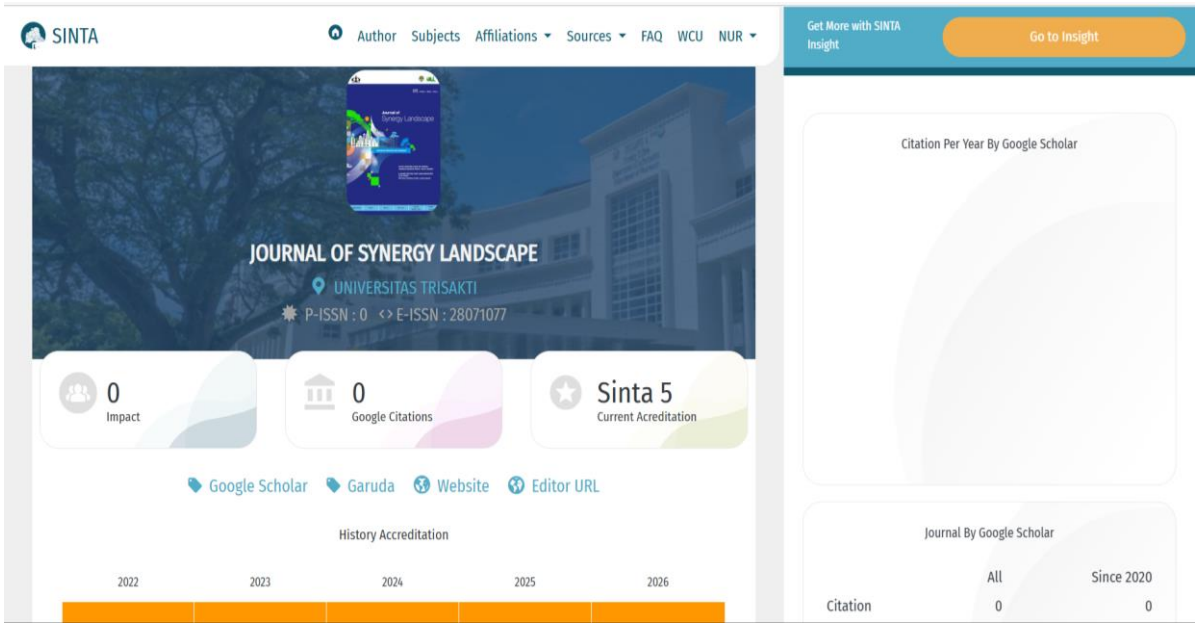
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CONTENTS

Journal of Synergy Landscape
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JOURNAL OF SYNERGY LANDSCAPE VOL 1. NO. 1 AUGUST 2023

Journal of
Synergy Landscape
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THERMAL COMFORT ANALYSIS STUDY AT THE FACULTY OF SPORTS SCIENCE, CENDERAWASIH UNIVERSITY, JAYAPURA-PAPUA

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ABSTRACT

The area of the Faculty of Sports Science, University of Cenderawasih, is the embodiment of campus open space that must consider comfort for the needs of local users. This area consists of lecture buildings, entrepreneurship buildings, football stadiums, as well as several sports arenas such as volleyball, futsal, basketball, tennis, and badminton arenas. The campus of the Faculty of Sports Science has an area of 5 hectares in which there is open space. The purpose of this study is to determine the level of comfort in campus open spaces through measurements of air temperature, air humidity, and wind speed influenced by land cover (vegetation, pavement, water elements, and building orientation) in the campus environment. The theme of the study is the Comfort Zone, which focuses on user comfort to achieve the goal or criteria of thermal comfort in the environment based on the placement of space and human activities in the campus landscape. This research method uses quantitative descriptive methods. Observations were made in several locations on campus open spaces by purposive sampling on each different land cover characteristic using quantitative methods to obtain the Temperature Humidity Index (THI) value. The results showed that uncomfortable locations according to THI value standards were in all locations due to the use of pavement materials that did not absorb heat or vegetation that grew not optimally. This research shows that the presence of vegetation that shades a location can have an impact on decreasing the air temperature in that location.

Keywords: *Comfortable, Thermal, Campus Open Space*

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INTRODUCTION

The area of the Faculty of Sports Science at the University of Cenderawasih is an embodiment of the campus open space, which must consider convenience for the needs of local users. This area consists of lecture buildings, entrepreneurship buildings, football stadiums, as well as several sports arenas such as volleyball, futsal, basketball, tennis, and badminton arenas. Facilities on campus Their function is not only to fulfill the needs of campus users but also to provide thermal comfort for local users so that they can maximize the activities carried out on the site.

According to Nugroho (2011), thermal comfort is a state of the human mind that indicates the level of satisfaction with the thermal environment. In this case, there are several factors that affect thermal comfort, namely in terms of climate (macro and micro) and land cover (building orientation, vegetation, and pavement). Thermal comfort is also a container for activity; outdoor space in the campus area must certainly be able to create a thermally comfortable situation for activity actors (Muhaling et al., 2017; Bebhe et al., 2019; Elbes & Munawaroh, 2019).

Based on the results of the thermal comfort analysis at the Faculty of Sports Science, University of Cenderawasih, the Faculty of Sports Science area itself at some points is still quite hot, and a microclimate has not been created due to the dominance of pavement use, vegetation that grows not optimally, and the placement of vegetation that is not quite right, so that thermal comfort is not maximized in the region. Vegetation affects the outdoor microclimate in terms of the thermal environment and comfort in urban environments (Simangunsong & Fitri, 2021; Yang, 2019).

The purpose of a building is to accommodate activities and provide comfort for its users (Kusumaningrum & Martiningrum 2017; Jieprang 2016). Based on the results of this study, the researchers wanted to redesign the Faculty of Sports Science at Cenderawasih University in order to improve the quality of thermal comfort in the surrounding environment, with the hope of making the area a cool and comfortable place so that visitors can enjoy their activities.

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RESEARCH METHODS

Time and Location

The research location is on Jl. Uncen, Yabansai Village, Heram District, Jayapura City, Papua. The area of the research site is about 5.2 ha, with a KDH of about 60% and a KDB of about 40%. It is bordered by student dormitories and residents' houses to the north, Campus Forest to the east, Jl. Uncen that leads to the rectorate building to the south, and boarding houses to the west.

The determination of the research sample was carried out by purposive sampling based on open characteristics, namely areas surrounded by pavement; semi-open areas, namely areas that have supporting elements (water elements and building orientation); and closed vegetation, namely areas shaded by trees.

The determination of the 3 samples was based on the land cover variable, which, according to Burley (1961) and Lo (1995), describes the vegetation and artificial elements (pavement and buildings) that cover the land surface. Locations are divided into 4 (Location 1, Location 2, Location 3, and Location 4) as a comparison to determine which point is the most ideal for user activity. The selected points have different land cover, which includes vegetation, pavement, and building orientation.

Figure 1. Jayapura City Map and Research Object Map

Sumber: Google Maps, 2022

Data Collection

The research design used in this study is a descriptive method with a quantitative approach. The research method with a quantitative approach uses research data in the form of numbers and is analyzed using statistics. Data collection methods that researchers use in this study are primary data and secondary data. Primary data will be collected through observation, documentation, and literature study.

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RESULTS AND DISCUSSION

Table 1. Observation Points

LOCATION	CODE	CHARACTERISTICS	OBSERVATION POINT
Location 1	T1	Closed	Beside the Futsal Field
	T2	Semi Open	Behind the Volleyball Court
	T3	Semi Open	Next to Badminton Court
	T4	Open	In front of the Basketball Court
Location 2	T5	Open	Next to the parking lot of Building A
	T6	Closed	Next to Building B parking lot
Location 3	T7	Open	Faculty Forest
	Q8	Closed	Faculty Forest
	T9	Closed	Faculty Forest
Location 4	T10	Closed	Area Pedestrian (Entrance)
	T11	Open	Area Pedestrian
	T12	Open	Area Pedestrian

Source: Piet W, 2022

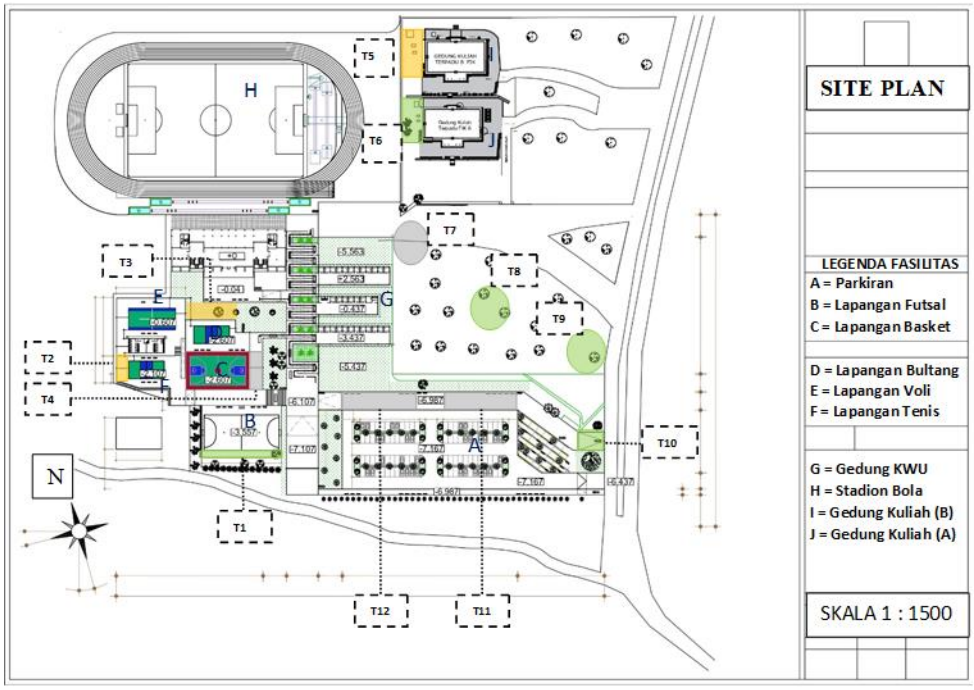

Figure 1. Observation Location Points

Source: Piet W, 2022

In general, all locations on the site are classified as uncomfortable. Based on the research that has been done on the microclimate variable, the highest and lowest air temperatures in the study area are 36.1°C and 27 °C, respectively. The highest and lowest air

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humidity measured in the field were 78% and 42%, respectively. The following is the average of the results of temperature and humidity measurements in the study area, along with the THI values and their categories according to calculations using the Temperature-Humidity Index (THI) formula.

Table 2. Average Measurement Results of Air Temperature and Humidity at Locations 1-2 (Points 1-6) along with THI Values and Their Categories

Measurement Time	Variable Measurement	Research result			
		Location 1 Active Area	Location 2 Semi Active Area	Location 3 Campus Forest Area	Location 4 Circulation Area
Morning 07.00-08.00 WIB	air temperature (°c)	uncomfortable	uncomfortable	uncomfortable	no comfortable
	humidity (%)				
	wind velocity	scale 1 shady	scale 1 shady	scale 1 shady	scale 1 shady
afternoon 12.00-13.00 WIB	air temperature (°c)	uncomfortable	uncomfortable	uncomfortable	uncomfortable
	humidity (%)				
	wind velocity	scale 1 shady	scale 2 weak sepoi	scale 2 weak sepoi	scale 2 weak sepoi
Late Afternoon 17.00-18.00 WIB	air temperature (°c)	uncomfortable	uncomfortable	uncomfortable	uncomfortable
	humidity (%)				
	wind velocity	scale 0 calm	scale 1 shady	scale 1 shady	scale 1 shady

Source: Piet W, 2022

Table 3. Locations 3-4 (Point 7-12) along with THI Values and Categories

Measurement Time	Measurement Time	Average Measurement Results Location 1-2 (Point 7-12)					
		T7	T8	T9	T10	T11	T12
Morning	Air temperature^{O}C	28,53	28,3	28,36	28,63	28,86	29
	Air Humidity (%)	68,33	68	71,33	66,33	66,33	64,33
Price THI		26,78	26,48	26,72	26,29	26,90	26,93
Category		Uncomfortable					
Afternoon	Air temperature^{O}C	34,2	33,16	33,43	34,16	35,53	35,9
	Air Humidity (%)	56	58	56,6	47,66	45	46
Price THI		31,19	30,16	30,52	30,57	33,40	33,89
Category		Uncomfortable					
Late	Air	27,66	27,63	27,6	27,7	27,83	27,93

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Afternoon	temperature^{O}C						
	Air Humidity (%)	73,6	73,67	72,6	75	75,3	75
Price THI		27,49	29,96	26,68	26,68	26,93	27,38
Category		Uncomfortable					

Source: Piet W, 2022

So it can be seen that the research area is included in the uncomfortable category based on the calculation of the THI formula. The uncomfortable category is in the value range of more than 26. The uncomfortable conditions (high temperature with low humidity).

Table 4. Average Wind Speed Measurement Results at Locations 1-2 (Points 1-6) and their Categories

Measurement Time	Measurement Variables	Average Measurement Results Location 1-2 (Point 1-6)					
		T1	T2	T3	T4	T5	T6
Morning	Wind Speed (m/s)	0,16	0	0,53	1,03	0,43	0,53
	Beaufort scale	0	0	1	1	1	1
Category		Calm	Calm	Shady	Shady	Shady	Shady
Midday	Air temperature^{O}C	1,5	0,2	1,03	1,76	2,73	2,4
	Air Humidity (%)	1	0	1	2	2	2
Category		Shady	Calm	Shady	Weak breeze	Weak breeze	Weak breeze
Late Afternoon	Air temperature^{O}C	0	0	0,06	0,3	1,3	1,2
	Air Humidity (%)	0	0	0	1	1	1
Category		Calm	Calm	Shady	Shady	Shady	Shady

Sumber: Piet W, 2022

Table 5. Average Wind Speed Measurement Results at Locations 3-4 (Points 7-12) and their Categories

Measurement Time	Measurement Variables	Average Measurement Results Location 1-2 (Point 7-12)					
		T7	Q8	T9	T10	T11	T12
Morning	Wind Speed (m/s)	0,43	1,26	1,86	0,36	0,3	0,36
	Beaufort scale	1	1	2	1	1	1
Category		Shady	Shady	Weak breeze	Shady	Shady	Shady
Afternoon	Air temperature^{O}C	3,36	1,43	2,2	2,6	2,2	2,73
	Air Humidity (%)	3	1	2	2	2	2
Category		Gentle	Shady	Weak	Weak	Weak	Weak

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		breeze		breeze	breeze	breeze	breeze
Late Afternoon	Air temperature^{O}C	1,06	0,56	0,63	0,16	0,2	0,5
	Air Humidity (%)	1	1	1	0	0	1
Category		Shady	Shady	Shady	Calm	Calm	Shady

Source: Piet W, 2022

The study area is dominated by wind with a shady category or a scale number of 1 based on the Beaufort Scale. This condition is due to the site having open, semi-open and closed characters and the difference in contours between several locations that affect wind direction. Wind speed ranges from a scale number of 0 to 3. The observation point with a scale number of 3 is in an open area of location 3 (Campus Forest) which is not obstructed from the direction of the wind so that the wind is quite felt.

Table 6. Land Cover and Categories

		Land Cover			Category
Location Code	Value THI Afternoon	Vegetation (Type)	Pavement Area (m²)	Building Orientation (Position)	
T1	28,41	Tree Check	1.065,3 m²	-	*Uncomfortable
T2	28,68	-	374,01 m²	The building is on the east side	*Uncomfortable
T3	28,34	Tree Check Grass	411,48 m²	The building is on the east side	*Uncomfortable
T4	28,44	Tree Grass	746,25 m²	-	*Uncomfortable
T5	28,49	-	14,705 m²	The building is on the south side	*Uncomfortable
T6	28,35	Tree	14,705 m²	The building is on the south side	*Uncomfortable
T7	28,48	Grass	-	-	*Uncomfortable
Q8	27,86	Tree Grass	-	-	*Uncomfortable
T9	27,97	Tree Grass	-	-	*Uncomfortable
T10	28	Tree Grass	375 m²	-	*Uncomfortable
T11	29	Grass	375 m²	-	*Uncomfortable
T12	29,4	Grass	375 m²	-	*Uncomfortable

*THI Comfort Standard: Comfortable 24-26, *Uncomfortable > 26*

Source: Piet W, 2022

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In locations with semi-open land cover characteristics, namely locations where there is a building orientation consisting of several locations that have an uncomfortable category, namely the FIK building area (THI 28.68) and Tennis Court (THI 28.49). While locations with closed characteristics are in the Futsal Field area (THI 28.41) and the Faculty Forest area (THI 27.6). From measuring air temperature and humidity through calculating the THI formula in the field, it is uncomfortable in the morning, afternoon and evening. This uncomfortable condition is influenced by the lack of vegetation density. This can also be influenced by the number of repetitions in measuring research variables in the field. In this case, the researcher did three repetitions for each measurement of the research variables in the morning, afternoon and evening.

Table 7. Research Findings

Measurement Time	Variable Measurement	Research result			
		Location 1 Active Area	Location 2 Semi Active Area	Location 3 Campus Forest Area	Location 4 Circulation Area
Morning (07.00-08.00)	Air temperature (°C)	uncomfortable	uncomfortable	uncomfortable	no comfortable
	Humidity (%)				
	Wind velocity	scale 1 shady	scale 1 shady	scale 1 shady	scale 1 shady
Midday (12.00-13.00)	Air temperature (°C)	uncomfortable	uncomfortable	uncomfortable	uncomfortable
	Humidity (%)				
	Wind velocity	scale 1 shady	scale 2 weak sepoi	scale 2 weak sepoi	scale 2 weak sepoi
Afternoon (17.00-18.00)	Air temperature (°C)	uncomfortable	uncomfortable	uncomfortable	uncomfortable
	Humidity (%)				
	Wind velocity	Scale 0 Calm	Scale 1 Shady	Scale 1 Shady	Scale 1 Shady

Source: Piet W, 2022

In addition to the research results table, as a whole it can be seen also from the research results plan of the distribution of thermal comfort at the research location which is shown based on the time of measurement in the field. On the map it is shown in red which indicates that all observation points are included in the uncomfortable category or have a THI index value of more than 26 as follows.

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Figure 3. Map of the Research Results of the Spread of Thermal Comfort Studies at the Faculty of Sports Science, Cenderawasih University in the Morning

Source: Piet W, 2022

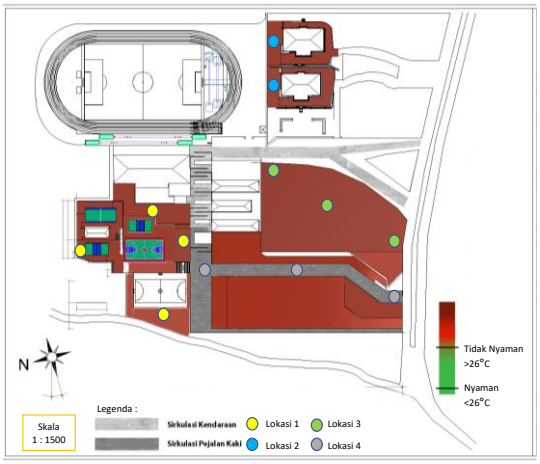

Figure 4. Schematic of the Research Results of the Spread of Thermal Comfort Studies at the Faculty of Sports Science, University of Cenderawasih during the day

Source: Piet W, 2022

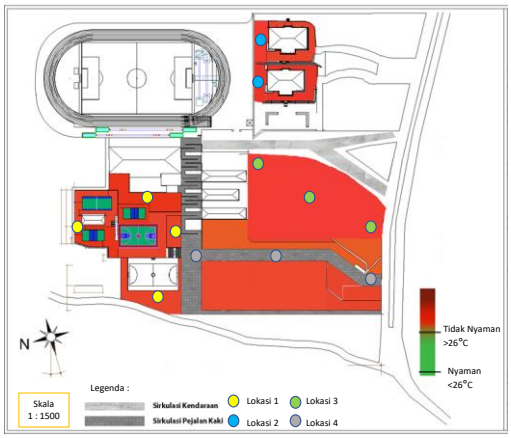

Figure 5. Map of the Research Results of the Spread of Thermal Comfort Studies at the Faculty of Sports Science, Cenderawasih University in the Afternoon

Source: Piet W, 2022

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CONCLUSION

The campus of the Faculty of Sports Science has an area of 5 hectares in which there is open space. The purpose of this study is to determine the level of comfort in campus open spaces through measurements of air temperature, air humidity, and wind speed influenced by land cover (vegetation, pavement, water elements, and building orientation) in the campus environment. The theme of the study is the Comfort Zone, which focuses on user comfort to achieve the goal or criteria of thermal comfort in the environment based on the placement of space and human activities in the campus landscape. This research method uses quantitative descriptive methods. Observations were made in several locations on campus open spaces by purposive sampling on each different land cover characteristic using quantitative methods to obtain the Temperature Humidity Index (THI) value. The results showed that uncomfortable locations according to THI value standards were in all locations due to the use of pavement materials that did not absorb heat or vegetation that grew not optimally. This research shows that the presence of vegetation that shades a location can have an impact on decreasing the air temperature in that location.

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by Nur Intan Simagunsong

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Sumber: Google Maps, 2022

Data Collection

The research design used in this study is a descriptive method with a quantitative approach. The research method with a quantitative approach uses research data in the form of numbers and is analyzed using statistics. Data collection methods that researchers use in this study are primary data and secondary data. Primary data will be collected through observation, documentation, and literature study.

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RESULTS AND DISCUSSION

Table 1. Observation Points

LOCATION	CODE	CHARACTERISTICS	OBSERVATION POINT
Location 1	T1	Closed	Beside the Futsal Field
	T2	Semi Open	Behind the Volleyball Court
	T3	Semi Open	Next to Badminton Court
	T4	Open	In front of the Basketball Court
Location 2	T5	Open	Next to the parking lot of Building A
	T6	Closed	Next to Building B parking lot
Location 3	T7	Open	Faculty Forest
	Q8	Closed	Faculty Forest
	T9	Closed	Faculty Forest
Location 4	T10	Closed	Area Pedestrian (Entrance)
	T11	Open	Area Pedestrian
	T12	Open	Area Pedestrian

Source: Piet W, 2022

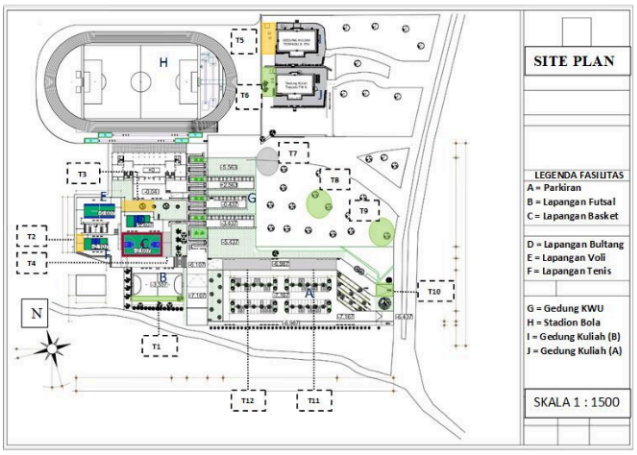

Figure 1. Observation Location Points

Source: Piet W, 2022

In general, all locations on the site are classified as uncomfortable. Based on the research that has been done on the microclimate variable, the highest and lowest air temperatures in the study area are 36.1°C and 27 °C, respectively. The highest and lowest air

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humidity measured in the field were 78% and 42%, respectively. The following is the average of the results of temperature and humidity measurements in the study area, along with the THI values and their categories according to calculations using the Temperature-Humidity Index (THI) formula.

Table 2. Average Measurement Results of Air Temperature and Humidity at Locations 1-2 (Points 1-6) along with THI Values and Their Categories

Measurement Time	Variable Measurement	Research result			
		Location 1 Active Area	Location 2 Semi Active Area	Location 3 Campus Forest Area	Location 4 Circulation Area
Morning 07.00-08.00 WIB	air temperature (°c)	uncomfortable	uncomfortable	uncomfortable	no comfortable
	humidity (%)				
	wind velocity	scale 1 shady	scale 1 shady	scale 1 shady	scale 1 shady
afternoon 12.00-13.00 WIB	air temperature (°c)	uncomfortable	uncomfortable	uncomfortable	uncomfortable
	humidity (%)				
	wind velocity	scale 1 shady	scale 2 weak sepoi	scale 2 weak sepoi	scale 2 weak sepoi
Late Afternoon 17.00-18.00 WIB	air temperature (°c)	uncomfortable	uncomfortable	uncomfortable	uncomfortable
	humidity (%)				
	wind velocity	scale 0 calm	scale 1 shady	scale 1 shady	scale 1 shady

Source: Piet W, 2022

Table 3. Locations 3-4 (Point 7-12) along with THI Values and Categories

Measurement Time	Measurement Time	Average Measurement Results Location 1-2 (Point 7-12)					
		T7	T8	T9	T10	T11	T12
Morning	Air temperature^{O}C	28,53	28,3	28,36	28,63	28,86	29
	Air Humidity (%)	68,33	68	71,33	66,33	66,33	64,33
Price THI		26,78	26,48	26,72	26,29	26,90	26,93
Category		Uncomfortable					
Afternoon	Air temperature^{O}C	34,2	33,16	33,43	34,16	35,53	35,9
	Air Humidity (%)	56	58	56,6	47,66	45	46
Price THI		31,19	30,16	30,52	30,57	33,40	33,89
Category		Uncomfortable					
Late	Air	27,66	27,63	27,6	27,7	27,83	27,93

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Afternoon	temperature^{O}C						
	Air Humidity (%)	73,6	73,67	72,6	75	75,3	75
Price THI		27,49	29,96	26,68	26,68	26,93	27,38
Category		Uncomfortable					

Source: Piet W, 2022

So it can be seen that the research area is included in the uncomfortable category based on the calculation of the THI formula. The uncomfortable category is in the value range of more than 26. The uncomfortable conditions (high temperature with low humidity).

Table 4. Average Wind Speed Measurement Results at Locations 1-2 (Points 1-6) and their Categories

Measurement Time	Measurement Variables	Average Measurement Results Location 1-2 (Point 1-6)					
		T1	T2	T3	T4	T5	T6
Morning	Wind Speed (m/s)	0,16	0	0,53	1,03	0,43	0,53
	Beaufort scale	0	0	1	1	1	1
Category		Calm	Calm	Shady	Shady	Shady	Shady
Midday	Air temperature^{O}C	1,5	0,2	1,03	1,76	2,73	2,4
	Air Humidity (%)	1	0	1	2	2	2
Category		Shady	Calm	Shady	Weak breeze	Weak breeze	Weak breeze
Late Afternoon	Air temperature^{O}C	0	0	0,06	0,3	1,3	1,2
	Air Humidity (%)	0	0	0	1	1	1
Category		Calm	Calm	Shady	Shady	Shady	Shady

Sumber: Piet W, 2022

Table 5. Average Wind Speed Measurement Results at Locations 3-4 (Points 7-12) and their Categories

Measurement Time	Measurement Variables	Average Measurement Results Location 1-2 (Point 7-12)					
		T7	Q8	T9	T10	T11	T12
Morning	Wind Speed (m/s)	0,43	1,26	1,86	0,36	0,3	0,36
	Beaufort scale	1	1	2	1	1	1
Category		Shady	Shady	Weak breeze	Shady	Shady	Shady
Afternoon	Air temperature^{O}C	3,36	1,43	2,2	2,6	2,2	2,73
	Air Humidity (%)	3	1	2	2	2	2
Category		Gentle	Shady	Weak	Weak	Weak	Weak

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		breeze		breeze	breeze	breeze	breeze
Late Afternoon	Air temperature^{O}C	1,06	0,56	0,63	0,16	0,2	0,5
	Air Humidity (%)	1	1	1	0	0	1
Category		Shady	Shady	Shady	Calm	Calm	Shady

Source: Piet W, 2022

The study area is dominated by wind with a shady category or a scale number of 1 based on the Beaufort Scale. This condition is due to the site having open, semi-open and closed characters and the difference in contours between several locations that affect wind direction. Wind speed ranges from a scale number of 0 to 3. The observation point with a scale number of 3 is in an open area of location 3 (Campus Forest) which is not obstructed from the direction of the wind so that the wind is quite felt.

Table 6. Land Cover and Categories

		Land Cover			Category
Location Code	Value THI Afternoon	Vegetation (Type)	Pavement Area (m²)	Building Orientation (Position)	
T1	28,41	Tree Check	1.065,3 m²	-	*Uncomfortable
T2	28,68	-	374,01 m²	The building is on the east side	*Uncomfortable
T3	28,34	Tree Check Grass	411,48 m²	The building is on the east side	*Uncomfortable
T4	28,44	Tree Grass	746,25 m²	-	*Uncomfortable
T5	28,49	-	14,705 m²	The building is on the south side	*Uncomfortable
T6	28,35	Tree	14,705 m²	The building is on the south side	*Uncomfortable
T7	28,48	Grass	-	-	*Uncomfortable
Q8	27,86	Tree Grass	-	-	*Uncomfortable
T9	27,97	Tree Grass	-	-	*Uncomfortable
T10	28	Tree Grass	375 m²	-	*Uncomfortable
T11	29	Grass	375 m²	-	*Uncomfortable
T12	29,4	Grass	375 m²	-	*Uncomfortable

*THI Comfort Standard: Comfortable 24-26, *Uncomfortable > 26*

Source: Piet W, 2022

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In locations with semi-open land cover characteristics, namely locations where there is a building orientation consisting of several locations that have an uncomfortable category, namely the FIK building area (THI 28.68) and Tennis Court (THI 28.49). While locations with closed characteristics are in the Futsal Field area (THI 28.41) and the Faculty Forest area (THI 27.6). From measuring air temperature and humidity through calculating the THI formula in the field, it is uncomfortable in the morning, afternoon and evening. This uncomfortable condition is influenced by the lack of vegetation density. This can also be influenced by the number of repetitions in measuring research variables in the field. In this case, the researcher did three repetitions for each measurement of the research variables in the morning, afternoon and evening.

Table 7. Research Findings

Measurement Time	Variable Measurement	Research result			
		Location 1 Active Area	Location 2 Semi Active Area	Location 3 Campus Forest Area	Location 4 Circulation Area
Morning (07.00-08.00)	Air temperature (°C)	uncomfortable	uncomfortable	uncomfortable	no comfortable
	Humidity (%)				
	Wind velocity	scale 1 shady	scale 1 shady	scale 1 shady	scale 1 shady
Midday (12.00-13.00)	Air temperature (°C)	uncomfortable	uncomfortable	uncomfortable	uncomfortable
	Humidity (%)				
	Wind velocity	scale 1 shady	scale 2 weak sepoi	scale 2 weak sepoi	scale 2 weak sepoi
Afternoon (17.00-18.00)	Air temperature (°C)	uncomfortable	uncomfortable	uncomfortable	uncomfortable
	Humidity (%)				
	Wind velocity	Scale 0 Calm	Scale 1 Shady	Scale 1 Shady	Scale 1 Shady

Source: Piet W, 2022

In addition to the research results table, as a whole it can be seen also from the research results plan of the distribution of thermal comfort at the research location which is shown based on the time of measurement in the field. On the map it is shown in red which indicates that all observation points are included in the uncomfortable category or have a THI index value of more than 26 as follows.

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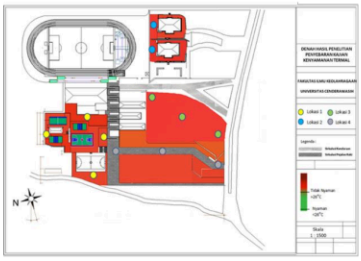

Figure 3. Map of the Research Results of the Spread of Thermal Comfort Studies at the Faculty of Sports Science, Cenderawasih University in the Morning
Source: Piet W, 2022

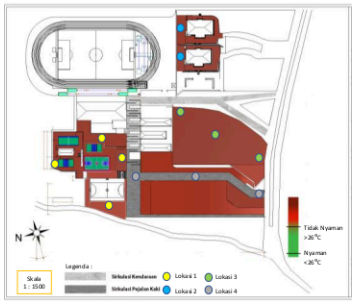

Figure 4. Schematic of the Research Results of the Spread of Thermal Comfort Studies at the Faculty of Sports Science, University of Cenderawasih during the day
Source: Piet W, 2022

Figure 5. Map of the Research Results of the Spread of Thermal Comfort Studies at the Faculty of Sports Science, Cenderawasih University in the Afternoon
Source: Piet W, 2022

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CONCLUSION

The campus of the Faculty of Sports Science has an area of 5 hectares in which there is open space. The purpose of this study is to determine the level of comfort in campus open spaces through measurements of air temperature, air humidity, and wind speed influenced by land cover (vegetation, pavement, water elements, and building orientation) in the campus environment. The theme of the study is the Comfort Zone, which focuses on user comfort to achieve the goal or criteria of thermal comfort in the environment based on the placement of space and human activities in the campus landscape. This research method uses quantitative descriptive methods. Observations were made in several locations on campus open spaces by purposive sampling on each different land cover characteristic using quantitative methods to obtain the Temperature Humidity Index (THI) value. The results showed that uncomfortable locations according to THI value standards were in all locations due to the use of pavement materials that did not absorb heat or vegetation that grew not optimally. This research shows that the presence of vegetation that shades a location can have an impact on decreasing the air temperature in that location.

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