Global Journal of Science Frontier Research: B
Chemistry
Volume 14 Issue 6 Version 1.0 Year 2014
Type : Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals Inc. (USA)
Online ISSN: 2249-4626 & Print ISSN: 0975-5896

Physico-Chemical Analysis for the Presence of Oxygen Content of Ground Water at Different Locations of Dildar Nagar of U.P, India

By Salahuddin & R. K. Khola
Mewar University, India

Abstract- In this paper, we discuss about the recently collected sample of ground water at different locations in Uttar Pradesh State of India and its experimental analysis in laboratory for the presence of Oxygen content. Also, we represents the data graphically and interpreted the data using the method called analysis of variance. Further, we analyze our findings with the established results. Lastly we concluded that the samples depend on location as well as month also that is in different months and different areas disolved Oxygen are different.

Keywords: *ground water; analysis of variance; graphical representation.*

GJSFR-B Classification : *FOR Code: 62J10,62H86,62P12.*

PHYSICOCHEMICALANALYSISFORTHEPRESENCEOFOXYGENCONTENTOFGROUNDWATERATDIFFERENTLOCATIONSOFDILDARNAGARDFUPINDIA

Strictly as per the compliance and regulations of :

Physico-Chemical Analysis for the Presence of Oxygen Content of Ground Water at Different Locations of Dildar Nagar of U.P, India

Salahuddin [α] & R. K. Khola [σ]

Abstract- In this paper, we discuss about the recently collected sample of ground water at different locations in Uttar Pradesh State of India and its experimental analysis in laboratory for the presence of Oxygen content. Also, we represents the data graphically and interpreted the data using the method called analysis of variance. Further, we analyze our findings with the established results. Lastly we concluded that the samples depend on location as well as month also that is in different months and different areas disolved Oxygen are different.

Keywords: ground water; analysis of variance; graphical representation.

2010 MSC NO: 62J10,62H86,62P12.

I. Introduction

Groundwater is the water located beneath the earth's surface in soil pore spaces and in the fractures of rock formations. A unit of rock or an unconsolidated deposit is called an aquifer when it can yield a usable quantity of water. The depth at which soil pore spaces or fractures and voids in rock become completely saturated with water is called the water table. Groundwater is recharged from, and eventually flows to, the surface naturally; natural discharge often occurs at springs and seeps, and can form oases or wetlands. Groundwater is also often withdrawn for agricultural, municipal, and industrial use by constructing and operating extraction wells. The study of the distribution and movement of groundwater is hydrogeology, also called groundwater hydrology.

a) Dissolved Oxygen

The DO is Required by higher forms of aquatic life for survival. The DO standards were formulated considering fisheries criteria. The national comnuittee on water pollution control resources established guidelines in 1958 for water use DO. Relatively good water bodies have more than 7.5 mg/l. For fisheries, hatching of salmon and trout rearing, more than 7 mg/l DO is required. Other general aquatic organisms also require more than 6 mg/l. In Ohio State, USA, the DO standard for fisheries is 5 mg/l. The Japanese standard for class 3 fisheries is established at the same level. Dissolved oxygen should be more than 5 mg/l for agriculture use, because DO less than 5 mg/l interferes with root growth. The DO level for the conservation of the environment should be kept at more than 2 mg/l to prevent anaerobic conditions that cause bad odors.

b) Anova

It is a statistical tool used in several ways to develop and confirm an explanation for the observed data. It is an extension of the t-test, which is used in determining the nonsignificance of difference of three or more group of values.

The calculations of ANOVA can be characterized as computing a number of means and variances, dividing two variances and comparing the ratio to a handbook value to determine statistical significance.

The F-test is used for comparisons of the components of the total deviation. For example, in one-way or single factor ANOVA, statistical significance is tested for by comparing the F test statistic

F=Variance between samples/ Variance within samples.

The textbook method of concluding the hypothesis test is to compare the observed value of F with the critical value of F determined from tables. The critical value of F is a function of the numerator degrees of freedom, the denominator degrees of freedom and the significance level (α). If F FCritical (Numerator DF, Denominator DF,α) then reject the null hypothesis.

c) Sample Collection

The samples of ground water are collected from various areas near to Dildar Nagar in Uttar Pradesh state. Samples are collected in plastic container to avoid unpredictable changes.

d) Physico-Chemical Analysis Of Ground Water

The collected samples were analyzed for disolved Oxygen which are collected from different areas and different months near to Dildar Nagar.

II. Results and Discussion

The water quality analysis of different locations of ground water samples have been carried out for disolved oxygen. The status of water quality of ground water sources for dissolved Oxygen are presented in Table 1 and represented graphically in Fig 1.

Author α σ: Mewar University, Gangrar, Chittorgarh (Rajasthan), India.
e-mails: vsludn@gmail.com, sludn@yahoo.com

The disolved Oxygen in various areas according to various months are different which is estabished by statistical analysis.

Table 1 : Monthly variation in Dissolved Oxygen (mg/l) of ground water at different sampling sites

CODE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
GW1	5.1	5.2	6.5	6.2	5.7	5.5	5	4.9	4.5	5.6	5.7	5.3
GW2	5.3	5.5	5.6	5.4	5.6	5.1	4.9	4.3	4.2	5.1	5.2	5.2
GW3	5.4	4.8	4.7	4.5	5.3	4.4	3.8	3.8	3.3	3.1	3.2	3.9
GW4	5.9	6	6.1	6.3	6.1	5.6	5.2	5.1	5.2	5.6	5.6	5.7
GW5	5.1	5.2	5.1	5.4	5.7	5.7	5.4	4.8	4.9	5.1	5.2	5.2
GW6	5.7	5.2	5.1	5.4	5.3	5.4	4.9	4.7	4.1	4.2	4.9	4.8
GW7	5.2	5.1	5	5.6	5.7	5.6	5	5.2	5.5	5.6	5.4	5.6
GW8	5.1	5.2	5.7	5.7	5.8	5.7	6.3	6.2	5.6	6.1	6.1	6.4
GW9	5.1	5.4	5.7	6.2	6.1	6.1	5.6	5.9	6.2	5.5	6.1	5.8
GW10	6.2	6.1	6.7	6.1	6.2	6.2	5.2	5.4	5.4	5.8	6	5.2

GW1= Yuduf Pur, GW2 = Dildar Nagar, GW3 = Saidpur, GW4 = Nandganj Railway Station, GW5 = Attarsua Village, GW6 = Reonsa village, GW7 = Dhamupur, GW8 = Saheri village,GW9 = Kusmhi Kala village, GW10 = Husainpur village

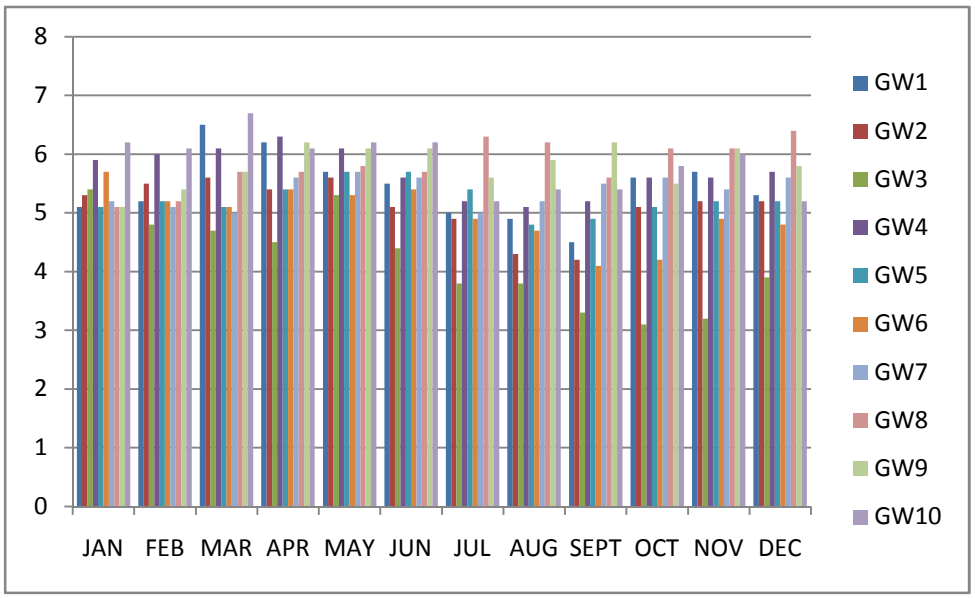

Fig. 1 : Graphical representation of the data

a) Analysis the Data using two way Anova

Sum of squares between areas= 7.74625

Sum of squares between months = 28.93342

Sources of value	Sum of squares	Degrees of freedom	Mean square(variance)
Between Area	7.74625	11	0.704205
Between month	28.93342	9	3.214824
Residual	16.35958	99	0.165248
Total	53.03925	119	

Let us take the Hypothesis that there is no signaficance difference of Oxygen content between the areas and months.

First we compare the variance of areas with the variance of residual.

$F_1 = 4.261493$.

The table value of F_1 for $\upsilon_1=11$ and $\upsilon_2=99$ at 5% level of significance is 1.886684.

The calculated value is greater than table value and we conclude that the Oxygen content of different areas are not same that is Oxygen content of different areas are different.

Now , let us compare the variance according to months with the variance of residuals.

$F_2= 19.4545$.

The table value of F_2 for $\upsilon_3=9$ and $\upsilon_2=99$ at 5% level of significance is 1.975806.

The calculated value is greater than table value and we conclude that Oxygen content of different areas changes according to months. That is Oxygen content depends on months.That is Oxygen content in different month is different.

III. Conclusion

It is concluded that the Oxygen content of ground water depends on locations as well as months. In Saidpur it is not suitable for agriculture use except the month of January because DO less than 5 mg/l interferes with root growth.

References Références Referencias

1. Andrew Gelman, Analysis of variance? Why it is more important than ever, *The Annals of Statistics* 33: 1–53, 2005.
2. David A Freedman, *Statistical Models: Theory and Practice,* Cambridge University Press, 2005.
3. D. R. Cox, Principles *of statistical inference.* Cambridge New York: Cambridge University Press, 2006.
4. F. J. Anscombe, The Validity of Comparative Experiments, *Journal of the Royal Statistical Society. Series* A (General), 181–211, 1948.
5. Gerald Van Belle, *Statistical rules of thumb* (2nd ed.). Hoboken, N.J: Wiley, 2008.
6. Henry Scheffé, *The Analysis of Variance.* New York: Wiley, 1959.
7. P.N. Patil, D.V. Samant and R.N. Deshmukh, Physico-chemical parameters for testing ofwater – A review, International Journal of Environmental Sciences, 3(3),1194-1207, 2012.
8. Emecs(2014, October), Environmental Quality Standards for Water Pollutants. Retrived website: http://www.emecs.or.jp/01cd rom/section_3_e/sec3-_a_ro_b_6_e.html

This page is intentionally left blank