

# Water Sciences Laboratory

## Analyte/Protocol Price List

### 2019



**Nebraska  
Water Center**  
Daugherty Water for Food Global Institute

## IRMS :: Water

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Protocol	Analyte	Reporting Level	Protocol Cost	NU Cost (20% discount)
<p><b><math>\delta^{15}\text{N}</math> in nitrate/ammonia by distillation</b></p> <p>Protocol ID: 12_01_01_01</p> <p><b>Reference:</b> Gormly, J. R.; Spalding, R. F. (1979), "Sources and Concentrations of Nitrate-Nitrogen in Ground Water of the Central Platte Region, Nebraska", <i>Ground Water</i> 17(3), 291-301.</p> <p><b>Sample Container:</b> 125 mL polyethylene bottle <b>Sample Size:</b> 900 mL <b>Preservation:</b> Frozen <b>Holding Time:</b> 60 Days <b>Estimated Turnaround Time:</b> 6-8 Weeks</p>	<p><math>\delta\text{NH}_4\text{-}^{15}\text{N}</math> <math>\delta\text{NO}_3\text{-}^{15}\text{N}</math> NH<sub>4</sub>-N NO<sub>3</sub>-N</p>	<p>Pending Pending 0.1 mg/L 0.1 mg/L</p>	<b>\$137.50</b>	\$110.00
<p><b><math>\delta^{15}\text{N}</math> in ammonia by distillation</b></p> <p>Protocol ID: 12_01_01_03</p> <p><b>Sample Container:</b> 125 mL polyethylene bottle <b>Sample Size:</b> 500 mL <b>Preservation:</b> Frozen <b>Holding Time:</b> 60 Days <b>Estimated Turnaround Time:</b> 6-8 Weeks</p>	$\delta^{15}\text{N}$	Pending	<b>\$93.50</b>	\$74.80
<p><b>Deuterium in water</b></p> <p>Protocol ID: 12_01_03_01</p> <p><b>Reference:</b> J. Morrison T. Brockwell T. Merren F. Fourel A. M. Phillips (2001), "On-Line High-Precision Stable Hydrogen Isotopic Analyses on Nanoliter Water Samples", <i>Analytical Chemistry</i> 73, 3570-3575.</p> <p><b>Sample Container:</b> 125 mL polyethylene bottle <b>Sample Size:</b> 20 mL <b>Preservation:</b> Frozen</p>	$\delta\text{D-H}_2\text{O\_SMOW}$	Pending	<b>\$27.50</b>	\$22.00

Turnaround times are subject to existing sample queues.

Reporting Limits are subject to verification

\* = protocol cost is per analyte

& = add digestion cost of \$8/sample

Protocol	Analyte	Reporting Level	Protocol Cost	NU Cost (20% discount)
<b>Holding Time:</b> 60 Days <b>Estimated Turnaround Time:</b> 6-8 Weeks				
<b><math>\delta^{18}\text{O}</math> of water</b> <b>Protocol ID:</b> 12_01_05_01  <b>Reference:</b> Hsieh, Jean C. C. Savin, Samuel M. Kelly, Eugene F. Chadwick, Oliver A. (1998), "Measurement of soil-water $\delta^{18}\text{O}$ values by direct equilibration with $\text{CO}_2$ ", <i>Geoderma</i> <b>82</b> , 255-268.  Epstein, S. and Mayeda, T. (1953), "Variation of O18 content of waters from natural sources", <i>Geochimica et Cosmochimica Acta</i> <b>4</b> , 213-224.  <b>Sample Container:</b> 125 mL polyethylene bottle <b>Sample Size:</b> 20 mL <b>Preservation:</b> Frozen <b>Holding Time:</b> 60 Days <b>Estimated Turnaround Time:</b> 6-8 Weeks	$\delta^{18}\text{O}\text{-H}_2\text{O\_SMOW}$	Pending	<b>\$27.50</b>	\$22.00
<b><math>\delta^{13}\text{C}</math> in total organic carbon</b> <b>Protocol ID:</b> 12_01_07_01  <b>Reference:</b> Lang, Susan Q.;Bernasconi, Stefano M.; Fruh-Green, Gretchen L. (2012), "Stable isotope analysis of organic carbon in samll samples and DOM using gasbench preparation device", <i>Rapid Communications in mass spectometry</i> <b>26</b> , 9-16.  <b>Sample Container:</b> Pending <b>Sample Size:</b> Pending <b>Preservation:</b> Frozen <b>Holding Time:</b> 60 Days <b>Estimated Turnaround Time:</b> 6-8 Weeks	$\delta^{13}\text{C}$ (‰)	0.1 $\mu\text{g/L}$	<b>\$16.50</b>	\$13.20
<b><math>\delta\text{HD}</math>, <math>\delta^{18}\text{O}</math> in water by dual inlet</b> <b>Protocol ID:</b> 12_02_09_01  <b>Reference:</b> Epstein, S. and Mayeda, T. (1953), "Variation of O18 content of waters from natural sources", <i>Geochimica et Cosmochimica Acta</i> <b>4</b> , 213-224.  <b>Sample Container:</b> 125 mL polyethylene bottle <b>Sample Size:</b> 50 mL <b>Preservation:</b> Frozen	$\delta^{18}\text{O}\text{-H}_2\text{O}$ (smow) $2\text{H}\text{-H}_2\text{O}$ (smow)	Pending Pending	<b>\$33.00</b>	\$26.40

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Protocol	Analyte	Reporting Level	Protocol Cost	NU Cost (20% discount)
<b>Holding Time:</b> 60 Days <b>Estimated Turnaround Time:</b> 6-8 Weeks				
<b>Ar/15N ratio</b> <b>Protocol ID:</b> 12_02_10_07  <b>Reference:</b> Martin, G. E.; Snow, D. D.; Kim, E.; Spalding, R. F. (1995), "Simultaneous determination of argon and nitrogen", <i>Ground Water</i> <b>33</b> (5), 781-785.  <b>Sample Container:</b> 125 mL polyethylene bottle <b>Sample Size:</b> 250 mL <b>Preservation:</b> Frozen <b>Holding Time:</b> 60 Days <b>Estimated Turnaround Time:</b> 6-8 Weeks	$\delta^{15}\text{N}$ Ar/N	Pending Pending	<b>\$55.00</b>	\$44.00
<b><math>\delta^{18}\text{O}</math> and <math>\delta^{15}\text{N}</math> in <math>\text{NO}_3^-</math> in water by azide reduction</b> <b>Protocol ID:</b> 12_02_11_01  <b>Reference:</b> McIlvin, Matthew R.; Altabet, Mark A. (2005), "Chemical conversion of nitrate and nitrite to nitrous oxide for nitrogen and oxygen isotopic analysis in freshwater and seawater", <i>Anal. Chem.</i> <b>77</b> , 5589-5595.  <b>Sample Container:</b> 125 mL polyethylene bottle <b>Sample Size:</b> 100 mL <b>Preservation:</b> Frozen <b>Holding Time:</b> 60 Days <b>Estimated Turnaround Time:</b> 6-8 Weeks	$\delta^{15}\text{N}$ $\delta^{18}\text{O}$	Pending Pending	<b>\$110.00</b>	\$88.00
<b><math>\delta^{15}\text{N}</math> in <math>\text{NO}_3^-</math> by silver nitrate precipitation</b> <b>Protocol ID:</b> 12_03_02_01  <b>Reference:</b> Chang, C. C. Y.; Langston, J.; Riggs, M.; Campbell, D. H.; Silva, S. R.; Kendall, C. (1999), "A Method for Nitrate Collection for $^{15}\text{N}$ and $^{18}\text{O}$ Analysis from Waters with Low Nitrate Concentrations", <i>Can. J. Fish. Aquat. Sci</i> <b>56</b> , 1856-1864.  <b>Sample Container:</b> 125 mL polyethylene bottle <b>Sample Size:</b> 900 mL <b>Preservation:</b> Frozen <b>Holding Time:</b> 60 Days	$\delta^{18}\text{O}$ -Nitrate	0.1 mg/L	<b>\$93.50</b>	\$74.80

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Protocol	Analyte	Reporting Level	Protocol Cost	NU Cost (20% discount)
<b>Estimated Turnaround Time:</b> 6-8 Weeks				
<p><b><math>\delta^{18}O</math> in PO4</b></p> <p><b>Protocol ID:</b> 12_03_10_01</p> <p><b>Reference:</b> McLaughlin, K.; Silva, S.; Kendall, C.; Stuart-Williams, H.; Paytan, A. (2004), "A Precise Method for the Analysis of <math>^{18}O</math> of Dissolved Inorganic Phosphate in Seawater", <i>Limnology and Oceanography</i>: <i>Methods</i> <b>2</b>, 202-212.</p> <p><b>Sample Container:</b> 125 mL polyethylene bottle  <b>Sample Size:</b> 900 mL  <b>Preservation:</b> Frozen  <b>Holding Time:</b> 60 Days  <b>Estimated Turnaround Time:</b> 6-8 Weeks</p>	<p><math>\delta^{18}O</math> in PO4</p>	<p>Pending</p>	<p><b>\$93.50</b></p>	<p>\$74.80</p>
<p><b><math>\delta^{15}N</math> of Total Kjeldahl Nitrogen digests</b></p> <p><b>Protocol ID:</b> 14_01_01</p> <p><b>Reference:</b> Gormly, J. R.; Spalding, R. F. (1979), "Sources and Concentrations of Nitrate-Nitrogen in Ground Water of the Central Platte Region, Nebraska", <i>Ground Water</i> <b>17</b>(3), 291-301.</p> <p>Sadayappan Mariappan , Mary E. Exner , Glen E. Martin , Roy F. Spalding (2009), "Variability of Anaerobic Animal Waste Lagoon <math>\delta^{15}N</math> Source Signatures", <i>Environmental Forensics</i> <b>10</b>(1), 19-26.</p> <p><b>Sample Container:</b> 125 mL polyethylene bottle  <b>Sample Size:</b> 250 mL  <b>Preservation:</b> Frozen  <b>Holding Time:</b> 60 Days  <b>Estimated Turnaround Time:</b> 6-8 Weeks</p>	<p><math>\delta^{15}N</math> TKN</p>	<p>0.2 mg/L 0.2 mg/L</p>	<p><b>\$165.00</b></p>	<p>\$132.00</p>

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