日本の国立公園におけるレクリエーション価値の解明
Recreational Value of National Parks across Japan

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1．Introduction

National parks are critical in providing recreational value. Traditional valuation of national parks relies on surveys like onsite or online questionnaires. Instead of the time-consuming and resource-intensive survey, the emergence of big data provides a new opportunity for valuation at large scales. Among big data, though social media has been widely used in recreational value research, it is biased due to the user group and usage frequency. In this study, using a GPS-based mobile phone data set, we show how big data can be applied to recreational value evaluation at a national scale.

2．Method

DOCOMO data set is a GPS-based mobile phone data set, providing the population number of the target area at a certain time (highest resolution: hour) by origin (home prefectures or cities) of the population. We extracted the data of national parks, and calculated the daily population by origin and parks. The monthly trend of the population in the parks was analyzed. The data was then summarized into yearly data. We further calculated the distance between the home locations and the parks, and the visiting rate based on visitor number and home location population. A zonal travel cost model was applied based on the visiting rate of the visitor population and travel distance, and the consumer surplus of each park was calculated and compared.

3．Results

The monthly visitor number of national parks varies (Figure 1 shows the trend of some parks). Figure 2 shows the consumer surplus (Japanese yen per trip) of some national parks. Fuji-Hakone-Izu national park and Aso-Kuju national park had the highest consumer surplus.

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4．Conclusion

The case study shows how big data can be used for the valuation of national parks with a travel cost model. Compared to the traditional survey method, the big data-based method is less resource-intense and of higher spatial and temporal resolution.

References

Kubo, T., Uryu, S., Yamano, H., Tsuge, T., Yamakita, T., Shirayama, Y., 2020. Mobile phone network data reveal nationwide economic value of coastal tourism under climate change. Tourism Management 77, 104010.

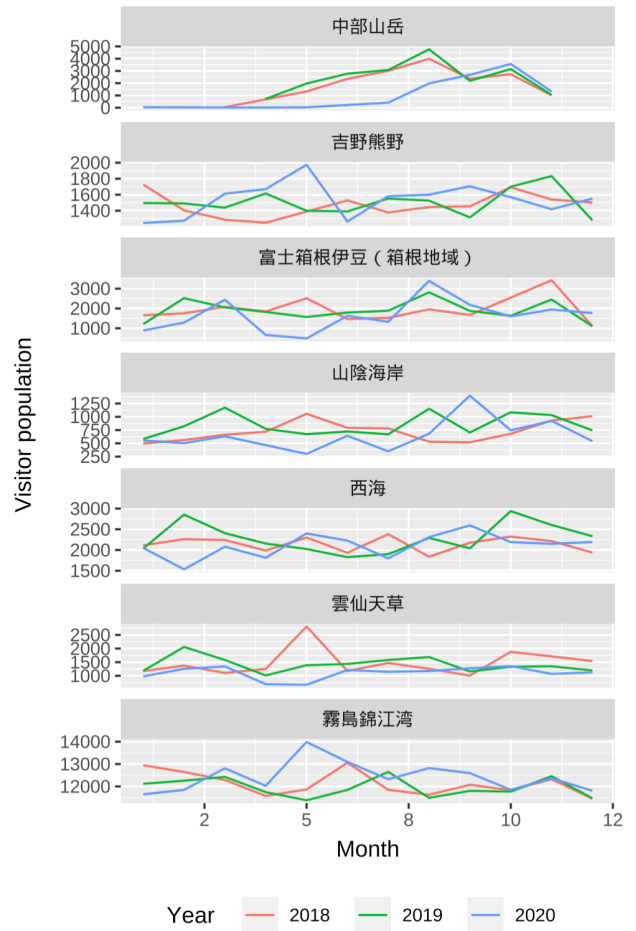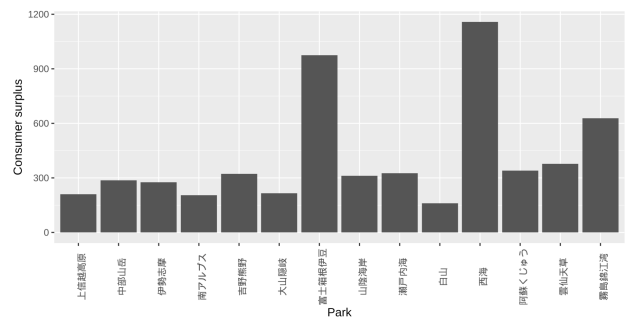**Fig 1 Monthly visitor number of national parks.**

Fig 2 Consumer surplus of national parks