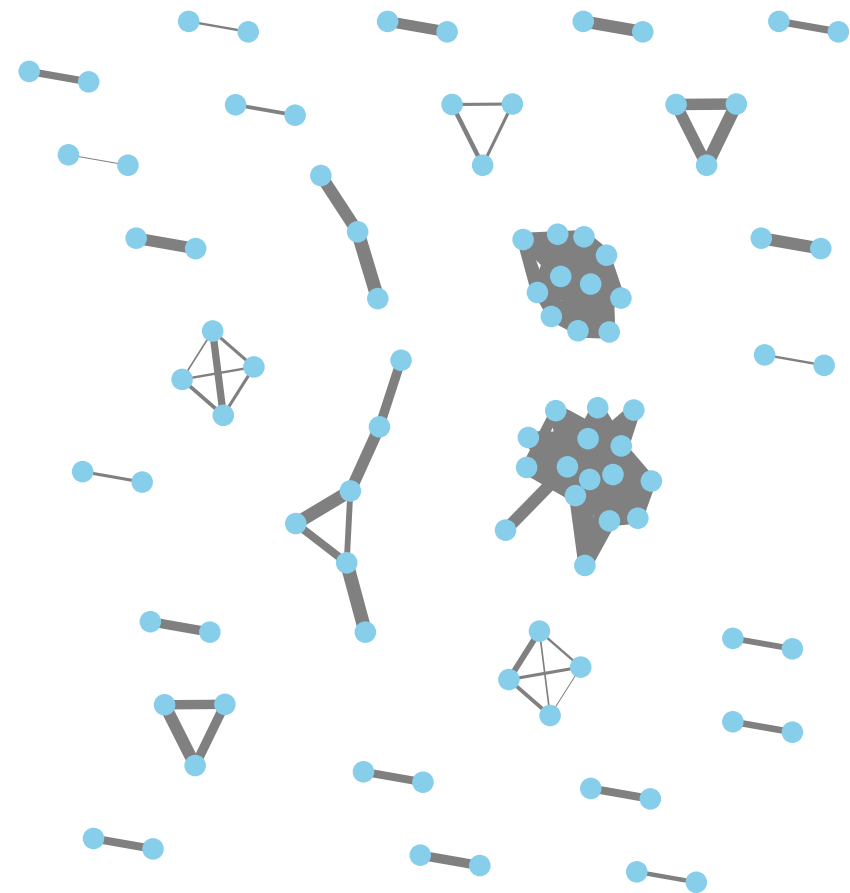# Cluster Quality Metrics for ST131

Network with SNP Distance < 20
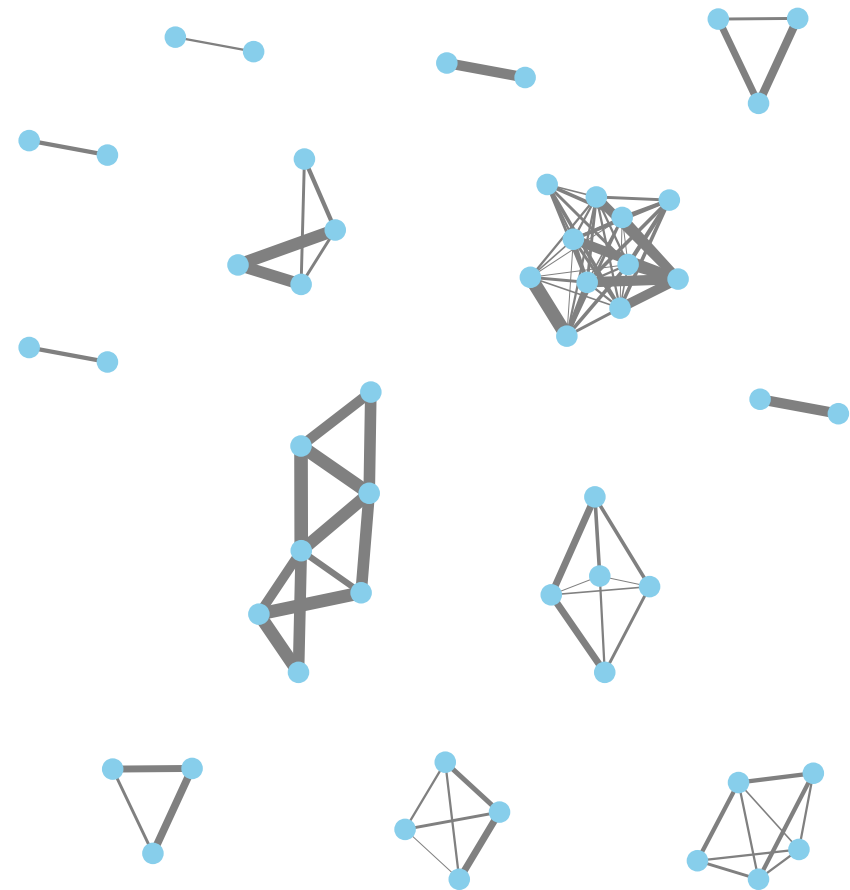
Network with SNP Distance < 100
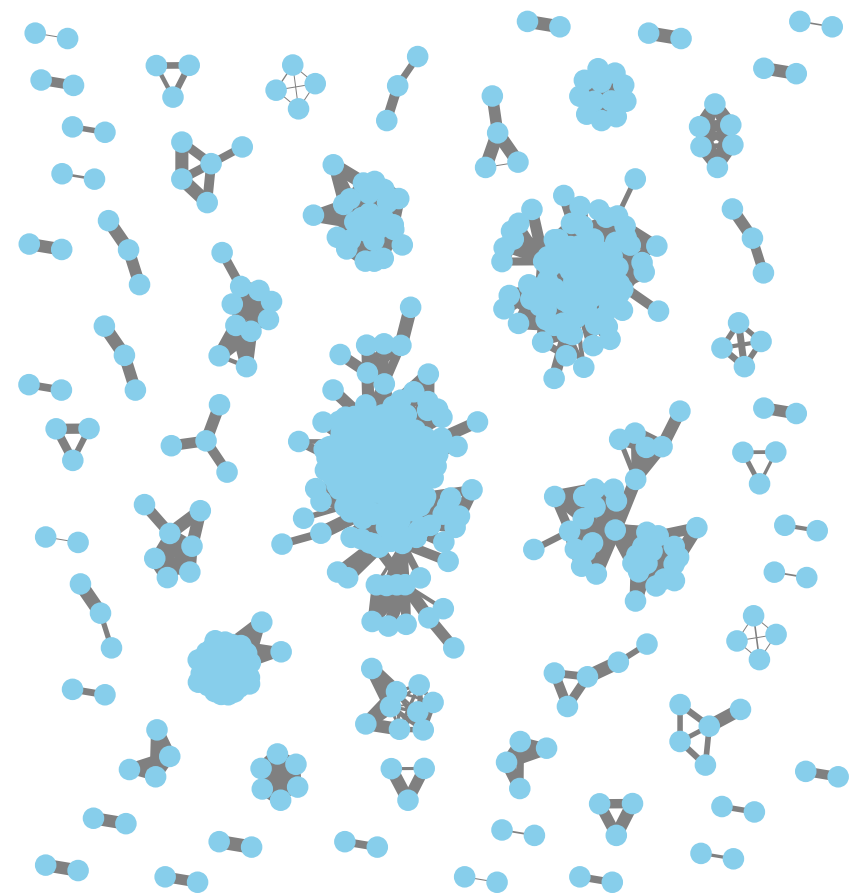
Metric	Observed Difference	p-value
Silhouette	0.1854	0.0000
Calinski-Harabasz	-3727.0280	0.0000
Davies-Bouldin	-1.0147	1.0000
WCSS	-2001003042.0467	0.0000
Cohesion	-1419331.9857	0.0000
Separation	-1418.6668	1.0000

Cluster Quality Metrics for ST95
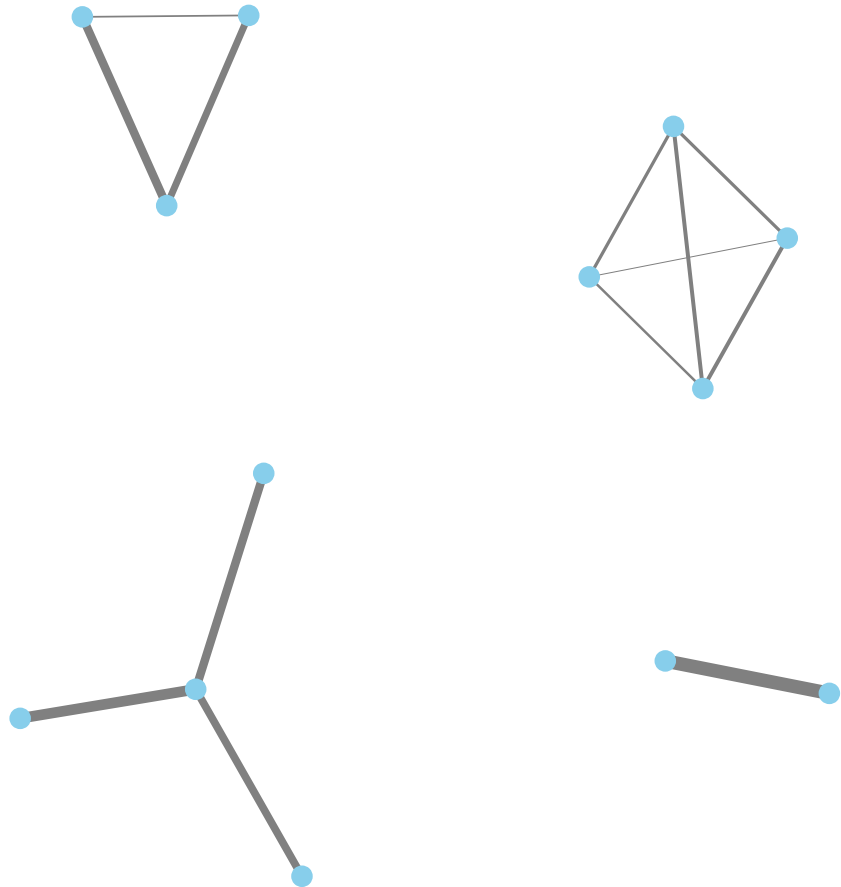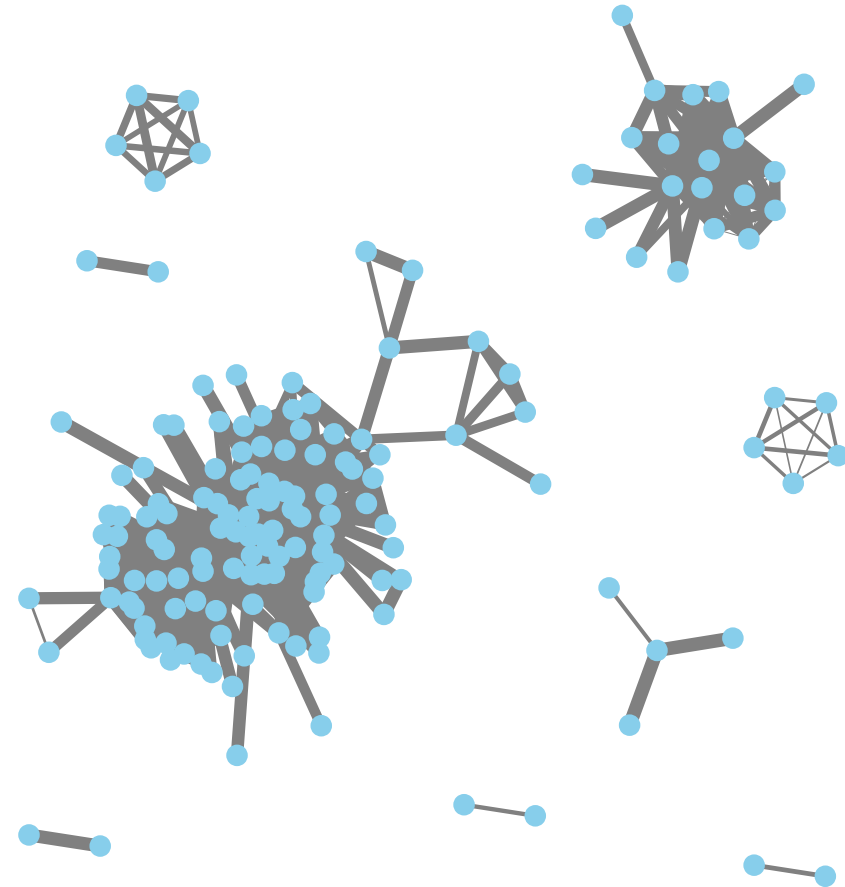
Network with SNP Distance < 20

Network with SNP Distance < 100
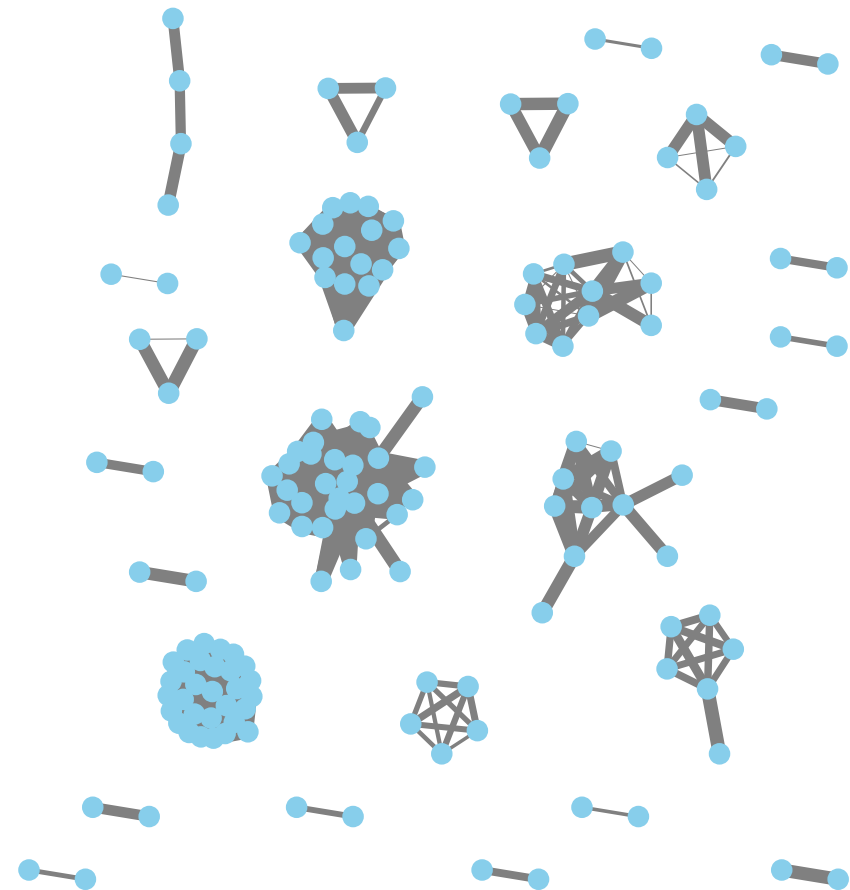
Metric	Observed Difference	p-value
Silhouette	0.1590	0.0000
Calinski-Harabasz	-782.2758	0.0000
Davies-Bouldin	-0.3770	0.0010
WCSS	-58685857.6525	0.0000
Cohesion	-310981.3034	0.2880
Separation	-539.9365	1.0000

Cluster Quality Metrics for ST1193
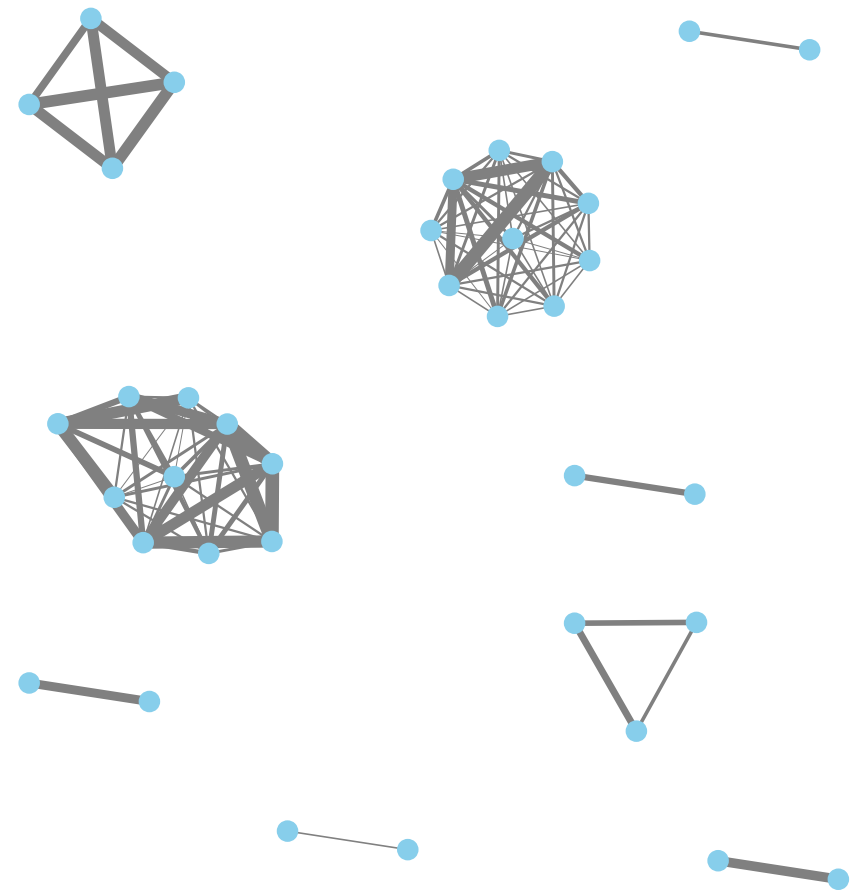
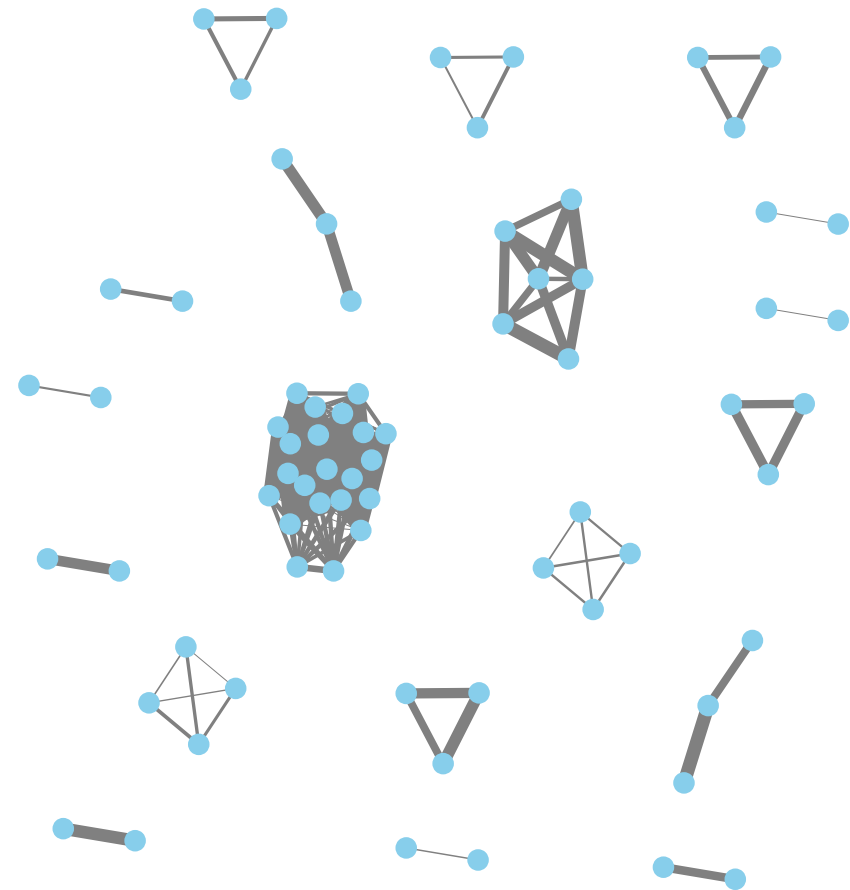Network with SNP Distance < 20

Network with SNP Distance < 100

Metric	Observed Difference	p-value
Silhouette	0.1624	0.0000
Calinski-Harabasz	-301.9431	0.0000
Davies-Bouldin	-1.2680	1.0000
WCSS	-65958871.9667	0.0000
Cohesion	-40185.8802	0.0000
Separation	-32.8812	1.0000

Cluster Quality Metrics for ST69
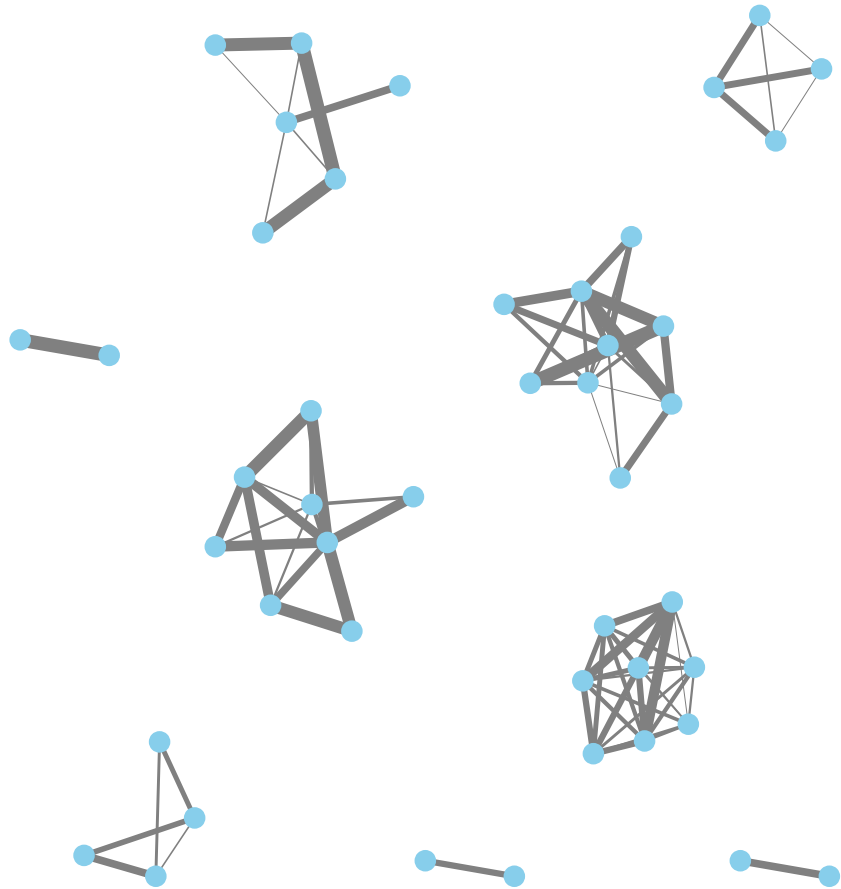

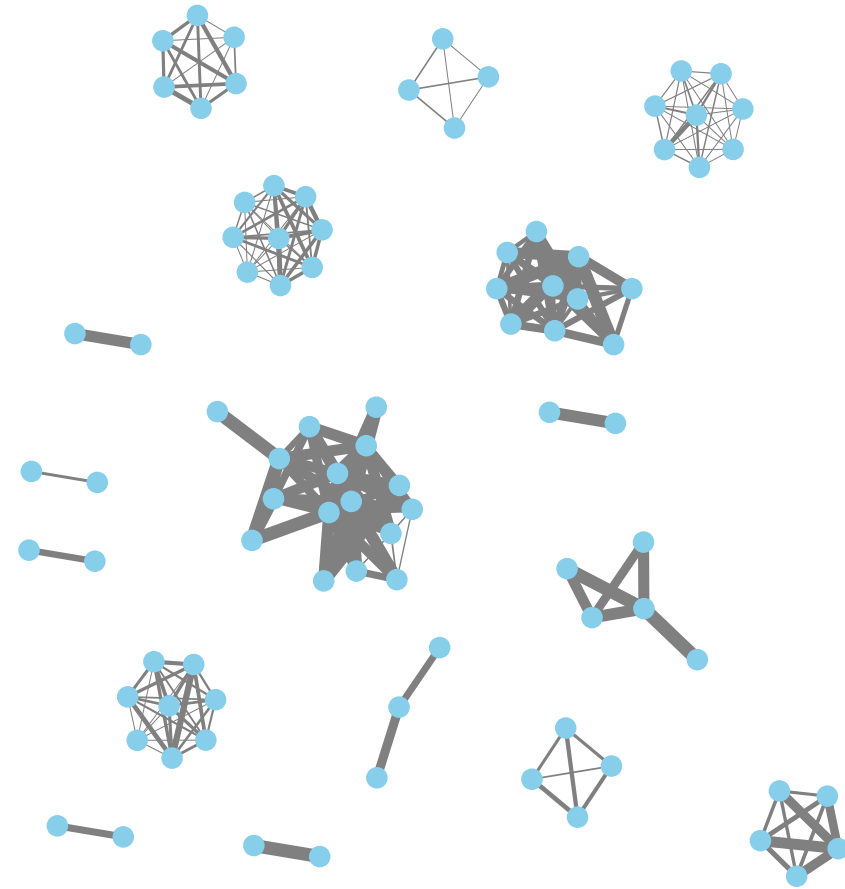Network with SNP Distance < 20

Network with SNP Distance < 100

Metric	Observed Difference	p-value
Silhouette	0.1702	0.4810
Calinski-Harabasz	-1314.1863	0.0000
Davies-Bouldin	-0.1221	0.0040
WCSS	-22167329.8083	0.0000
Cohesion	-125751.0176	0.4710
Separation	430.3998	1.0000

Cluster Quality Metrics for ST117
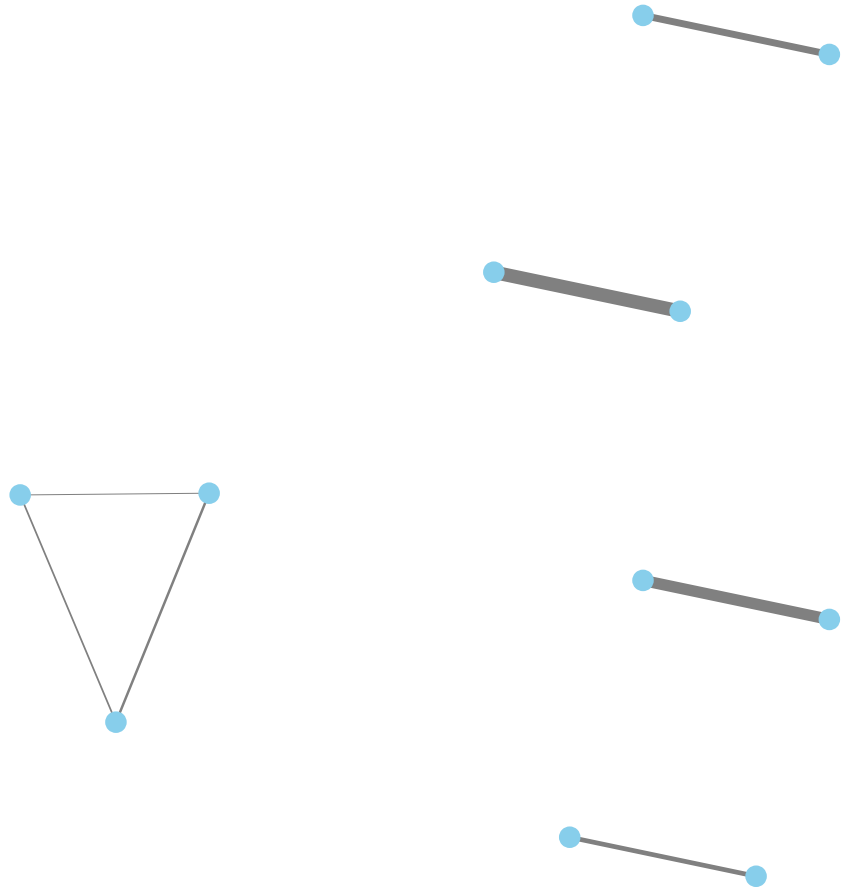
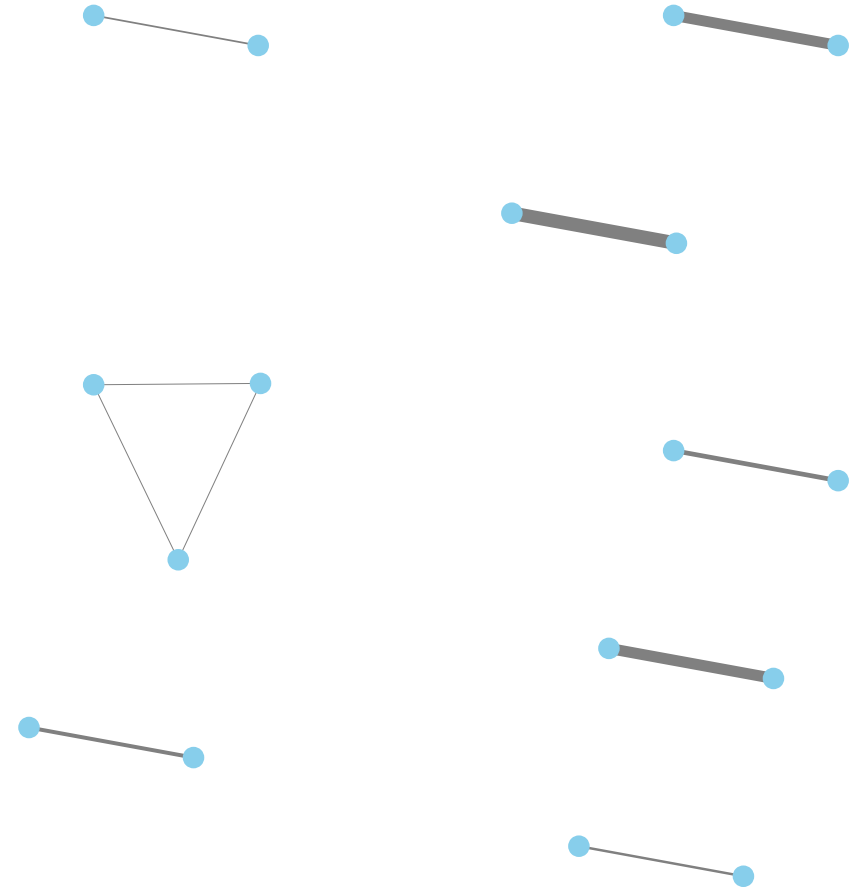Network with SNP Distance < 20

Network with SNP Distance < 100

Metric	Observed Difference	p-value
Silhouette	0.3303	0.9960
Calinski-Harabasz	-5389.8228	0.0000
Davies-Bouldin	-0.1555	0.1130
WCSS	-24834836.9833	0.0000
Cohesion	-227303.1209	1.0000
Separation	-275.6874	1.0000

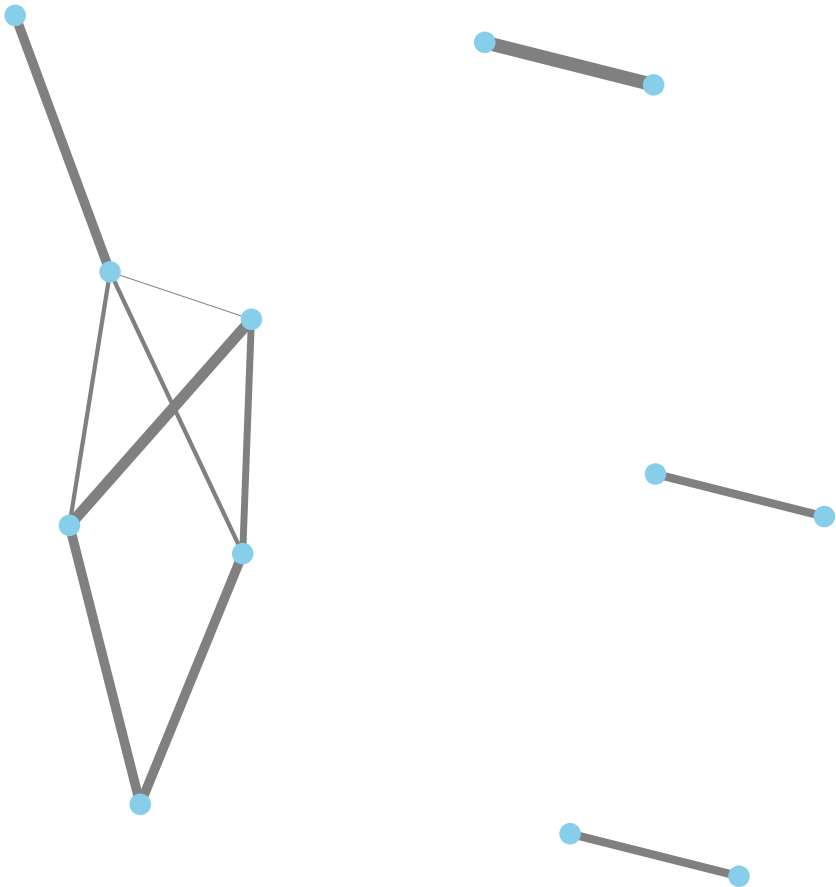# Cluster Quality Metrics for ST648

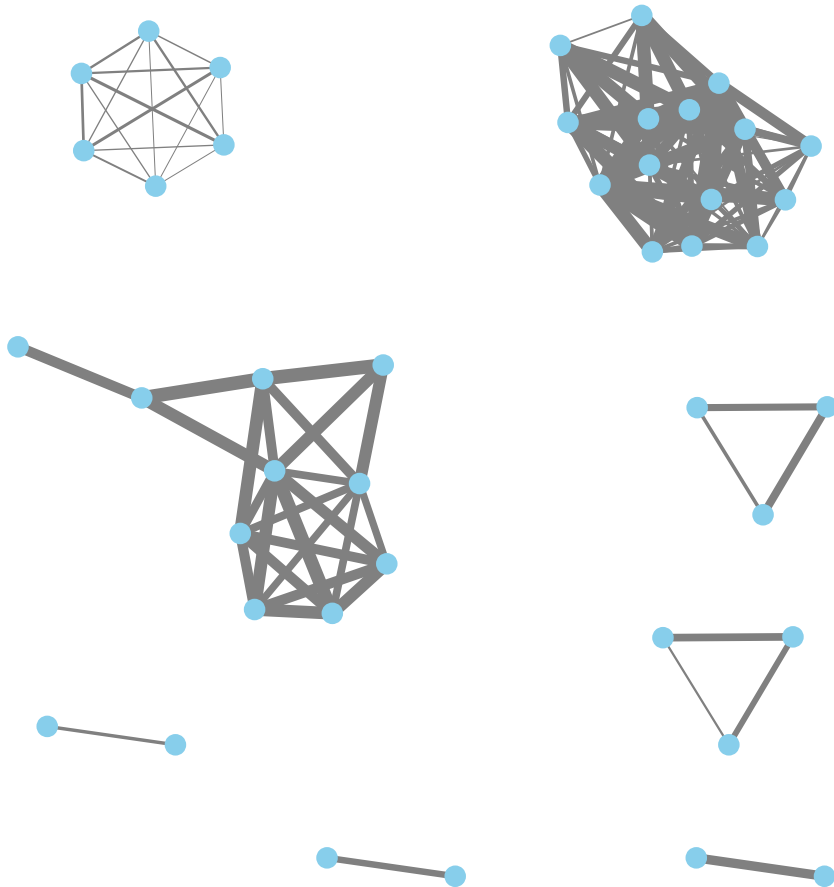Network with SNP Distance < 20

Network with SNP Distance < 100

Metric	Observed Difference	p-value
Silhouette	0.0326	0.6130
Calinski-Harabasz	1768.9853	1.0000
Davies-Bouldin	-0.0058	0.0870
WCSS	-21995.5000	0.0870
Cohesion	-10299.8276	0.7090
Separation	-14.2851	0.9130

Cluster Quality Metrics for ST57
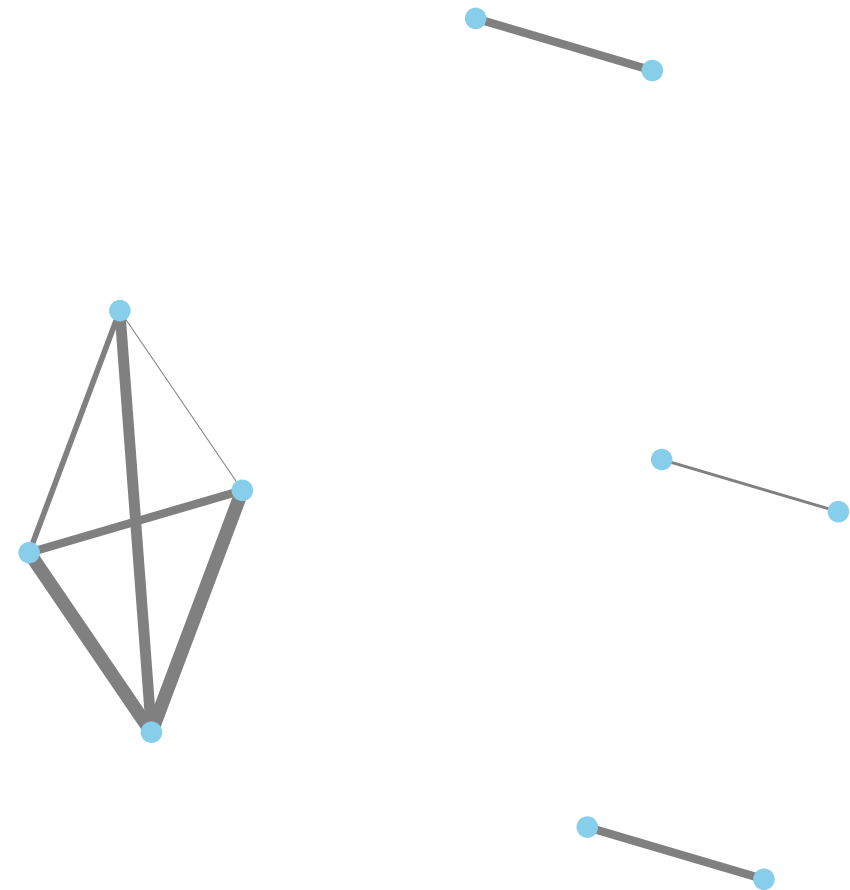
Network with SNP Distance < 20
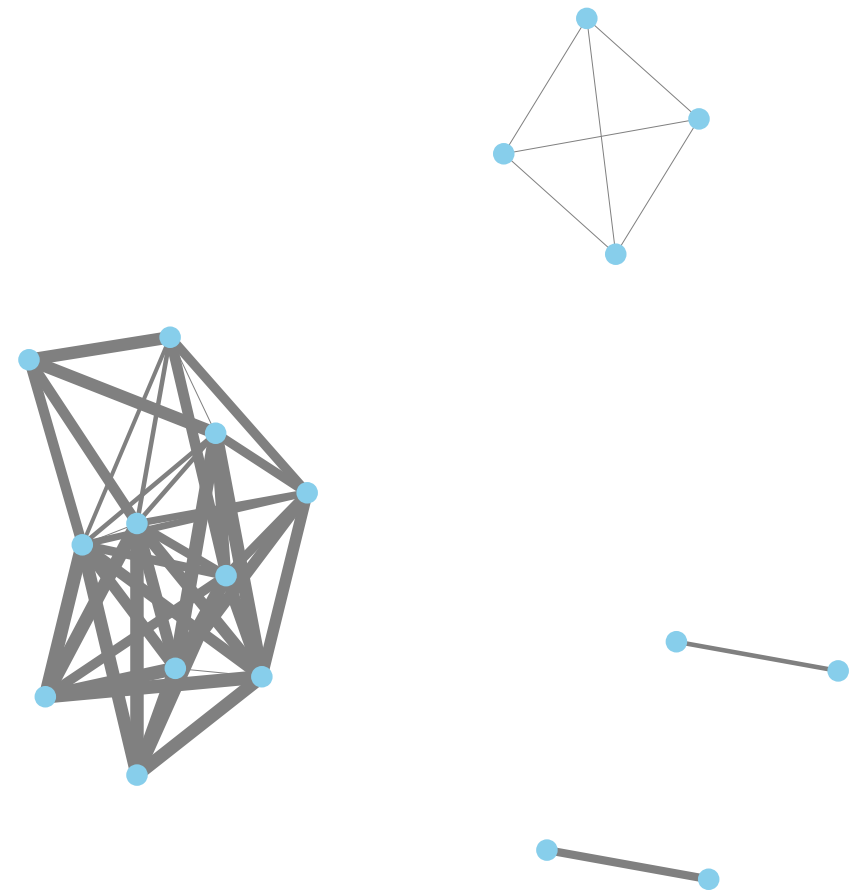
Network with SNP Distance < 100

Metric	Observed Difference	p-value
Silhouette	0.3766	0.3500
Calinski-Harabasz	-180779.8566	0.0000
Davies-Bouldin	-0.2089	0.0000
WCSS	-2159303.7000	0.0000
Cohesion	-212447.7261	1.0000
Separation	-4730.7306	0.2380

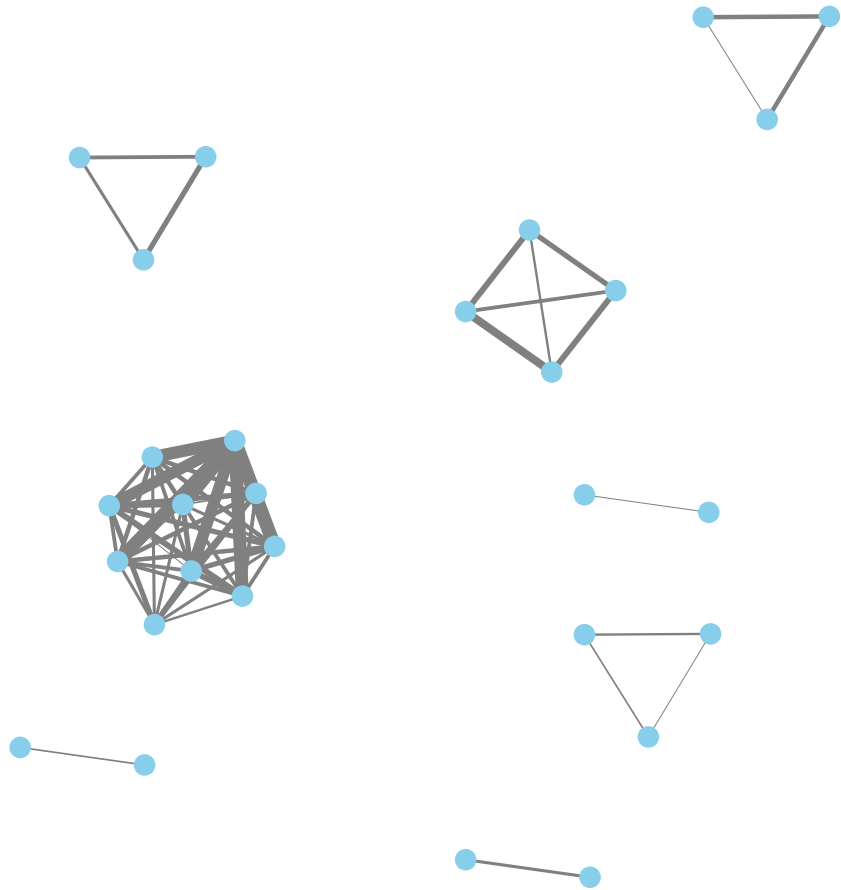# Cluster Quality Metrics for ST80

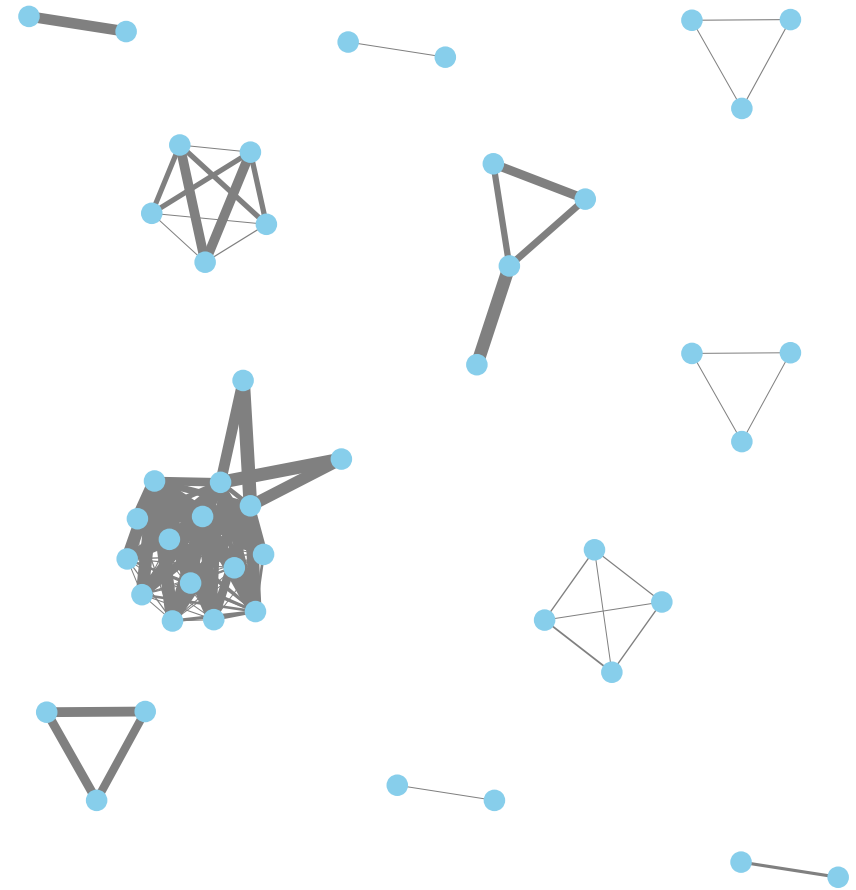Network with SNP Distance < 20

Network with SNP Distance < 100

Metric	Observed Difference	p-value
Silhouette	0.0688	0.0520
Calinski-Harabasz	-389.4906	0.0000
Davies-Bouldin	-0.4237	0.3680
WCSS	-2799825.3333	0.0000
Cohesion	-5206.3043	0.2180
Separation	256.9336	1.0000

Cluster Quality Metrics for ST457

Network with SNP Distance < 20

Network with SNP Distance < 100

Metric	Observed Difference	p-value
Silhouette	0.1331	0.6340
Calinski-Harabasz	-74595.8971	0.0000
Davies-Bouldin	-0.2578	0.7230
WCSS	-5577706.3833	0.0010
Cohesion	-55079.8475	0.9930
Separation	7.4104	1.0000