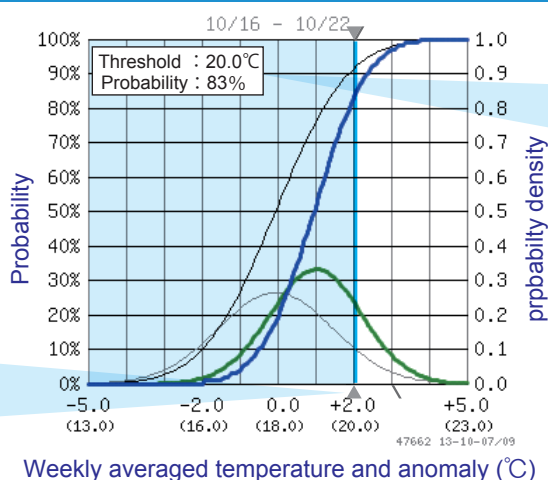**Two-week forecasts can be used to decide appropriate action in retail environments as outlined below.**

STEP 1

Access the two-week forecast web page.(※1)

A case of Tokyo（selectable）▲

STEP 2

Move this bar to the target temperature (20℃ in this case).

10/16 - 10/22

Threshold : 20.0℃
Probability : 83%

Probability

prpbability density

Weekly averaged temperature and anomaly (℃)

-5.0 (13.0)　-2.0 (16.0)　0.0 (18.0)　+2.0 (20.0)　+5.0 (23.0)

47662 13-10-07/09

STEP 3

In this case, the probability of the average temperature falling below 20℃ in the coming two-week period is 83%. Measures can be planned accordingly.

Plan:
Stock up on long boots, strengthen in-store promotion,etc.

Effective measures suggested by contributing companies

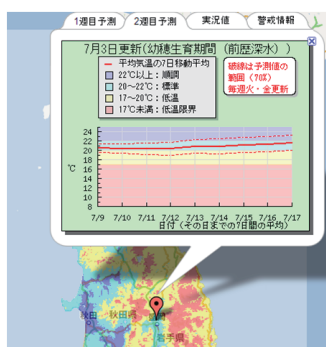| Change the volume of arranged items. | Start proactive recommendation of target items. | Strengthen visual merchandising (VMD). | Adjust the volume of stock delivered from warehouses to stores. |

Climate risk management in other sectors

Agriculture（※2）

Period	Threshold temperature	Anxious disease
From mid-July to the beginning of August	20℃ or less	Barren obstacle
first 10 days of August	20℃ or less	Barren obstacle
During August	27℃ or more	Heat damage

7月3日更新(幼穂生育期間（前歴:深水）)
平均気温の7日移動平均
22℃以上：順調
20～22℃：標準
17～20℃：低温
17℃未満：低温限界
破線は予測値の範囲（70%）
毎週火・金更新

Rice crops are influenced by temperature at each stage of growth (see table).
Agricultural weather information using JMA's temperature prediction up to two weeks ahead is issued tentatively （※3） and this information is useful for working out measures to extreme weather.

Electricity Supply

To cope with the critical issue of electricity supply, JMA issues forecasts of maximum high temperatures for the period two weeks ahead.
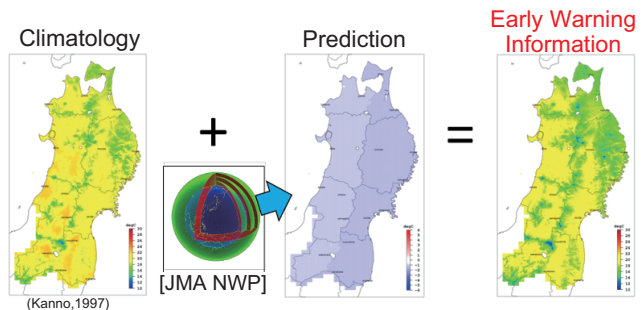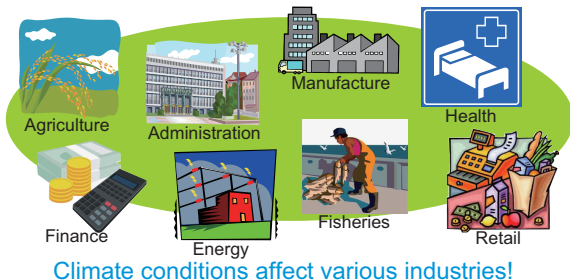This information is utilized for electricity forecasts made by all electrical power companies.
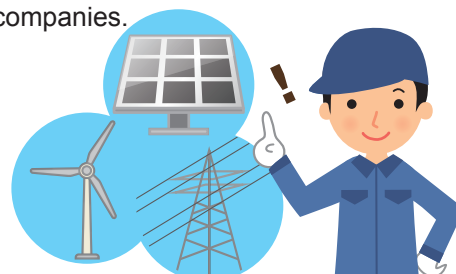
（※1）http://www.data.jma.go.jp/gmd/risk/probability
（※2）To establish best practices in CRM in line in the agricultural industry, JMA and the National Agriculture and Food Research Organization (NARO) have started a pilot project to develop an early warning system using two-week forecasts. It is showed part of the results here.
（※3）This information was provided by "crops warning information using weather prediction data by Google Map" operated by NARO

Useful tools for climate risk management

Web site for climate risk management

Detailed descriptions and CRM case studies are provided on the JMA web page.

Agriculture

Administration

Manufacture

Health

Finance

Energy

Fisheries

Retail

Climate conditions affect various industries!

Climatology

Prediction

Early Warning Information

+

[JMA NWP]

=

(Kanno,1997)

Using climate information to reduce the influence of weather!

http://www.data.jma.go.jp/gmd/risk/en/

Climate risk evaluation — Evaluation using weather observation data —

・Histrical data on weather observations by the Automated Meteorological Data Acquisition System (AMeDAS) are made available.

・Target temperature is comparable with normal temperature, several-year-average temperature, and etc.

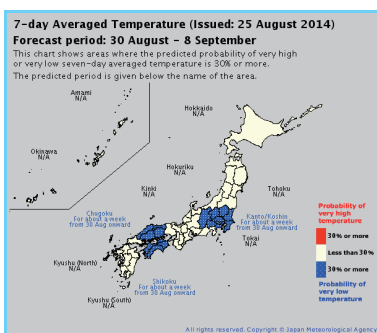・Data can be downloaded in .csv file format.

※ Japanese only

Histrical weather observation data download page

http://www.data.jma.go.jp/gmd/risk/obsdl

Climate risk treatment — Use of forecasts —

Early Warning information on Extreme Weather

7-day Averaged Temperature (Issued: 25 August 2014)
Forecast period: 30 August – 8 September

・This information is issued every Monday and Thursday when extreme climate conditions are predicted up to two weeks ahead.

・Temperature probability forecasts which is the basis of this information are also made available.

Temperature probability forecast page
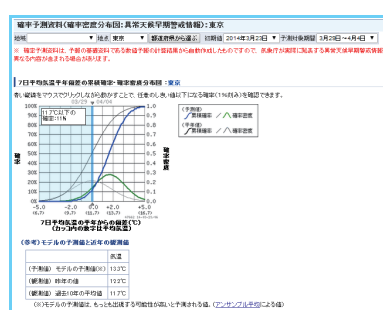
※ Japanese only

・Data on 7-day-average temperature for coming two weeks is made available.

・The probability of temperatures being higher or lower than expected can be found.

・Data can be downloaded in .csv file format.

http://www.jma.go.jp/jp/en/soukei/

http://www.data.jma.go.jp/gmd/risk/probability/

Information on weather, earthquakes and oceans can be found on the JMA website.

http://www.jma.go.jp/jma/indexe.html

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