

1. 業務概要

1) 業務の目的

平成 30 年 11 月に閣議決定された「気候変動適応計画」では、暑熱による国民生活への影響の評価が重大性、緊急性、確信度のいずれにおいても高く、暑熱に対する適応策（暑さ対策）の推進が求められる。また、環境省では、これまでに熱中症予防情報として暑さ指数（WBGT、湿球黒球温度）を提供してきたが、気候変動適応の観点からも、国民一人一人が暑さ指数を効果的に活用して、暑さ対策を実施していく必要がある。

そこで本業務では、地方公共団体における適応策実施の推進及び、暑さ指数の活用に向けた調査を行った。

2) 業務履行期間

平成 31 年 4 月 1 日～令和 2 年 3 月 31 日

3) 業務内容

(1) 地方公共団体における適応策の推進

①面的な暑熱対策の推進

ア) 推進事例調査

地方公共団体等で取り組む暑熱対策のうち、面的に対策を実施している 3 つの事例を取り上げ、効果に関する情報を収集した。情報収集にあたっては、3 箇所ヒアリングを行った。

イ) 効果検証調査

人が多く集まる観光地等で暑さ対策が実施される取り組みを 3 箇所程度、取り上げ、夏季に対策効果の検証を行った。

②適応策の計画的な推進

ア) 進捗点検事例調査

地方公共団体で取り組む暑熱適応策について、取り組みの推進に重要である施策の進捗把握に関して、地方公共団体における施策の点検事例や施策の効果分析事例などについて、調査票の送付やヒアリングを通じて情報を収集した。

イ) 試行的分析

熱中症予防や暑熱関連施策の効果分析について、具体的な地域を取り上げて試行的に分析を実施した。

(2) 個人における適応策の推進

①日傘の効果検証

個人で実施できる適応策のうち、比較的効果が高い日傘等の日射を遮る対策について、効果の検証を行った。素材等異なる製品について、熱環境改善効果や生理・心理反応を調査することで比較検証を行った。検証は 1 日 8 時間を 4 日間、被験者 6 名で実施した。検証に際しては、有識者 1 名に立ち会っていただき助言を得た。

②日傘の普及啓発

日傘等の効果について、わかりやすい表現を用いた国民向けの資料をデザイン・作成し、夏季に200店舗程度で資料を掲示し、日傘使用の普及啓発を行った。店舗等での掲示後に、資料掲示による日傘等の普及効果について2店舗にヒアリングを実施した。

(3) 暑さ指数の活用等に関する調査

①国民の暑さ指数の活用等に関する意識調査

国民の暑さ指数の認知度等を把握するため、国民を対象とした意識調査を、Web調査を用いて実施した。24問の質問票を作成し、地域別、年代別、性別の各属性別に100サンプル、計6,400サンプルの回答を確保した。質問票の作成にあたっては、「平成30年度暑熱環境に対する適応策調査業務」で実施した意識調査結果を参照し、調査項目の改善を行った。得られた回答について、集計・分析を行い、暑さ指数の今後の活用方法等を考察した。

②暑さ指数の効果的活用に関する調査

学校等で実施されている暑さ指数活用の事例を収集した。

(4) 有識者検討会の開催

業務の実施に当たっては、学識者、地方公共団体、開発事業者らで構成する検討会を2回開催し、意見を伺いつつ遂行した。議事要旨を巻末に添付した。

①第1回検討会

開催日時：令和元年7月8日（月）10：00～12：00

開催場所：一般社団法人 環境情報科学センター 会議室

出席有識者：足永委員、後藤委員、中嶋委員、鍋島委員、成田委員、堀越委員、本條委員、三坂委員

②第2回検討会

開催日時：令和2年1月9日（木）10：00～12：00

開催場所：一般社団法人 環境情報科学センター 会議室

出席有識者：後藤委員、中嶋委員、鍋島委員、成田委員、本條委員、三坂委員

Study on Measures for Adaptation to the Thermal Environment in Fiscal Year 2019

1) Purpose of the study

The Climate Change Adaptation Plan, adopted at a Cabinet meeting in November 2018, contains a request for the promotion of measures for adaptation to summer heat (hereinafter referred to as measures against heat) in recognition of the importance and immediacy of, and the degree of belief in, the impact of summer heat on Japanese people's daily lives. The Ministry of the Environment has provided the heat stress index (wet-bulb globe temperature) as an information tool for preventing heat illness. Each Japanese citizen must make effective use of the heat stress index and take measures against heat from the perspective of climate change adaptation.

This study investigates the promotion of the enforcement of measures against heat and the use of the heat stress index by local public entities.

2) Period of the study

This study was conducted from April 1, 2019 to March 31, 2020.

3) Contents of the study

(1) Promotion of measures against heat by local public entities

A. Promotion of measures against heat by a local public entity in its entire area

a) Investigation of promotion cases

We investigated three cases in which measures against heat taken were taken by a local public entity in its entire area and collected information on the effects of the measures. To collect the information, we held hearings at three locations.

b) Verification of the effects of measures against heat

We investigated three cases in which local public entities took measures against heat at places in which large numbers of people congregate, such as tourist destinations, and verified the effects of measures against heat in the summer season.

B. Systematic promotion of measures against heat

a) Investigation of the progress of measures against heat

To understand the progress of measures against heat, we investigated policies that are important for promoting measures against heat taken by local public entities, by sending a questionnaire to and holding hearings with individual local public entities regarding cases in which the policy had been examined and cases in which the effect of the policy was analyzed, and collected information on the progress of measures against heat.

b) Experimental analysis

Regarding the effects of policies for preventing heat illness and policies related to measures against heat, we selected a specific region and experimentally analyzed the effects of these policies in the region.

(2) Promotion of measures against heat by individuals

A. Verification of the effects of parasols

Regarding the measures against heat taken by individuals, we verified the effects of measures to shield against solar radiation, such as parasols. To verify the effects of parasols, we compared parasols made of different materials by investigating the improved thermal environment and physiological and psychological responses of each individual. In the verification, six subjects used parasols for eight hours a day for four days. Advice was obtained from an expert who was present during the verification.

B. Public awareness of parasols

Regarding the effects of parasols, we designed and created easy-to-understand materials for Japanese citizens, exhibited the materials at approximately 200 shops in the summer season, and performed activities to inform Japanese citizens about the use of parasols. After the exhibition, we held hearings with two shops regarding the influence of these exhibited materials on the use of parasols.

(3) Investigation of the use of the heat stress index

A. Investigation of the awareness of Japanese citizens regarding the use of the heat stress index

We administered a web survey in order to understand the awareness of Japanese citizens regarding the heat stress index. To this end, we created a questionnaire consisting of 24 questions, and obtained 100 samples in each category (a total of 6,400 samples). The categories included region, age, and sex. To create the questionnaire, we referred to the results of the investigation performed in the Study on Measures for Adaptation to the Thermal Environment in Fiscal Year 2018 and improved the investigation items. The obtained answers were totalized and analyzed in order to examine methods using the heat stress index in the future.

B. Investigation of the effective use of the heat stress index

We collected cases in which the heat stress index was used in schools, etc.

(4) Holding meetings attended by experts

We held two meetings consisting of experts, local public entities, and urban development enterprises before performing this study and obtained opinions from these experts regarding measures against heat. The abstract of each meeting is attached to the end of this paper.

A. First meeting

Date: 10:00–12:00 on July 8 (Mon.), 2019

Place: Conference room of the Center for Environmental Information Science

Attendants: Committee Ashie, Committee Goto, Committee Nakajima, Committee Nabeshima, Committee Narita, Committee Horikoshi, Committee Honjo, and Committee Miyake

B. Second meeting

Date: 10:00–12:00 on January 9 (Thu.), 2020

Place: Conference room of the Center for Environmental Information Science

Attendants: Committee Goto, Committee Nakajima, Committee Nabeshima, Committee Narita, Committee Honjo,
and Committee Miyake