

INTISARI

Fenomena *Urban Heat Island* (UHI) adalah kondisi ketika suhu di perkotaan lebih tinggi dibandingkan daerah sekitarnya. Permukaan perkerasan jalan yang mencakup 20-40% luas perkotaan (Rahman dkk., 2023), berkontribusi signifikan terhadap fenomena UHI. Perkerasan seperti aspal, beton, dan *paving block* menyerap sebagian besar radiasi matahari. Apabila albedo perkerasan rendah, maka radiasi matahari yang diserap lebih banyak daripada perkerasan beralbedo tinggi. Penelitian ini bertujuan untuk mengetahui variasi albedo pada berbagai tipe perkerasan dan perubahan albedo seiring waktu pada tipe-tipe perkerasan tersebut, serta pengaruh albedo terhadap suhu permukaan perkerasan.

Metode yang digunakan meliputi observasi dan analisis kuantitatif pada sampel perkerasan yang berbeda lokasi dan jenis perkerasannya. Pengukuran nilai albedo menggunakan albedometer yang mengacu pada ASTM-E 1918-21. Sedangkan pengukuran suhu menggunakan *thermocouples temperature recorder*. Data yang diperoleh diolah mengacu pada penelitian NCAT 2019 dengan menggunakan *Microsoft excel*. Penelitian ini terdiri dari 39 titik perkerasan aspal, 30 titik perkerasan beton, dan 24 titik *paving block*, serta 3 lokasi yang memiliki 2 jenis perkerasan berbeda, yaitu aspal-beton, beton-*paving block*, dan aspal-*paving block*.

Hasil penelitian menunjukkan variasi signifikan nilai albedo berdasarkan jenis dan usia perkerasan, dengan nilai albedo berkisar antara 0,05 hingga 0,23. Berdasarkan penelitian, telah dikembangkan model untuk memprediksi perubahan albedo terhadap bertambahnya usia perkerasan, yakni per tahun albedo perkerasan aspal meningkat sebesar 0,008, perkerasan beton menurun sebesar 0,06 dan *paving block* menurun sebesar 0,03. Selain itu, pada siang hari 2 jenis perkerasan yang berbeda memiliki perbedaan suhu rata-rata antara 0,3°C hingga 6°C serta terdapat penurunan suhu sekitar 0,21°C hingga 1,2°C pada setiap kenaikan nilai albedo sebesar 0,01.

Kata kunci: *Urban Heat Island* (UHI); albedo; reflektivitas perkerasan; suhu perkerasan; perubahan albedo; perkerasan aspal; perkerasan beton; *paving block*; perkerasan

ABSTRACT

The phenomenon of the Urban Heat Island (UHI) is defined as a condition in which the temperature in urban areas is higher than in surrounding areas. It has been estimated that pavement surfaces, which cover between 20% and 40% of urban areas (Rahman et al., 2023), contribute significantly to the UHI phenomenon. Pavements such as asphalt, concrete and paving blocks absorb the majority of solar radiation. The albedo of a pavement surface is a measure of its ability to reflect solar radiation. When the albedo of the pavement is low, more solar radiation is absorbed than in high albedo pavements. This study aims to determine the variation of albedo in various types of pavement and the change of albedo over time in these pavement types, as well as the effect of albedo on pavement surface temperature.

The methods employed included observation and quantitative analysis of pavement samples from various locations and pavement types. The albedo value was measured using an albedometer in accordance with ASTM-E 1918-21, while temperature was recorded using thermocouples and a temperature recorder. The data was processed in accordance with the NCAT 2019 research using Microsoft Excel. The research comprises 39 asphalt pavement points, 30 concrete pavement points, and 24 paving block points, as well as three locations with two different pavement types: asphalt-concrete, concrete-paving block, and asphalt-paving block.

The results demonstrated significant variations in albedo values based on pavement type and age, with albedo values ranging from 0.05 to 0.23. Based on the research, a model has been developed to predict changes in albedo with increasing pavement age. Specifically, the albedo of asphalt pavement increases by 0.008 per year, while that of concrete pavement decreases by 0.06 and that of paving blocks decreases by 0.03. Furthermore, during the day, the two different pavement types exhibit a mean temperature difference of between 0.3°C and 6°C. Additionally, there is a decrease in temperature of approximately 0.21°C to 1.2°C for every 0.01 increase in albedo value.

Keywords: Urban Heat Island (UHI); albedo; pavement reflectivity; pavement temperature; change in albedo; asphalt pavement; concrete pavement; paver; pavement