DAFTAR PUSTAKA

Anliker, R., (1977). *Colour chemistry and environment. Color. Technol*. 8, 60-72. doi : https://doi.org/10.1111/j.1478-4408.1977.tb03808.x.

Awoke Guadie, Amare Gessesse, Siqing Xia. (2018). *Halomonas sp. strain A55, a novel dye decolorizing bacterium from dye-uncontaminated Rift Valley Soda Lake*. *Chemosphere* 206 (2018) 59e69. doi: https://doi.org/10.1016/j.chemosphere.2018.04.134.

Azanaw, et al., (2022). *Textile effluent treatment methods and eco-friendly resolution of textile wastewater*. *Case Studies in Chemical and Environmental Engineering*. Vol. 6, December 2022. 100230. Doi : https://doi.org/10.1016/j.cscee.2022.100230

Badan Standardisasi Nasional, (2008). SNI 6989.57-2008 tentang Air dan Limbah Bagian 57 : Metode Pengambilan Contoh Air Permukaan. Jakarta.

Badan Standardisasi Nasional, (2019). SNI 6989.3-2019 tentang Air dan Limbah Bagian 3 : Cara Uji Padatan Tersuspensi Total (Total Suspended Solids/TSS) secara Gravimetri. Jakarta.

Badan Standardisasi Nasional, (2019). SNI 6989.11-2019 tentang Air dan Limbah Bagian 11 : Cara Uji Derajat Keasaman dengan Menggunakan pH Meter. Jakarta.

Badan Standardisasi Nasional, (2009). SNI 6989.72-2009 tentang Air dan Limbah Bagian 72 : Cara Uji Oksigen Biokima (Biochemical Oxygen Demand / BOD). Jakarta.

Badan Standardisasi Nasional, (2009). SNI 6989.73-2009 tentang Air dan Limbah Bagian 73 : Cara Uji Kebutuhan Oksigen Kimiawi (Chemical Oxygen Demand / COD) dengan Refluks Tertutup Secara Titrimetri. Jakarta.

Badan Standardisasi Nasional, (2004). SNI 06-6989.17-2004 tentang Air dan Limbah Bagian 17 : Cara Uji Krom Total (Cr-T) dengan metode Spektrofotometri Serapan Atom (SSA) - nyala. Jakarta.

Badan Standardisasi Nasional, (2004). SNI 06-6989.21-2004 tentang Air dan Limbah Bagian 21 : Cara Uji Kadar Fenol Secara Spektrofotometri. Jakarta.

Badan Pusat Statistik. (2021). Kabupaten Wajo dalam Angka Tahun 2021. Badan Pusat Statistik Kabupaten Wajo : Wajo.

Badan Pusat Statistik. (2021). Kecamatan Tansitolo dalam Angka Tahun 2021. Badan Pusat Statistik Kabupaten Wajo : Wajo.

Beenish Saba, Birthe V. Kjellerup, Ann D. Christy. (2021). *Eco-friendly bio-electro-degradation of textile dyes wastewater. Bioresource Technology Reports* 15 (2021) 100734. doi : https://doi.org/10.1016/j.biteb.2021.100734.

DH Putri., dkk. (2014). Sebaran Kandungan Bahan Organik Total di Perairan Muara Sungai Porong Kabupaten Sidoarjo. Jurnal Oseanografi. Volume : 3, Nomor 4, 2014. Halaman 610-617. Semarang.

Dinas Lingkungan Hidup Kabupaten Wajo. (2020). Laporan Pemantauan Kualitas Air Kabupaten Wajo Tahun 2020. Wajo.

Dinas Lingkungan Hidup Kabupaten Wajo. (2021). Laporan Pemantauan Kualitas Air Kabupaten Wajo Tahun 2021. Wajo.

Dinas Lingkungan Hidup Kabupaten Wajo. (2022). Laporan Pemantauan Kualitas Air Kabupaten Wajo Tahun 2022. Wajo

Dinas Perindustrian, Perdagangan, Koperasi dan Usaha Kecil Menengah Kabupaten Wajo. (2020). Data Industri Kecil Menengah Kabupaten Wajo Tahun 2020. Wajo

Drs. Dede Sugandi, M.Si., Lili Sumantri, S.Pd., M.Si., Nanin Trianawati Sugito, S.T., M.T., (2009). Hand Out Sistem Informasi Geografi (SIG). Jurusan Pendidikan Geografi Fakultas Pendidikan Ilmu Pengetahuan Sosial Universitas Pendidikan Indonesia. Bandung.

Eko, Harsono, dkk. (2000). Estimasi Pola Arus Danau Ranau. Technical Report. Puslitbang Limnologi LIPI. Jakarta

Fitinline. Jenis-jenis bahan pewarna dan pemanfaatannyadalam industri tekstil. 9 Juli 2019. https://www.https://fitinline.com/article/read/jenis-jenis-bahan-pewarna-dan-pemanfaatannya-dalam-industri-tekstil/

Ghaly, A.E., Ananthashankar, R., Alhattab, M.V.V.R., Ramakrishnan, V.V., 2014. *Production, characterization and treatment of textile effluents: a critical review. J. Chem. Eng. Process Technol*., 5 (1) (2014), pp. 1-19. Doi : http://dx.doi.org/10.4172/2157-7048.1000182

Haryono., Muhammad Faizal D., Christi Liamita N., Atiek Rosida., (2018). Pengolahan Limbah Zat Warna Tekstil Terdispersi dengan Metode Elektroflotasi. Departemen Kimia. Fakultas Matematika dan Ilmu Pengetahuan Alam. Universitas Padjajaran. Bandung.

Houda Ben Slama, Ali Chenari Bouket, Zeinab Pourhassan, Faizah N. Alenezi, Allaoua Silini, et al. (2021). *Diversity of Synthetic Dyes from Textile Industries, Discharge Impacts and Treatment Methods*. Appl. Sci. 2021, 11, 6255. doi : https://doi.org/10.3390/app11146255.

Hiba Bensalah, Maged F. Bekheet, Saad Alami Younssi, Mohamed Ouammou, Aleksander Gurlo. (2017). *Removal of cationic and anionic textile dyes with Moroccan natural phosphate. Journal of Environmental Chemical Engineering* 5 (2017) 2189–2199. doi : https://doi.org/10.1016/j.jece.2017.04.021.

Indonesia. (2009). Undang – undang Nomor 32 Tahun 2009 tentang Perlindungan dan Pengelolaan Lingkungan Hidup. Jakarta.

Indonesia. (2021). Peraturan Pemerintah Nomor 22 Tahun 2021 tentang Penyelenggaraan Perlindungan dan Pengelolaan Lingkungan Hidup. Jakarta.

Indonesia. (2021). Peraturan Presiten Republik Indonesia Nomor 60 Tahun 2021. Penyelamatan Danau Prioritas Nasional. 22 Juni 2021. Lembaran Negara Republik Indonesia Tahun 2021 Nomor 143, Jakarta. Pasal 3 Ayat 1.

Yuda Kamajaya, Gede, dkk. (2021). Analisis Sebaran Total Suspended Solid (TSS) Berdasarkan Citra Landsat 8 Menggunakan Tiga Algoritma Berbeda Di Perairan Teluk Benoa, Bali. Journal of Marine and Aquatic Sciences 7(1), 18-24 (2021). doi: https://doi.org/10.24843/jmas.2021.v07.i01.p03.

Kementerian Lingkungan Hidup, (2014). Peraturan Menteri Lingkungan Hidup Nomor 5 Tahun 2014 tentang Baku Mutu Air Limbah, 15 Oktober 2014. Berita Negara Republik Indonesia Tahun 2014 Nomor 1815. Jakarta.

Kecamatan Tanasitolo. (2021). Profil dan Tipologi Pemerintah Kecamatan Tanasitolo Tahun 2021. Pemerintah Kecamatan Tanasitolo : Tanasitolo.

Kishore Chand, Dianxue Cao, Diaa Eldin Fouad, Ahmer Hussain Shah, Abdul Qadeer Dayo, Kai Zhu, et al. (2020). *Green synthesis, characterization and photocatalytic application of silver nanoparticles synthesized by various plant extracts. Arabian Journal of Chemistry* (2020) 13, 8248–8261. doi : https://doi.org/10.1016/j.arabjc.2020.01.009.

Kurnianti, dkk. (2020). Analisis Beban Dan Status Pencemaran Bod Dan Cod Di Kali Asin, Semarang. Journal of Fisheries and Marine Research Vol. 4 No. 3 (2020) 379-388.

Laila Hossain, Sumit Kanti Sarker, Mohidus Samad Khan. (2018). *Evaluation of present and future wastewater impacts of textile dyeing industries in*

Bangladesh. *Environmental Development*. Volume 26, June 2018, 23-33. doi : https://doi.org/10.1016/j.envdev.2018.03.005.

Murai, S, (1999), *GIS Work Book, Institute of Industrial Science, University of Tokyo*, 7-22-1 Roppongi, Minatoku, Tokyo.

Mohamed Berradi, Rachid Hsissou, Mohammed Khudhair, Mohammed Assouag, Omar Cherkaoui, Abderrahim El Bachiri, et al. (2019). *Textile finishing dyes and their impact on aquatic environs. Heliyon 5* (2019) e02711. doi : https://doi.org/10.1016/j.heliyon.2019.e02711.

Prasetia, Angga dan Walukow, Auldry. F., (2021). Analisis mutu air Danau Area Gelanggang Expo dengan metode indeks pencemaran di kota Jayapura. Dinamika Lingkungan Indonesia, Januari 2021. Volume 8. Nomor 1. P. 42-47. Jayapura. Doi : 10.31258/dli.8.1.p.42-47

Priya. E. Sanmuga and Selvan. P. Senthamil. (2014). Water hyacinth (Eichhornia crassipes) – *An efficient and economic adsorbent for textile effluent treatment – A review. Arabian Journal of Chemistry*. Doi : https://doi.org/10.1016/j.arabjc.2014.03.002

Propinsi Sulawesi Selatan. (2010). Peraturan Gubernur Sulawesi Selatan Nomor 69 Tahun 2010 tentang Baku Mutu dan Kriteria Kerusakan Lingkungan Hidup. Makassar.

Rosyida, A. dan Zulfiya, A., (2013). Pewarnaan bahan tekstil dengan menggunakan ekstrak kayu Nangka dan Teknik pewarnaannya untuk mendapatkan hasil optimal. Jurnal Rekayasa Proses, 7(2), 52-58.

Saba, et al. (2021). *Eco-friendly bio-electro-degradation of textile dyes wastewater. Bioresource Technology Reports 15* (2021) 100734. doi : https://doi.org/10.1016/j.biteb.2021.100734

Shashi Prabha, et al. (2017). Assessment of the impact of textile effluents on microbial diversityin Tirupur district, Tamil Nadu. Appl Water Sci (2017) 7:2267–2277. DOI 10.1007/s13201-016-0394-3

Saraswati, Yustiara Widya, dkk., (2014). Sebaean Spasial dan Temporal Fenol, Kromiumium dan Minyak di Sekitar Sentra Industri Batik Kabupaten Pekalongan. Diponegoro Journal Of Maquares Volume 3, Nomor 1, Tahun 2014, Halaman 186-192. Semarang.

Satya, Venti Eka. Suhartono, dkk. (2017). Pengembangan Industri Tekstil Nasional : Kebijakan Inovasi dan Pengelolaan Menuju Peningkatan Daya Saing. Yayasan Pustaka Obor Indonesia, 2017), APU-Ed. I: Cetakan 1. Jakarta.

Setyaningtyas, dkk. (2018). Degradasi Fenol pada Limbah Cair Batik Menggunakan Reagen Fenton Dengan Sinar UV. Jurnal Kimia VALENSI, Vol. 4, No. 1, Mei 2018 [26-33].

Swapnil M. Patil, Mangesh V. Suryavanshi, Vishal V. Chandanshive, Mayur B. Kurade, Sanjay P. Govindwar, Byong-Hun Jeon. (2019). *Regeneration of textile wastewater deteriorated microbial diversity of soil microcosm through bioaugmentation. Chemical Engineering Journal 380 (2020)* 122533. doi : https://doi.org/10.1016/j.cej.2019.122533.

Sughosh Madhav, Arif Ahamad, Pardeep Singh, Pradeep Kumar Mishra. (2018). *A Review Of Textile Industri: Wet Processing, Environmental Impacts, And Effluent Treatment Methods. Environmental Quality Management*. Volume 27, Issue 3, 31-41. doi : https://doi.org/10.1002/tqem.21538.

Yiqian Yuan, Xun-an Ning, Yaping Zhang, Xiaojun Lai, Danping L, Zili Dia, Xiaohui Chen. (2020). *Chlorobenzene levels, component distribution, and ambient severity in wastewater from five textile dyeing wastewater treatment plants. Ecotoxicology and Environmental Safety 193 (2020)* 110257. doi : https://doi.org/10.1016/j.ecoenv.2020.110257.

Yusuf, Muri. (2017). Metode Penelitian Kuantitatif, Kualitatif dan Penelitian Gabungan. Kencana. Jakarta

LAMPIRAN

Lampiran 1. Metode Perhitungan Indeks Pencemaran

Penentuan status mutu air dengan metode Indeks Pencemaran mengacu pada Peraturan Gubernur Sulawesi Selatan No. 69 Tahun 2010 tentang Baku Mutu dan Kriteria Kerusakan Lingkungan Hidup Lampiran I Huruf B Metode Penentuan Status Mutu Air dapat dilakukan dengan cara, yaitu :

1. Mengumpulkan data parameter pencemar hasil pengujian laboratorium.
2. Penentuan nilai baku mutu (LiX)
3. Perhitungan nilai (Ci / LiX).
4. Perhitungan nilai (Ci / LiX Baru).
   - Jika nilai (Ci / LiX) di bawah dari 1,0, maka nilai yang dimasukkan ke dalam (Ci / LiX Baru) adalah nilai (Ci / LiX).
     (Ci / LiX Baru) < 1,0
     (Ci / LiX Baru) = (Ci / Li)
   - Jika nilai (Ci / LiX) di atas dari 1,0, maka di gunakan rumus :
     (Ci / LiX Baru) > 1,0
     (Ci / LiX Baru) = 1,0 + P.log(Ci/Lij)
     = 1,0 + 5 (Ci/Lij)
     P adalah konstanta dan nilainya ditentukan dengan bebas dan disesuaikan dengan hasil pengamatan lingkungan dan atau persyaratan yang dikehendaki untuk suatu peruntukan (biasanya digunakan nilai 5).
5. Nilai dari Indeks Pencemaran Ididapatkan dengan rumus :

$$PIj = \sqrt{\frac{(Ci / LiX\ Baru)^2 M + (Ci / LiX\ Baru)^2 R}{2}}$$

Dimana :
PIj = Indeks Pencemaran
Ci = Nilai Parameter
LiX = Nilai Baku Mutu
R = Nilai Rata - rata
M = Nilai Maksimum

a. Zat padat tersuspensi / *Total Suspended Solid* (TSS)
   Ci = 15,750
   LiX = 80
   Ci / LiX = 15,750 / 80
   = 0,197
   Ci / LiX Baru = Ci / LiX
   = 0,197

b. *Biochemical Oxygen Demand* (BOD)
   Ci = 25,253
   LiX = 2
   Ci / LiX = 25,253 / 2
   = 12,626

Ci / LiX Baru = 1,0 + P.log(Ci/LiX)
= 1,0 + 5 (12,626)
= 6,506

c. *Chemical Oxygen Demand* (COD)
Ci = 45,807
LiX = 10
Ci / LiX = 45,807 / 10
= 4,581
Ci / LiX Baru = 1,0 + P.log(Ci/LiX)
= 1,0 + 5 (4,581)
= 4,305

d. Fenol
Ci = 0,015
LiX = 0,002
Ci / LiX = 0,015 / 0,002
= 7,656
Ci / LiX Baru = 1,0 + P.log(Ci/LiX)
= 1,0 + 5 (7,656)
= 5,420

Untuk menentukan nilai Indeks Pencemaran, maka perhitungannya sebagai berikut :

R = Nilai Rata - rata Ci / LiX Baru Parameter
= 4,107
M = Nilai Maksimum Ci / LiX Baru Parameter
= 6,506

Rumus :

$$PIj = \sqrt{\frac{(Ci / LiX\ Baru)^2 M + (Ci / LiX\ Baru)^2 R}{2}}$$

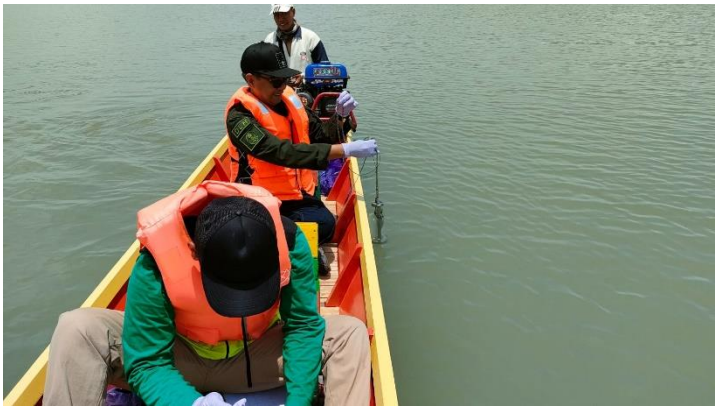
$$= \sqrt{\frac{6{,}506^2 + 4{,}107^2}{2}}$$

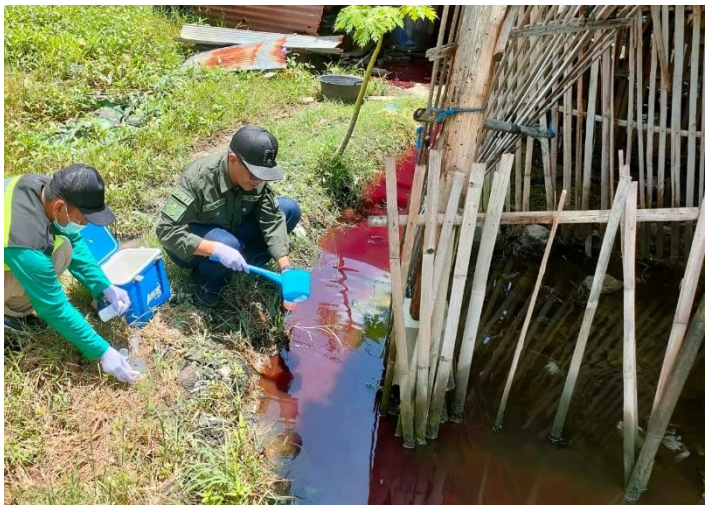
= **5,441**

Berdasarkan hasil perhitungan Indeks Pencemaran di Danau Tempe didapatkan nilai **5,441** dengan status mutu air **Cemar Sedang.** Sesuai dengan nilai evaluasi indeks pencemaran yang ada di Peraturan Gubernur Sulawesi Selatan No. 69 Tahun 2010 tentang Baku Mutu dan Kriteria Kerusakan Lingkungan Hidup Lampiran I Huruf B Metode Penentuan Status Mutu Air, yaitu

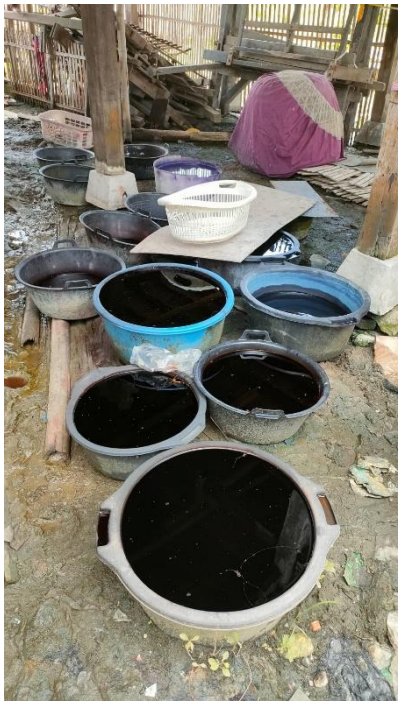
1) $0 \leq PIj \leq 1{,}0$ Memenuhi baku mutu
2) $1{,}0 < PIj \leq 5{,}0$ Cemar ringan
3) $5{,}0 < PIj \leq 10{,}0$ Cemar sedang
4) $PIj > 10{,}0$ Cemar berat

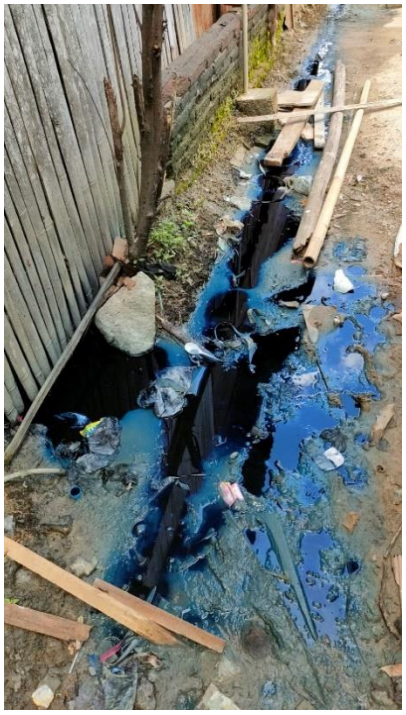
Lampiran 2. Foto Pengambilan Sampel Kualitas Air di Danau Tempe dan Industri Sutera

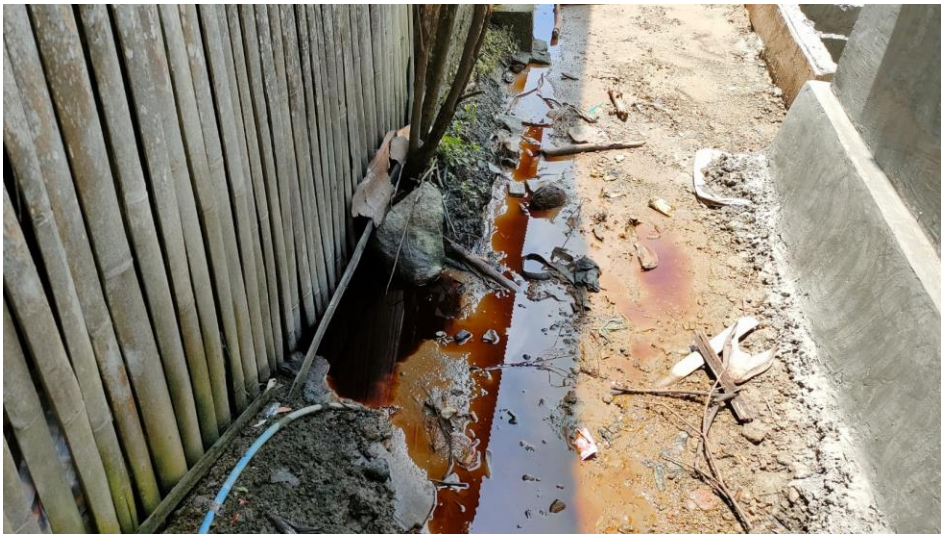




Lampiran 3. Foto Limbah Cair Industri Sutera







Lampiran 4. Pengolahan Data Peta Interpolasi Analisis Kandungan Parameter Kualitas Air di Danau Tempe

a. TSS

Kriging
==========
Parameters

Input point features Titik_Sampling
Z value field TSS
Output surface raster C:\Users\ASUS\Documents\ArieRafi\All GIS Project\Analisia Kualitas Air Tempe\Digitasi Modeling\tss_kriging5
Semivariogram properties Gaussian 0.000162 # # #
Output cell size 5.58453868802189E-04
Search radius VARIABLE 12
Output variance of prediction raster
==========
Environments
Extent 119.895138684 -4.18208783999995 120.034752151201 -4.03591049457179
GEOGCS["GCS_WGS_1984",DATUM["D_WGS_1984",SPHEROID["WGS_1984",6378137.0,298.257223563]],PRIMEM["Greenwich",0.0],UNIT["Degree",0.0174532925199433]]
Mask Danau
==========
Messages
Start Time: 16 March 2023 23:08:24
GAUSSIAN
Lag size = 0.000162
Partial sill = 0.010000
Nugget = 16978.051994
Major range = 0.094279
Succeeded at 16 March 2023 23:08:24 (Elapsed Time: 0.64 seconds)

b. BOD

Kriging
==========
Parameters
Input point features Titik_Sampling
Z value field BOD
Output surface raster C:\Users\ASUS\Documents\ArieRafi\All GIS Project\Analisia Kualitas Air Tempe\Digitasi Modeling\bod_krig_quad
Semivariogram properties QuadraticDrift 0.000162 # # #
Output cell size 5.58453868802189E-04
Search radius VARIABLE 12
Output variance of prediction raster

==========
Environments
Extent 119.895138684 -4.18208783999995 120.034752151201 -4.03591049457179
GEOGCS["GCS_WGS_1984",DATUM["D_WGS_1984",SPHEROID["WGS_1984",6378137.0,298.257223563]],PRIMEM["Greenwich",0.0],UNIT["Degree",0.0174532925199433]]
Mask Danau
==========
Messages
Start Time: 16 March 2023 23:14:27
QUADRATIC DRIFT
Lag size = 0.000162
Partial sill = 1961.616029
Nugget = 0.000000
Major range = 0.000000
Succeeded at 16 March 2023 23:14:28 (Elapsed Time: 0.66 seconds)

c. COD
Kriging
==========
Parameters
Input point features Titik_Sampling
Z value field COD
Output surface raster C:\Users\ASUS\Documents\ArieRafi\All GIS Project\Analisia Kualitas Air Tempe\Digitasi Modeling\cod_krig_quad
Semivariogram properties QuadraticDrift 0.000162 # # #
Output cell size 5.58453868802189E-04
Search radius VARIABLE 12
Output variance of prediction raster
==========
Environments
Extent 119.895138684 -4.18208783999995 120.034752151201 -4.03591049457179
GEOGCS["GCS_WGS_1984",DATUM["D_WGS_1984",SPHEROID["WGS_1984",6378137.0,298.257223563]],PRIMEM["Greenwich",0.0],UNIT["Degree",0.0174532925199433]]
Mask Danau
==========
Messages
Start Time: 16 March 2023 23:20:11
QUADRATIC DRIFT
Lag size = 0.000162
Partial sill = 9382.299479
Nugget = 0.000000
Major range = 0.000000

Succeeded at 16 March 2023 23:20:12 (Elapsed Time: 0.67 seconds)

d. Fenol

Kriging
==========
Parameters
Input point features Titik_Sampling
Z value field FENOL
Output surface raster C:\Users\ASUS\Documents\ArieRafi\All GIS Project\Analisia Kualitas Air Tempe\Digitasi Modeling\fenol_krigQ
Semivariogram properties QuadraticDrift 0.000162 # # #
Output cell size 5.58453868802189E-04
Search radius VARIABLE 12
Output variance of prediction raster
==========
Environments
Extent 119.895138684 -4.18208783999995 120.034752151201 -4.03591049457179
GEOGCS["GCS_WGS_1984",DATUM["D_WGS_1984",SPHEROID["WGS_1984",6378137.0,298.257223563]],PRIMEM["Greenwich",0.0],UNIT["Degree",0.0174532925199433]]
Mask Danau
==========
Messages
Start Time: 16 March 2023 23:22:10
QUADRATIC DRIFT
Lag size = 0.000162
Partial sill = 0.000044
Nugget = 0.000000
Major range = 0.000000
Succeeded at 16 March 2023 23:22:11 (Elapsed Time: 0.68 seconds)

e. Kromium Total

Kriging
==========
Parameters
Input point features Titik Sampling
Z value field Chromium
Output surface raster C:\Users\ASUS\Documents\ArieRafi\All GIS Project\Analisia Kualitas Air Tempe\Digitasi Modeling\chrom_krig4
Semivariogram properties Spherical 0.000162 # # #
Output cell size C:\Users\ASUS\Documents\Iccang\All GIS Project\Analisia Kualitas Air Tempe\Digitasi Modeling\fenol_krigQ
Search radius VARIABLE 12
Output variance of prediction raster
==========

Environments

Snap Raster Danau
Extent 119.895138684 -4.18208783999995 120.034752151201 -4.03591049457179
GEOGCS["GCS_WGS_1984",DATUM["D_WGS_1984",SPHEROID["WGS_1984",6378137.0,298.257223563]],PRIMEM["Greenwich",0.0],UNIT["Degree",0.0174532925199433]]
Mask Danau
==========
Messages

Start Time: 09 August 2023 19:04:36
SPHERICAL
Lag size = 0.000162
Partial sill = 0.000115
Nugget = 0.000000
Major range = 0.003995
Succeeded at 09 August 2023 19:04:43 (Elapsed Time: 6.59 seconds)