

## Cascadia Daily GNSS Time Series Denoising: Graph Neural Network and Stack Filtering: Supplementary material

	University Nevada Reno					
	Average offset mm			Max offset in mm		
Dataset	East	North	Vertical	East	North	Vertical
UNR original	1.083	1.029	3.259	4.869	4.631	14.237
GNN	0.283	0.271	0.81	1.437	1.456	4.673
Wdowinski	0	0	0	0	0	0
Tremor stack	0.025	0.022	0.149	0.255	0.16	0.627
400km stack	0.05	0.031	0.149	0.262	0.162	0.775

**Table 1: University Nevada Reno absolute network offset in mm for all the different denoising techniques.**

	University Nevada Reno					
	Average offset reduction %			Max offset		
Dataset	East	North	Vertical	East	North	Vertical
GNN	74%	74%	75%	70%	69%	67%
Wdowinski	100%	100%	100%	100%	100%	100%
Tremor stack	98%	98%	95%	95%	97%	96%
400km stack	95%	97%	95%	95%	97%	95%

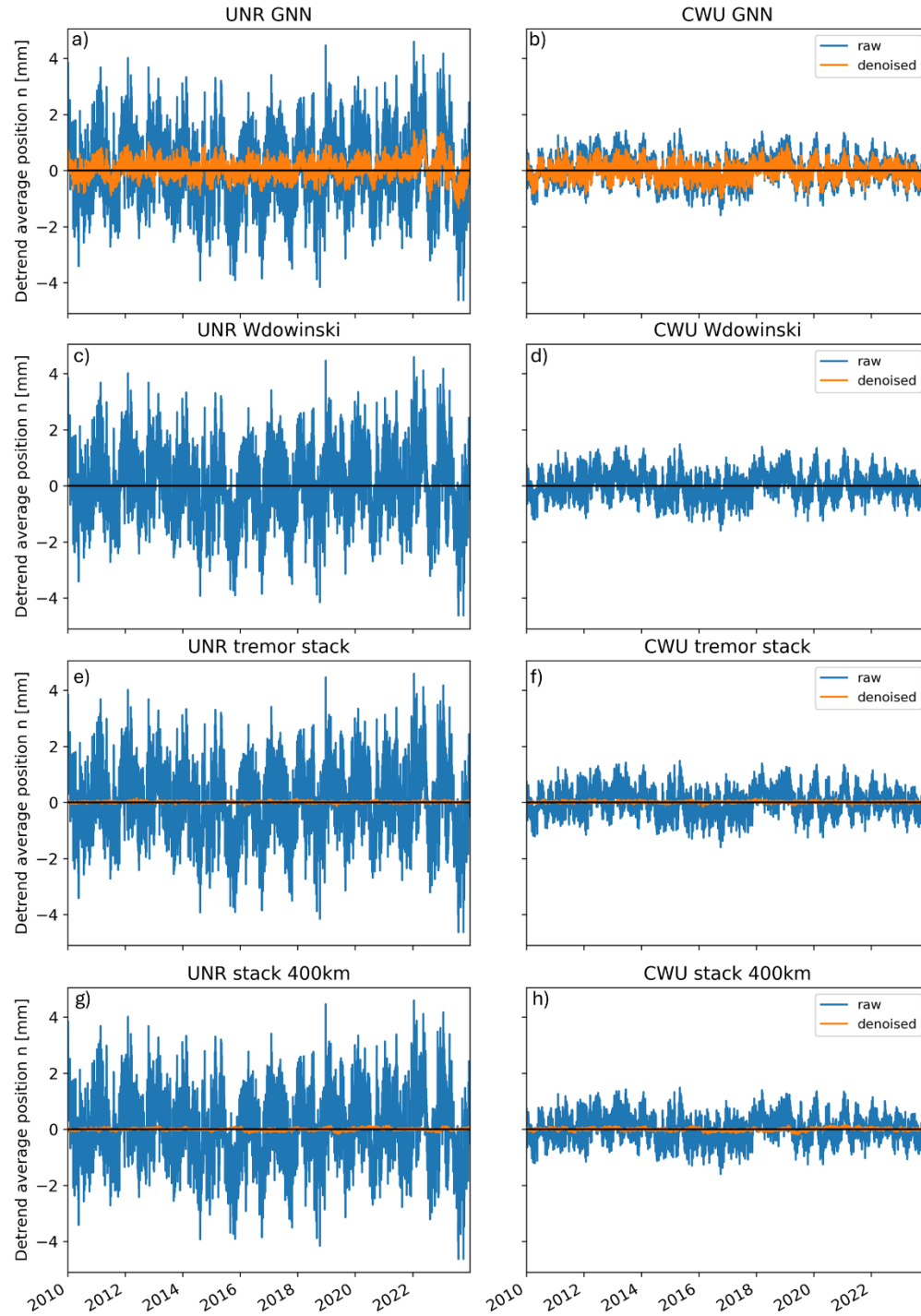
**Table 2: University Nevada Reno relative network offset reduction in % of original dataset for all the different denoising techniques.**

	Central Washington University					
	Average offset mm			Max offset in mm		
Dataset	East	North	Vertical	East	North	Vertical
CWU original	0.364	0.366	4.233	1.641	1.601	21.822
GNN	0.256	0.231	1.219	1.039	1.01	6.298
Wdowinski	0	0	0	0	0	0
Tremor stack	0.027	0.024	0.324	0.261	0.155	1.142
400km stack	0.056	0.037	0.183	0.239	0.186	0.747

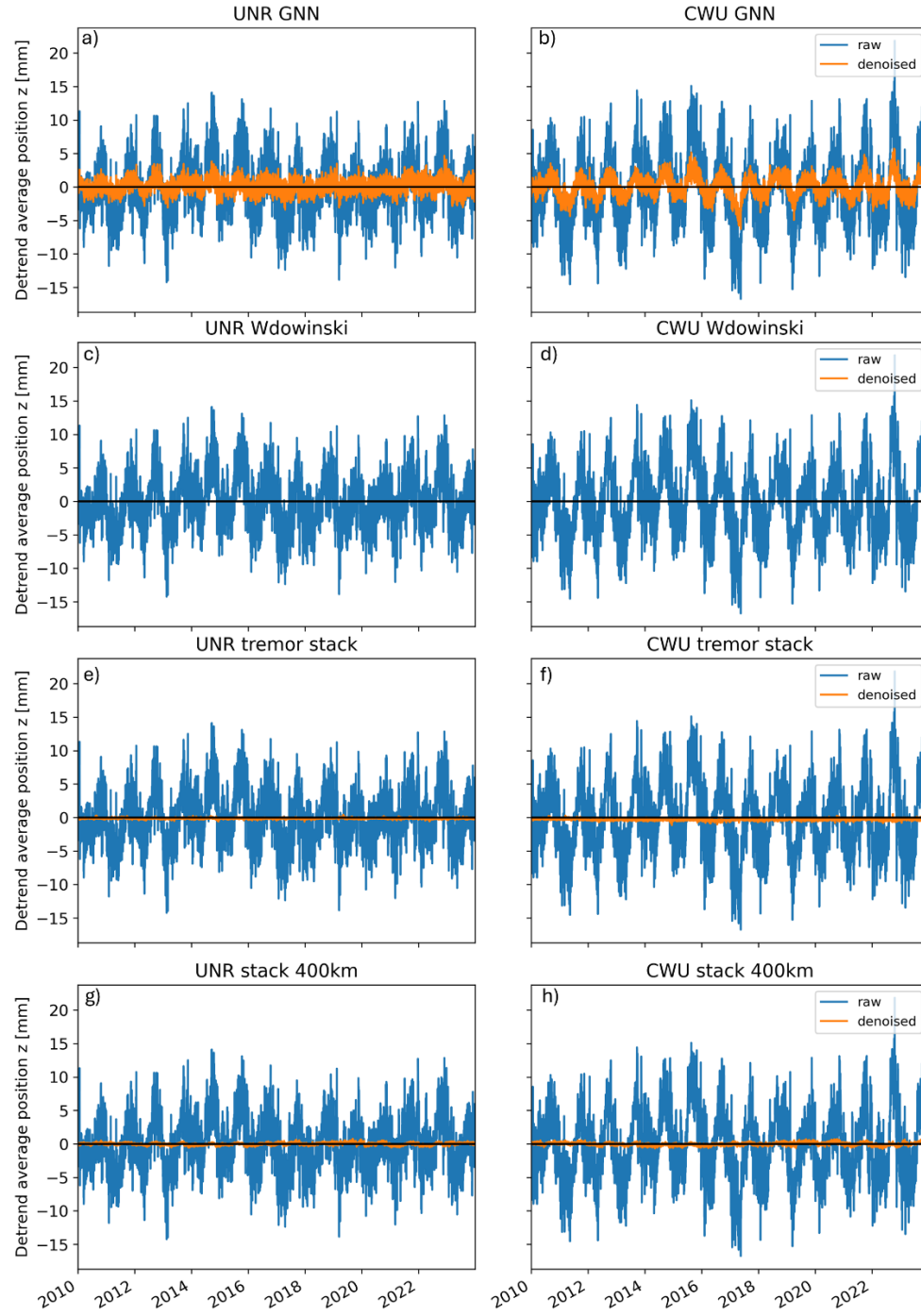
**Table 3: Central Washington University absolute network offset in mm for all the different denoising techniques.**

	Central Washington University					
	Average offset reduction %			Max offset		
Dataset	East	North	Vertical	East	North	Vertical
GNN	30%	37%	71%	37%	37%	71%
Wdowinski	100%	100%	100%	100%	100%	100%
Tremor stack	93%	93%	92%	84%	90%	95%
400km stack	85%	90%	96%	85%	88%	97%

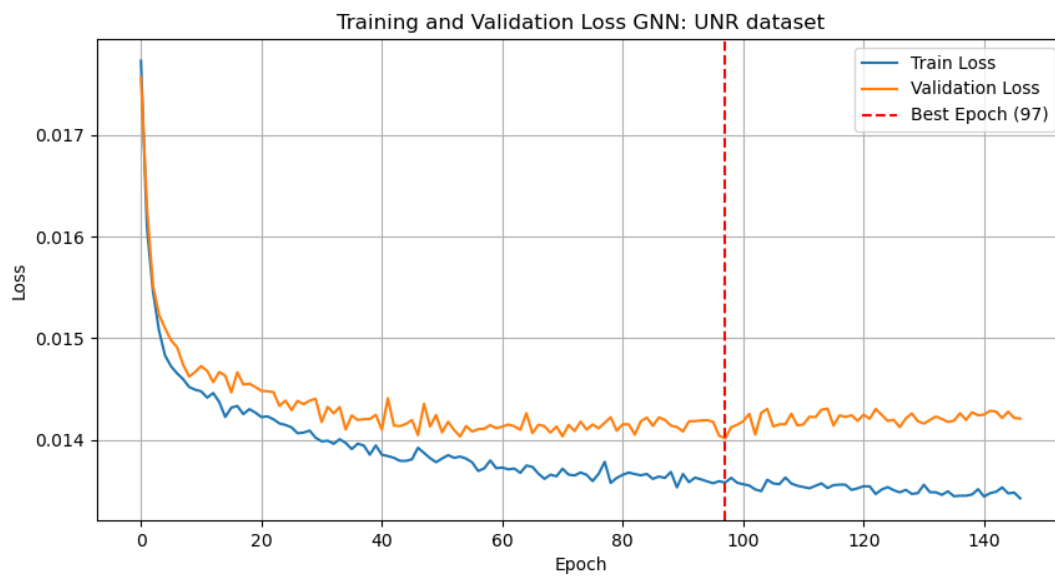
**Table 4: Central Washington University relative network offset reduction in % of original dataset for all the different denoising techniques.**



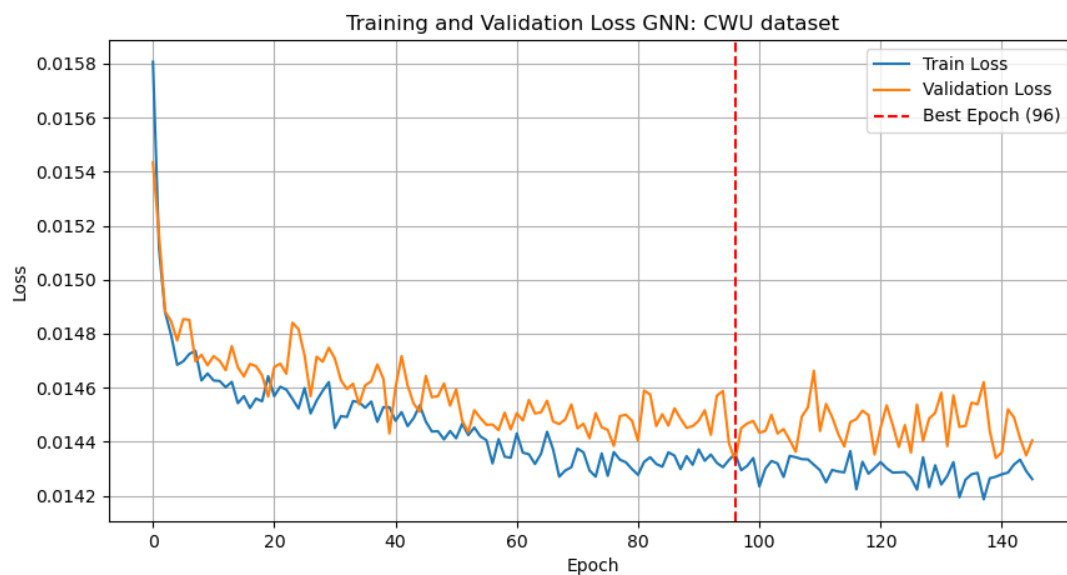
**S1: Time series of the average detrended position of the network on the north component only for the UNR dataset on the left, and the CWU on the right. Each row is a different denoising process. The raw data is shown in blue and the denoised data is shown in orange.**



**S2: Time series of the average detrended position of the network on the vertical component only for the UNR dataset on the left, and the CWU on the right. Each row is a different denoising process. The raw data is shown in blue and the denoised data is shown in orange.**



**S3: Training loss curves for train data and validation data on the UNR dataset. The red dash line shows the best validation loss. The weights of the model are restored to that checkpoint.**



**S4: Training loss curves for train data and validation data on the CWU dataset. The red dash line shows the best validation loss. The weights of the model are restored to that checkpoint.**