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THE TEMPERATURE OF THE PLANET EARTH IN LATITUDE 85⁰-25⁰ DEGREES NORTH

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Abstract
In the past, hydrometeorology took into account the total thermal impact of radiation on certain geospheres. At the same time, the magnitude of this radiation flux outside the Earth was assumed to be constant.

Keywords: Hydrometeorology, solar radiation, Earth, climate, solar constant, earth's atmosphere, thermodynamics, atmosphere, absolute magnitude, cosmic rays, amplitude, latitude, correlation coefficient, mineralization.

Introduction

It is known that according to Stefan-Boltzmann's law, the oscillations of the solar constant with an amplitude of 1% of its magnitude (if the incoming and outgoing energies are equal) cause a change in temperature (temperature deviation) of 0.7°C on the entire surface of the earth, the areas of the earth's surface are given in Table 1.

Table 1 The water balance of the earth according to long-term average annual data (according to various authors). M. Budiko, p. 275. V. Larcher. Translation from German c.b.n. Viktorova D.P.

Region	Surface, 10^6, км^2	% from the square	Water volume t.10^{12}	%
The whole globe	510,0		+496,1	
Dry	148,9	29,196	+111,1	22,39
Northern Hemisphere	100,3	19,666	+68,0	13,70
Southern Hemisphere	48,6	9,529	+43,1	8,68
World Ocean	361,1	70,804	+3850	77,61
Northern Hemisphere	154,7	30,333	+179,3	36,14

Thus, it is quite possible that due to changes in insulation as a function of geographical latitude and differences in the heat capacity of the surface of land and sea, changes in temperature under the influence of 1% of insulation will be significantly greater than 0.7 °C in some regions of the earth. For example, from M.S. Eygenson's book [6], the relationship between ocean water temperature in the 0–50-meter layer and the average maximum area of one group of sunspots Sm over 11 years of solar cycle, according to N.I. Tyubin, the Nordkop flow in the section of the Kola meridian for 1900-1950 years have a close relationship, the correlation coefficient is 0.98 Figure 1.

$$T=0{,}074\ S_m+3{,}54 \qquad (1)$$

Где: T – the temperature of the ocean water in the layer from 0.050 m solar cycle;

0,074 and 3,54 constant members of the correlation equation;

S_m – the average area of the spots and the visible side of the Sun over the 11-year cycle.

Research results: We propose using the average solar radiation power for 11 years in place of S_m.

$$t_{ocean\ water} = 0{,}96483\ P - 1312{,}2741 \pm 0{,}84\ ^0C \qquad (2)$$

Where: P – average solar radiation power per cycle;

0,96483 and 1312, 2741 constant members of the correlation equation;

0,84 ^{0}C – the confidence interval is the temperature of the ocean water. The correlation coefficient is R = 0.889.

The dependence of the temperature of the ocean water on the Kol meridian and the Nardkop flow is given in Table 2.

Table 2 Solar-earth correlations of ocean temperature in the 0.0-50-meter layer, across the Kola meridian.

Cycle number	Cycle period	Solar radiation power W, m^2/sec	The average temperature of the ocean water in the 0-50m layer. Cross-section of the annular meridian t̊ S
1	2	3	4
13	1890-1901	1364,4	4,97
14	1902-1913	1364,0	4,95
15	1914-1923	1364,8	5,12
16	1924-1933	1364,6	4,49
17	1934-1944	1365,1	4,06
18	1945-1954	1365,0	4,11
19	1955-1964	1365,0	3,89
20	1965-1976	1365,7	4,59
21	1977-1986	1364,8	4,48
22	1987-1996	1364,9	5,08
23	1997-2008	1364,9	4,83
24	2009-2018	1364,7	4,85

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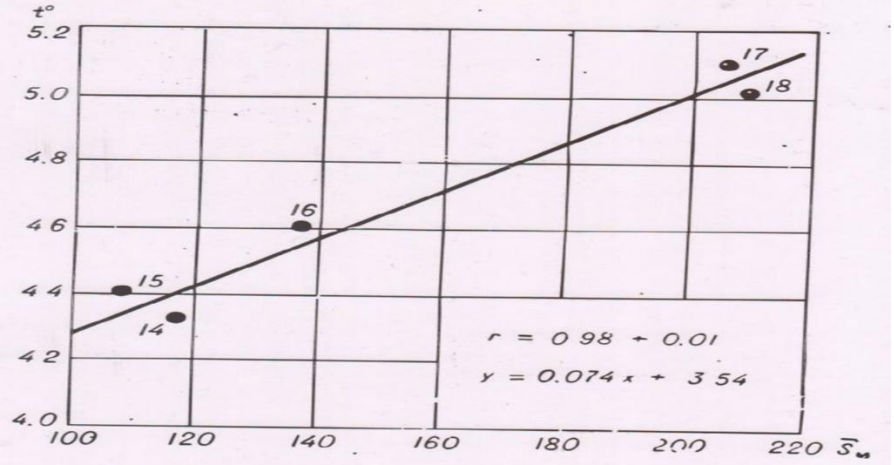

Figure 1. The relationship between ocean water temperature in the 0-50 m layer of S_m, according to N.I. Tyubin.

The average temperature of the terrestrial air in the Northern Hemisphere.

The Earth is interconnected with the oceans.

The relationship equation is given by formulas (3) and (4)

$t_{air} = 13,88 – 0,66\ t_{ocean}$; R = - 0,97 (3)

$t_{air} = 12,93 – 0,53\ t_{ocean}$; R = - 0,87 (4)

Table 3 The average temperature of the terrestrial air in the northern hemisphere of the planet Earth over the period of instrumental observations (t,^{0}S) over the solar cycle.

№	period years		Average solar radiation power P, W, m^2/sec	The average temperature of ocean water in the 0-50m layer over eleven summer cycles of the sun	Air temperature in the northern hemisphere of the planet Earth Calculation equations		Average statistical ground temperature	Deviation from the mean t' S		Deviation from the average power of solar radiation, stain variability
	beginning	end			$t_{air} = 13,88 – 0,66t_{ocean}$; R= -0,97	t_{air} =12,93 – 0,53 t_{ocean}; R = - 0,8		Ocean temperature	Ground air	
1	2	3	4	5	6	7	8	9	10	11
1	1700	1712	1362,73	1,99	12,56	11,87	12,21	-2,276	1,47	-1,9634
2	1713	1723	1364,15	3,69	11,44	10,96	11,20	-0,567	0,46	-0,5434
3	1724	1733	1365,08	4,83	10,68	10,35	10,51	0,564	-0,23	0,3866
4	1734	1744	1365,07	4,82	10,69	10,35	10,52	0,554	-0,22	0,3766
5	1745	1756	1364,5	4,22	11,09	10,68	10,88	-0,046	0,14	-0,1934
6	1757	1766	1365,34	5,22	10,42	10,14	10,28	0,954	-0,46	0,6466
7	1767	1775	1365,65	5,58	10,18	9,95	10,06	1,314	-0,68	0,9566
8	1776	1784	1365,15	4,98	10,58	10,27	10,42	0,714	-0,32	0,4566
9	1785	1798	1365,02	4,85	10,67	10,34	10,50	0,584	-0,24	0,3266
10	1799	1810	13653,37	2,83	12,01	11,42	11,71	-1,436	0,97	-1,3234
11	1811	1823	1362,9	2,23	12,40	11,74	12,07	-2,036	1,33	-1,7934
12	1824	1833	1364,8	4,53	10,88	10,57	10,72	0,264	-0,02	0,1066
13	1834	1843	1365,15	4,98	10,58	10,27	10,42	0,714	-0,32	0,4566
14	1844	1856	1365,1	4,93	10,61	10,30	10,45	0,664	-0,29	0,4066
15	1857	1867	1365,2	5,13	10,48	10,19	10,33	0,864	-0,41	0,5066
16	1868	1878	1364,5	4,49	10,91	10,53	10,72	0,224	-0,02	-0,1934
17	1879	1889	1364,3	4,06	11,19	10,76	10,97	-0,206	0,23	-0,3934
18	1890	1901	1364,4	4,12	11,15	10,73	10,94	-0,146	0,2	-0,2934
19	1902	1913	1364,0	3,59	11,50	11,01	11,25	-0,676	0,51	-0,6934
20	1914	1923	1364,8	4,59	10,84	10,48	10,66	0,324	-0,08	0,1066
21	1924	1933	1364,6	4,48	10,91	10,54	10,57	0,214	-0,17	-0,0934
22	1934	1944	1365,1	5,02	10,56	10,25	10,40	0,754	-0,34	0,4066
23	1945	1954	1365,0	4,85	10,67	10,34	10,50	0,584	-0,24	0,3066
24	1955	1964	1365,0	4,89	10,64	10,32	10,48	0,624	-0,26	0,3066
25	1965	1976	1365,7	5,43	10,28	10,03	10,15	1,164	-0,59	1,0066
26	1977	1986	1364,8	4,81	10,69	10,36	10,52	0,544	-0,22	0,1066
27	1987	1996	1364,9	4,53	10,88	10,51	10,69	0,264	-0,05	0,2066
28	1997	2008	1364,9	4,46	10,81	10,45	10,63	0,374	-0,11	0,2060
29	2009	2018	1364,9	4,35	11,0	10,64	10,80	0,084	0,06	0,2066
Average			1364,693	4,43			10,74			

Average power P=1364,6934; Average air temperature 10,74 ^{0}S

Table 3 The variability of the temperature regime of the planet Earth, in the hydrological year

Solar radiation power W, m^2/sec	Ocean temperature t˚S	Hydrological year	
		Winter	summer
1	2	3	4
1360	0,86	3,03	16,96
1361	1,33	3,12	16,90
1362	1,82	3,31	16,84
1363	2,81	3,49	16,78
1364	3,89	3,69	16,71
1365	4,72	3,90	16,64
1366	5,68	4,09	16,57
1367	6,65	4,29	16,51

The dependence of ground air on solar radiation power

$$t^{air}_{85^0-25^0} = 963{,}5136 - 6{,}98\ P\ \mp 0{,}76\ ^0S \qquad (5)$$

Where: $t^{air}_{85^0-25^0}$ - average temperature at 85^0-25^0 latitude;

963.5136 and 6.98 constant members;

R - solar radiation power, W.m^2/sec behind the ionosphere.

Conclusions

The change in climatic indicators can be explained as follows. As can be seen from the table, as the power of solar energy increases, the temperature of the ocean increases, this phenomenon not only leads to an increase in the temperature of the sea and the surface of the ocean, but also the absorption of carbon dioxide by the ocean becomes ineffective, resulting in a large amount of greenhouse gases entering the atmosphere. As a result of these events, the winter temperature in the hydrological year increases, and the summer temperature decreases. In conclusion, it can be said that the energy of the Sun is the cause of all events on Earth and controls every change.

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