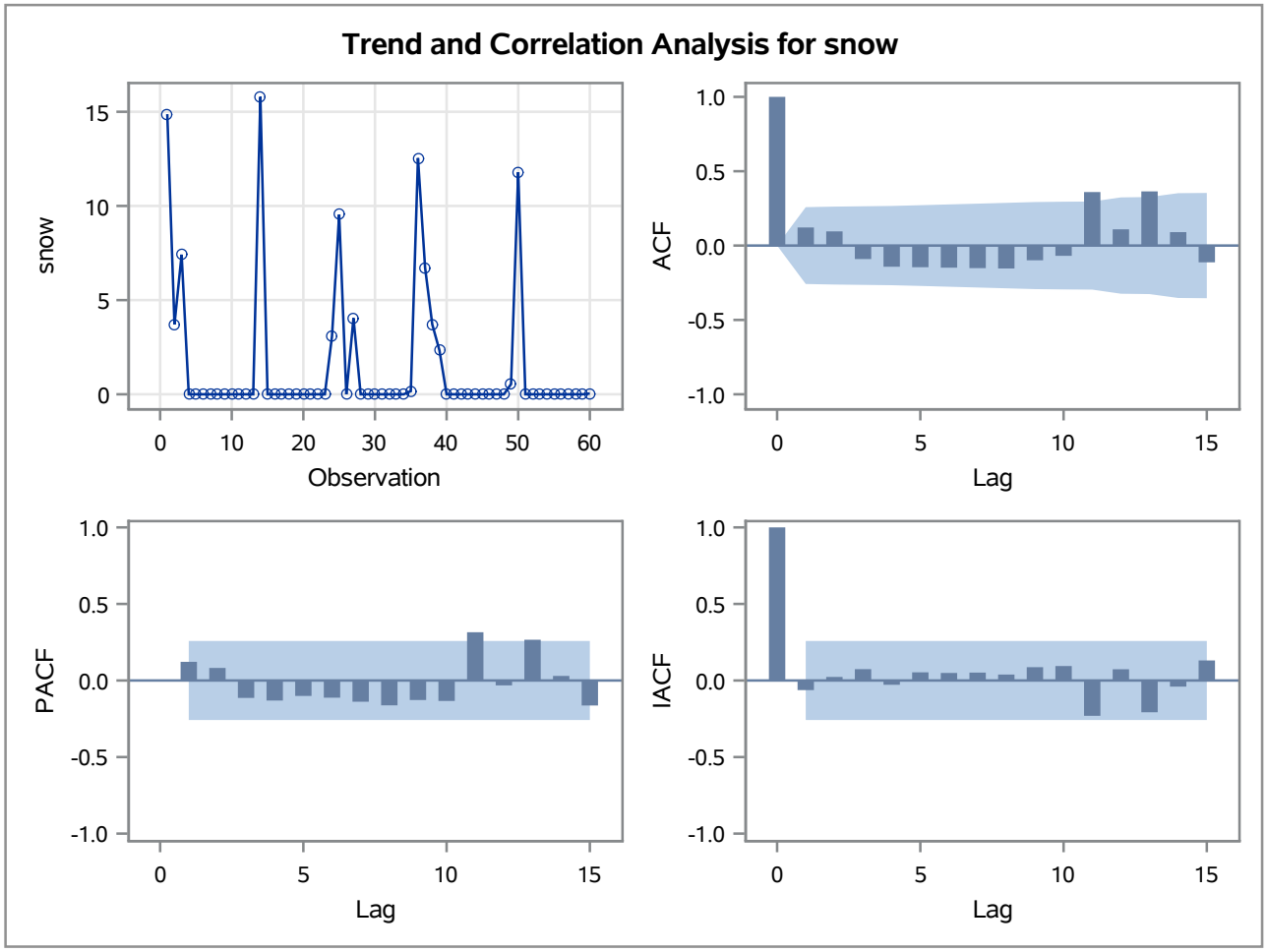
Name of Variable = snow	
Mean of Working Series	1.604861
Standard Deviation	3.791678
Number of Observations	60

Autocorrelation Check for White Noise									
To Lag	**Chi-Square**	**DF**	**Pr > ChiSq**	**Autocorrelations**					
6	6.35	6	0.3847	0.122	0.095	-0.091	-0.142	-0.146	-0.149
12	21.48	12	0.0438	-0.152	-0.154	-0.099	-0.069	0.360	0.109



Warning: The model defined by the new estimates is unstable. The iteration process has been terminated.

Warning: Estimates may not have converged.

ARIMA Estimation Optimization Summary	
Estimation Method	Maximum Likelihood
Parameters Estimated	5
Termination Criteria	Maximum Relative Change in Estimates
Iteration Stopping Value	0.001
Criteria Value	23.27727
Maximum Absolute Value of Gradient	90.96457

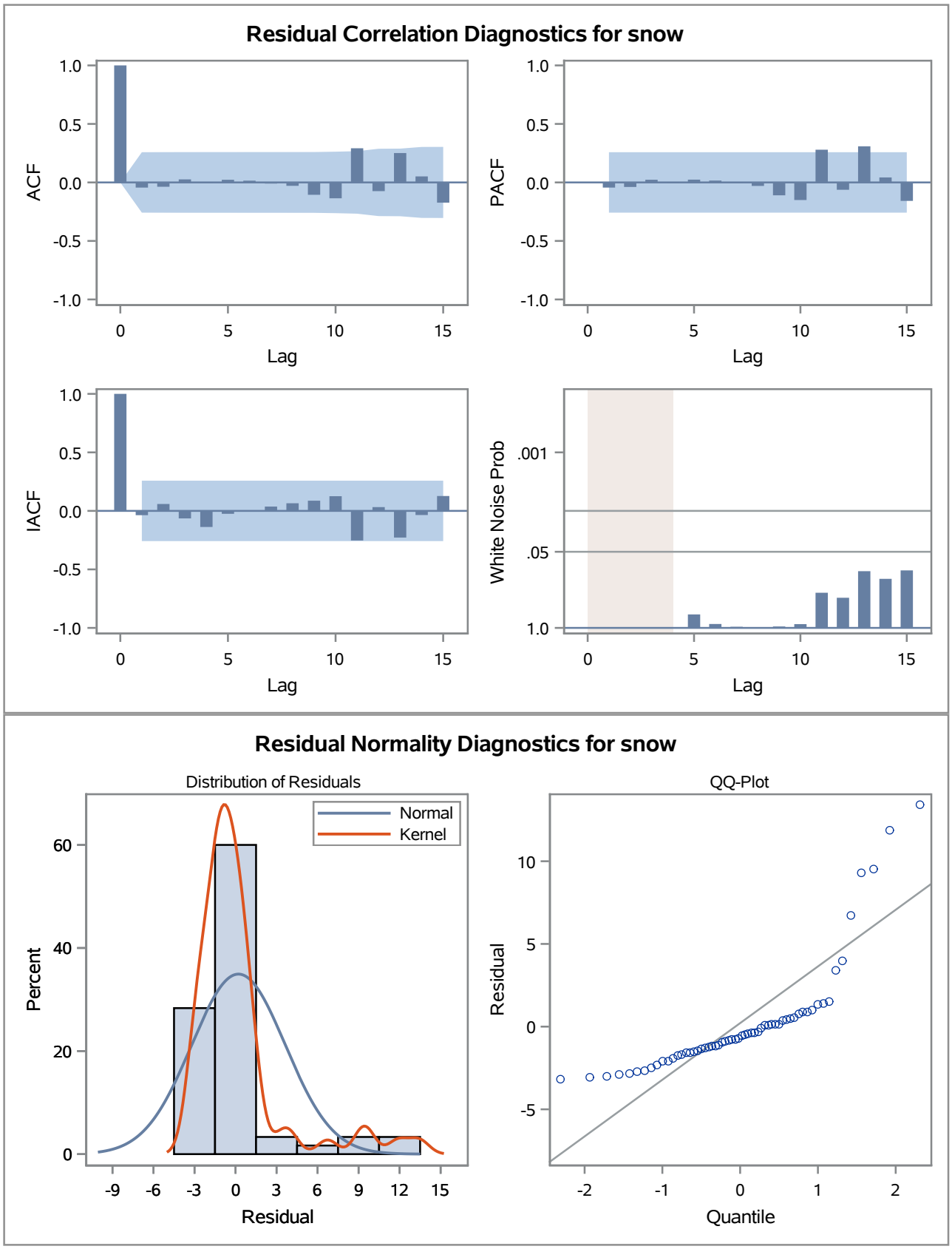
ARIMA Estimation Optimization Summary	
R-Square Change from Last Iteration	0.144403
Objective Function	Log Gaussian Likelihood
Objective Function Value	-160.13
Marquardt's Lambda Coefficient	0.00001
Numerical Derivative Perturbation Delta	0.001
Iterations	13
Warning Message	Estimates may not have converged.

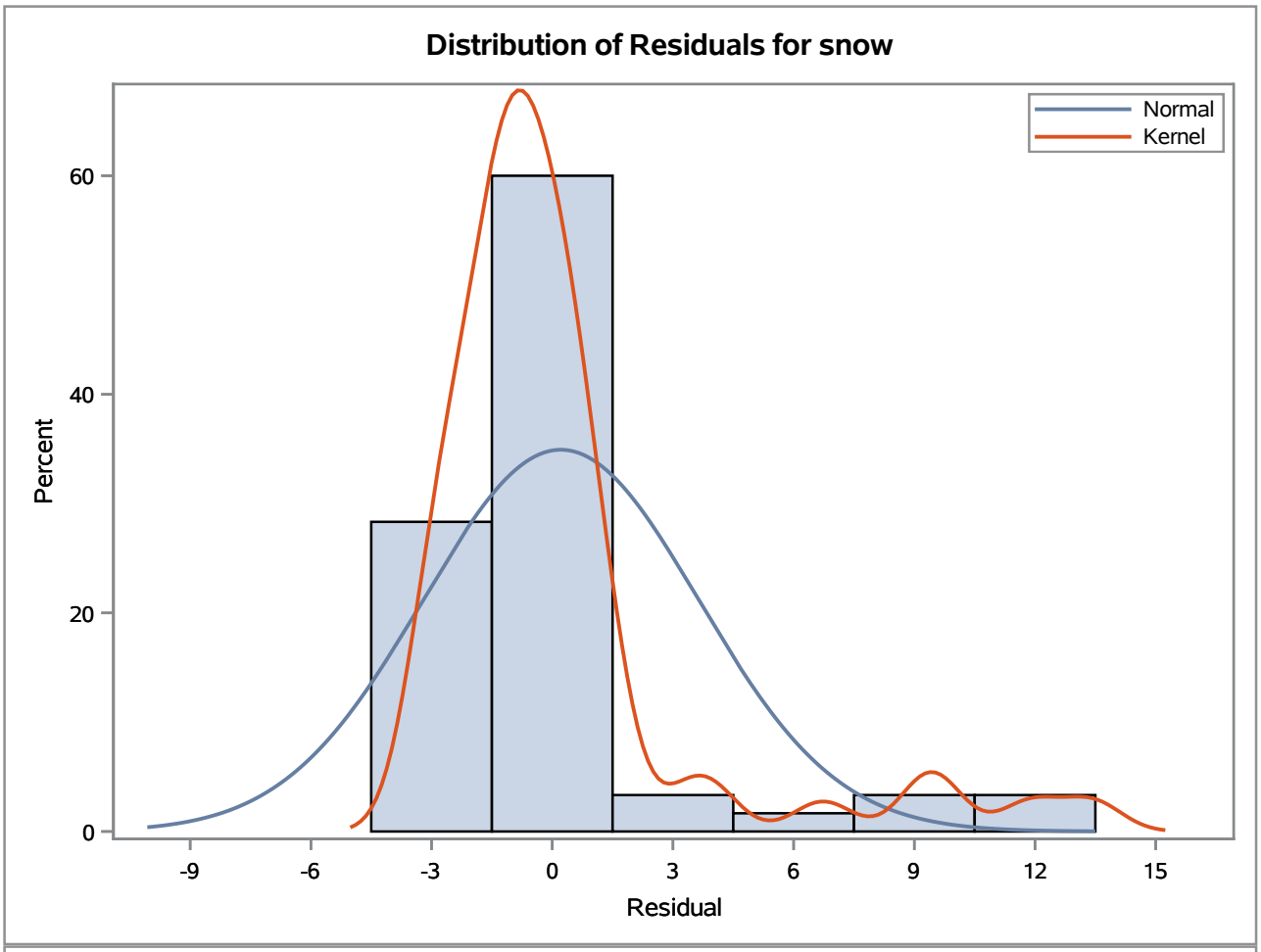
Maximum Likelihood Estimation					
Parameter	**Estimate**	**Standard Error**	**t Value**	**Approx Pr > |t|**	**Lag**
MU	1.60037	0.12561	12.74	<.0001	0
MA1,1	0.99985	38.13402	0.03	0.9791	1
AR1,1	0.97567	0.15733	6.20	<.0001	1
AR1,2	-0.0022570	0.17771	-0.01	0.9899	2
AR1,3	-0.24413	0.13595	-1.80	0.0725	3

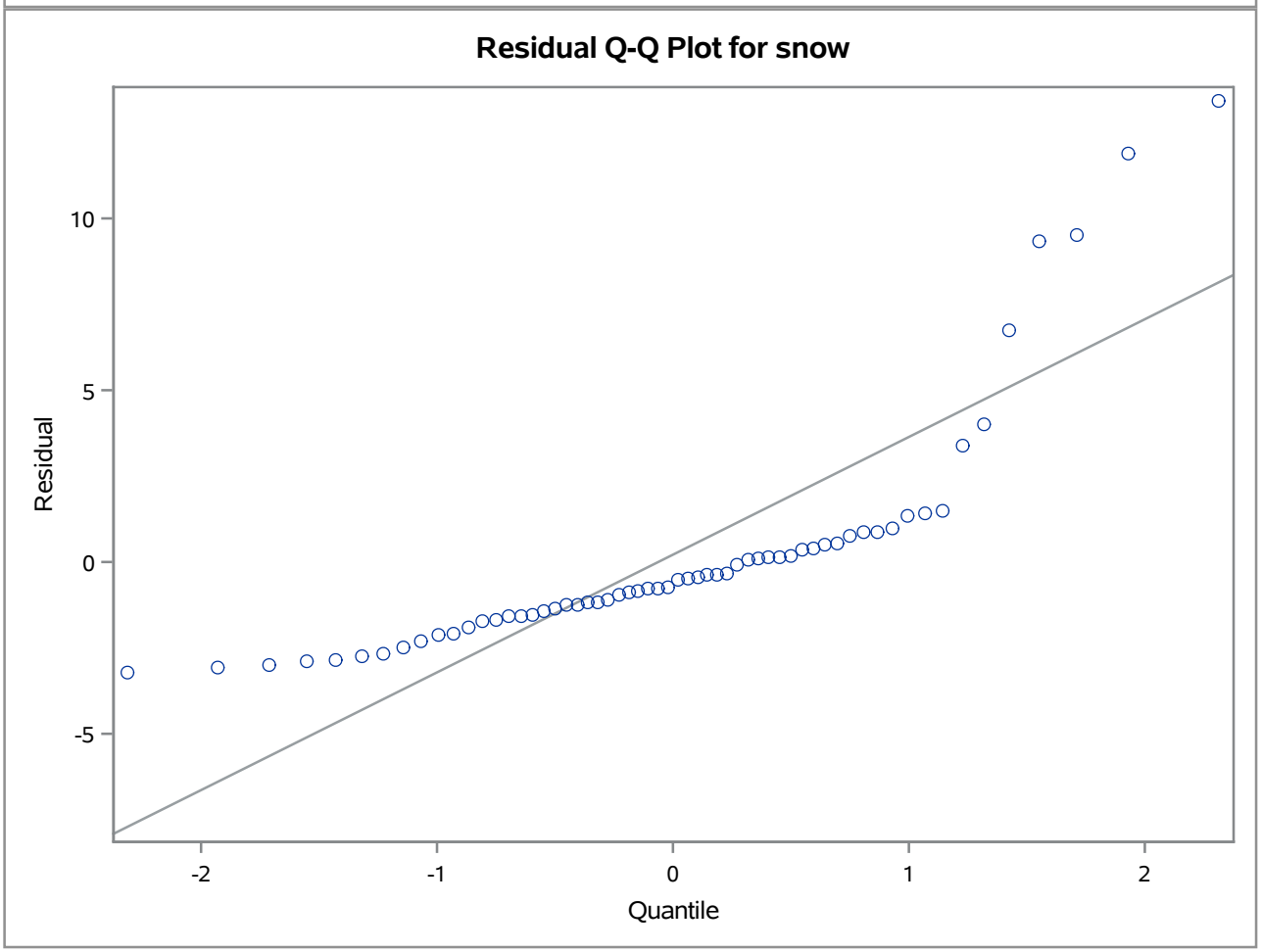
Constant Estimate	0.433252
Variance Estimate	12.64199
Std Error Estimate	3.555558
AIC	330.2604
SBC	340.7321
Number of Residuals	60

Correlations of Parameter Estimates					
Parameter	**MU**	**MA1,1**	**AR1,1**	**AR1,2**	**AR1,3**
MU	1.000	0.680	0.487	-0.063	0.158
MA1,1	0.680	1.000	0.571	-0.089	0.205
AR1,1	0.487	0.571	1.000	-0.605	0.373
AR1,2	-0.063	-0.089	-0.605	1.000	-0.724
AR1,3	0.158	0.205	0.373	-0.724	1.000

Autocorrelation Check of Residuals									
To Lag	**Chi-Square**	**DF**	**Pr > ChiSq**	**Autocorrelations**					
6	0.31	2	0.8566	-0.043	-0.034	0.028	-0.006	0.026	0.018
12	9.28	8	0.3192	-0.007	-0.025	-0.101	-0.130	0.294	-0.070
18	17.77	14	0.2174	0.255	0.052	-0.170	-0.076	-0.034	-0.041
24	24.37	20	0.2267	-0.046	-0.133	-0.165	0.144	0.023	0.026


Residual Correlation Diagnostics for snow
ACF
PACF
IACF
White Noise Prob
Lag
Residual Normality Diagnostics for snow
Distribution of Residuals
Normal
Kernel
Percent
Residual
QQ-Plot
Residual
Quantile


Distribution of Residuals for snow
Normal
Kernel
Percent
60
40
20
0
-9
-6
-3
0
3
6
9
12
15
Residual


Residual Q-Q Plot for snow
Residual
10
5
0
-5
-2
-1
0
1
2
Quantile

Model for variable snow	
Estimated Mean	1.600371

Autoregressive Factors	
Factor 1:	1 - 0.97567 B**(1) + 0.00226 B**(2) + 0.24413 B**(3)

Moving Average Factors	
Factor 1:	1 - 0.99985 B**(1)

Name of Variable = pollution	
Mean of Working Series	94.20369
Standard Deviation	27.42528
Number of Observations	60

Autocorrelation Check for White Noise									
To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	17.55	6	0.0075	0.127	-0.028	-0.041	-0.061	-0.214	-0.435
12	26.25	12	0.0099	-0.151	0.049	-0.026	-0.113	0.110	0.254

Correlation of pollution and snow	
Number of Observations	60
Variance of transformed series pollution	627.9932
Variance of transformed series snow	10.91374

Both series have been prewhitened.

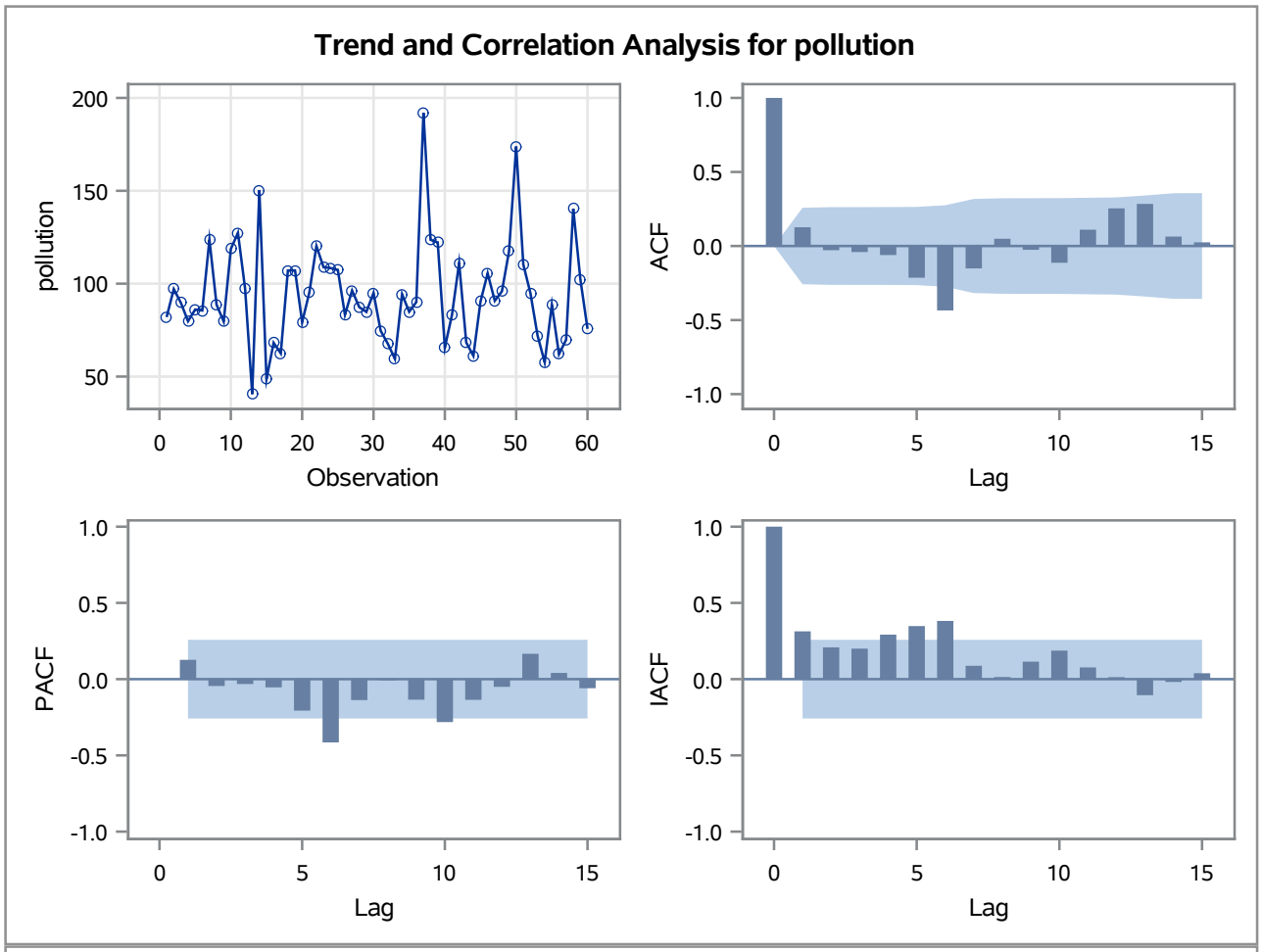
Crosscorrelation Check Between Series									
To Lag	Chi-Square	DF	Pr > ChiSq	Crosscorrelations					
5	11.64	6	0.0706	0.388	0.081	-0.097	-0.130	-0.043	0.095
11	14.49	12	0.2705	-0.054	-0.160	0.068	0.109	0.046	0.021

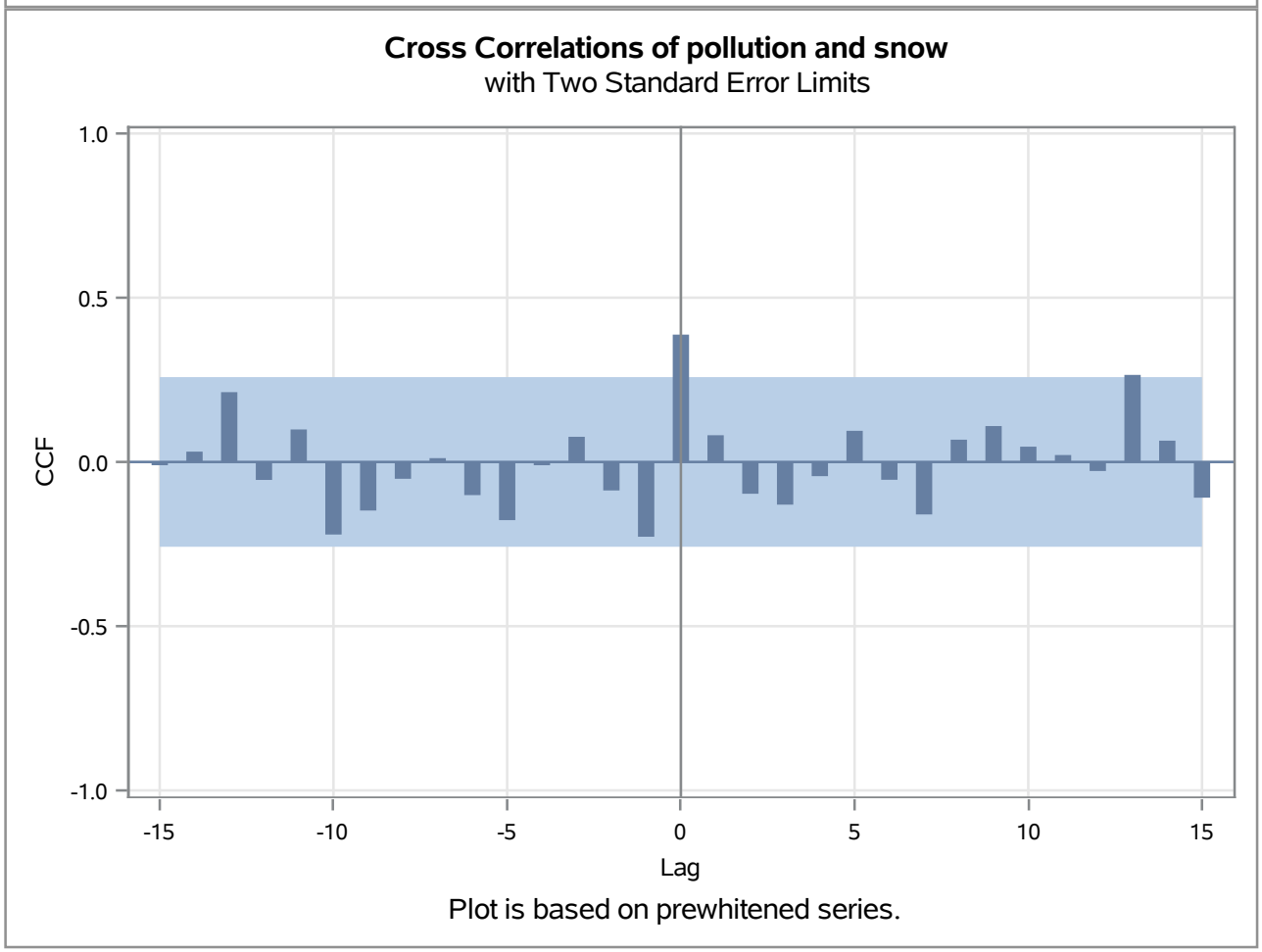
Both variables have been prewhitened by the following filter:

Prewhitening Filter

Autoregressive Factors	
Factor 1:	1 - 0.97567 B**(1) + 0.00226 B**(2) + 0.24413 B**(3)

Moving Average Factors	
Factor 1:	1 - 0.99985 B**(1)


Trend and Correlation Analysis for pollution
pollution
Observation
ACF
Lag
PACF
Lag
IACF
Lag

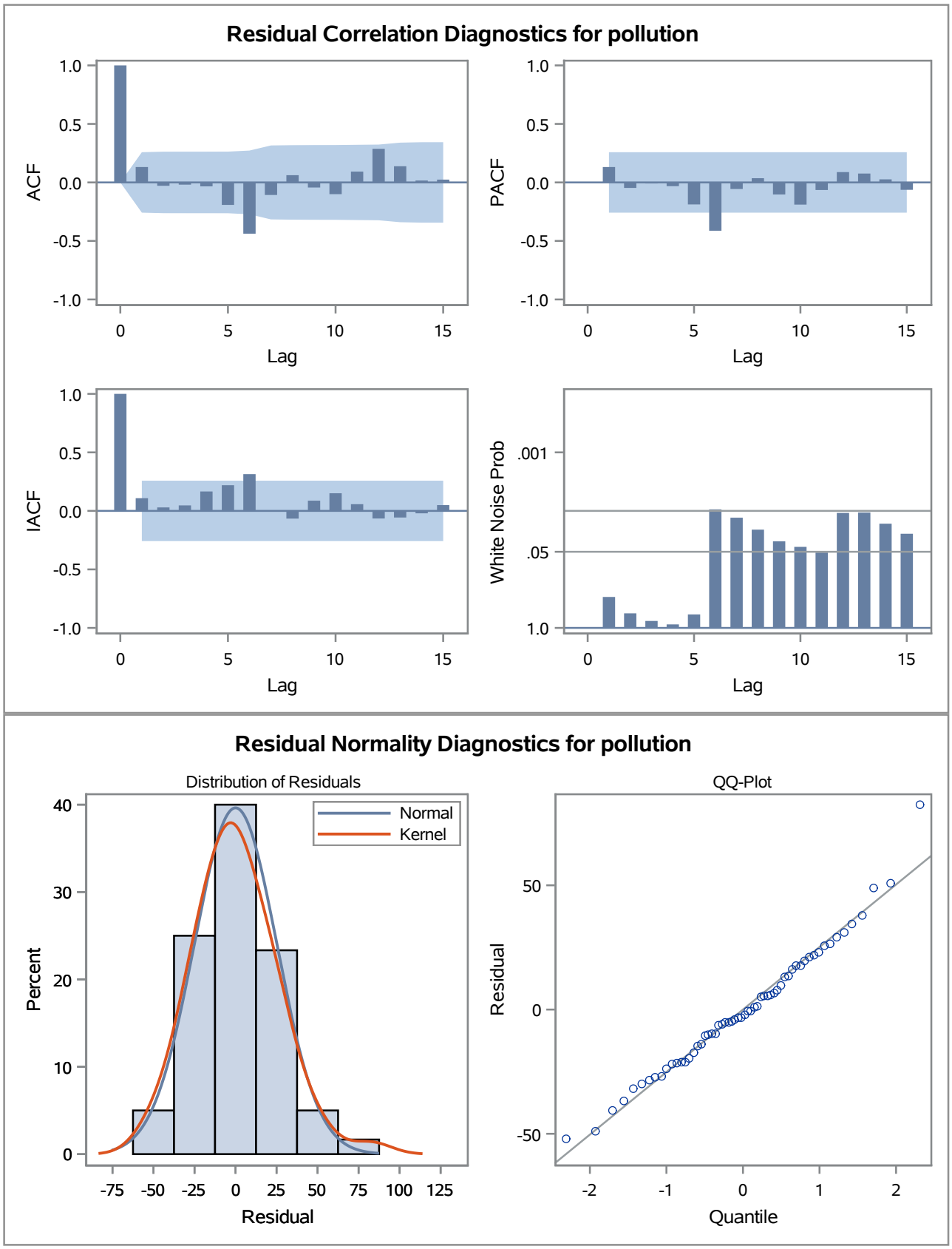

Cross Correlations of pollution and snow
with Two Standard Error Limits
CCF
Lag
Plot is based on prewhitened series.

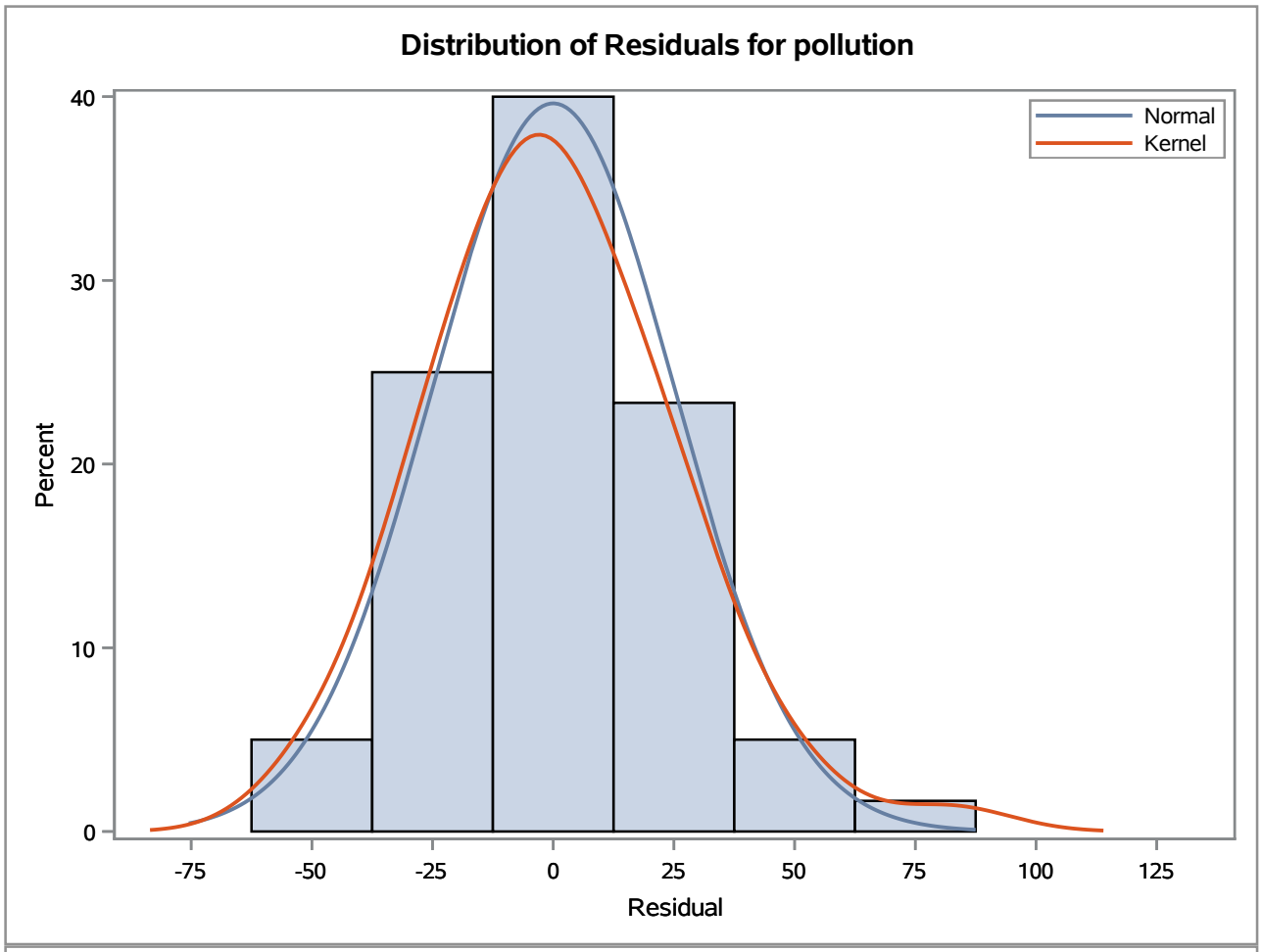
Maximum Likelihood Estimation							
Parameter	Estimate	Standard Error	t Value	Approx Pr > |t|	Lag	Variable	Shift
MU	89.38657	3.55780	25.12	<.0001	0	pollution	0
NUM1	3.00158	0.86410	3.47	0.0005	0	snow	0

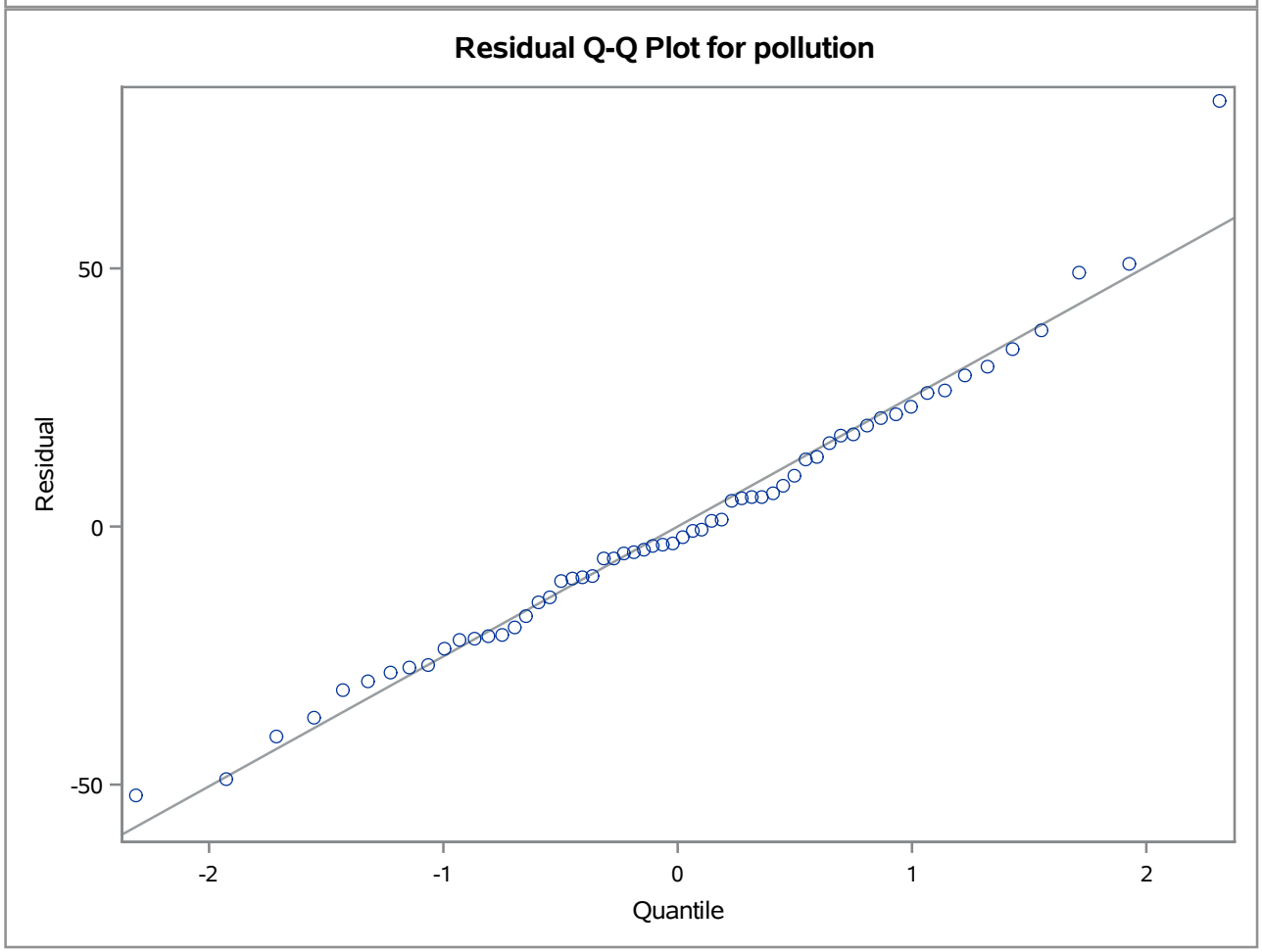
Constant Estimate	89.38657
Variance Estimate	644.0877
Std Error Estimate	25.37888
AIC	560.3086
SBC	564.4973
Number of Residuals	60

Correlations of Parameter Estimates			
Variable	Parameter	pollution MU	snow NUM1
pollution	MU	1.000	-0.390
snow	NUM1	-0.390	1.000

Autocorrelation Check of Residuals									
To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	16.96	6	0.0094	0.132	-0.029	-0.019	-0.034	-0.192	-0.438
12	25.97	12	0.0108	-0.107	0.062	-0.043	-0.100	0.092	0.287
18	31.02	18	0.0286	0.138	0.016	0.024	0.114	-0.139	-0.090
24	37.64	24	0.0378	-0.001	0.026	0.010	-0.252	0.023	-0.052


Residual Correlation Diagnostics for pollution
ACF
PACF
IACF
White Noise Prob
Lag
Residual Normality Diagnostics for pollution
Distribution of Residuals
Normal
Kernel
Percent
Residual
QQ-Plot
Residual
Quantile


Distribution of Residuals for pollution
Normal
Kernel
Percent
40
30
20
10
0
-75
-50
-25
0
25
50
75
100
125
Residual


Residual Q-Q Plot for pollution
Residual
50
0
-50
-2
-1
0
1
2
Quantile

Crosscorrelation Check of Residuals with Input snow									
To Lag	Chi-Square	DF	Pr > ChiSq	Crosscorrelations					
5	2.41	6	0.8785	-0.014	0.100	-0.060	-0.129	-0.053	0.084
11	7.00	12	0.8574	-0.027	-0.123	0.089	0.172	0.135	-0.071
17	8.87	18	0.9627	-0.019	0.119	-0.010	-0.077	-0.095	-0.042
23	14.38	24	0.9376	-0.094	-0.125	0.022	0.092	0.033	0.239

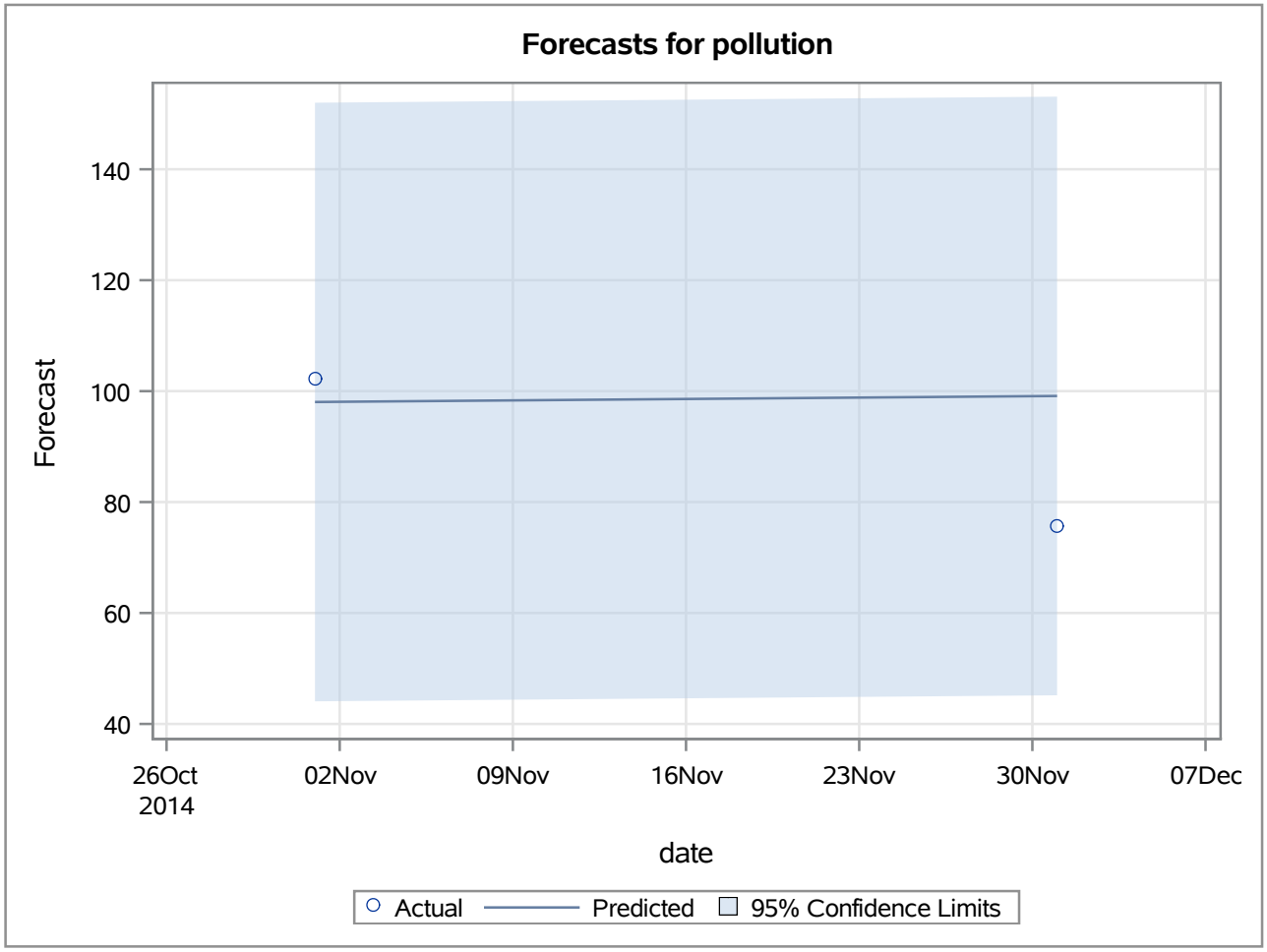
Model for variable pollution	
Estimated Intercept	89.38657

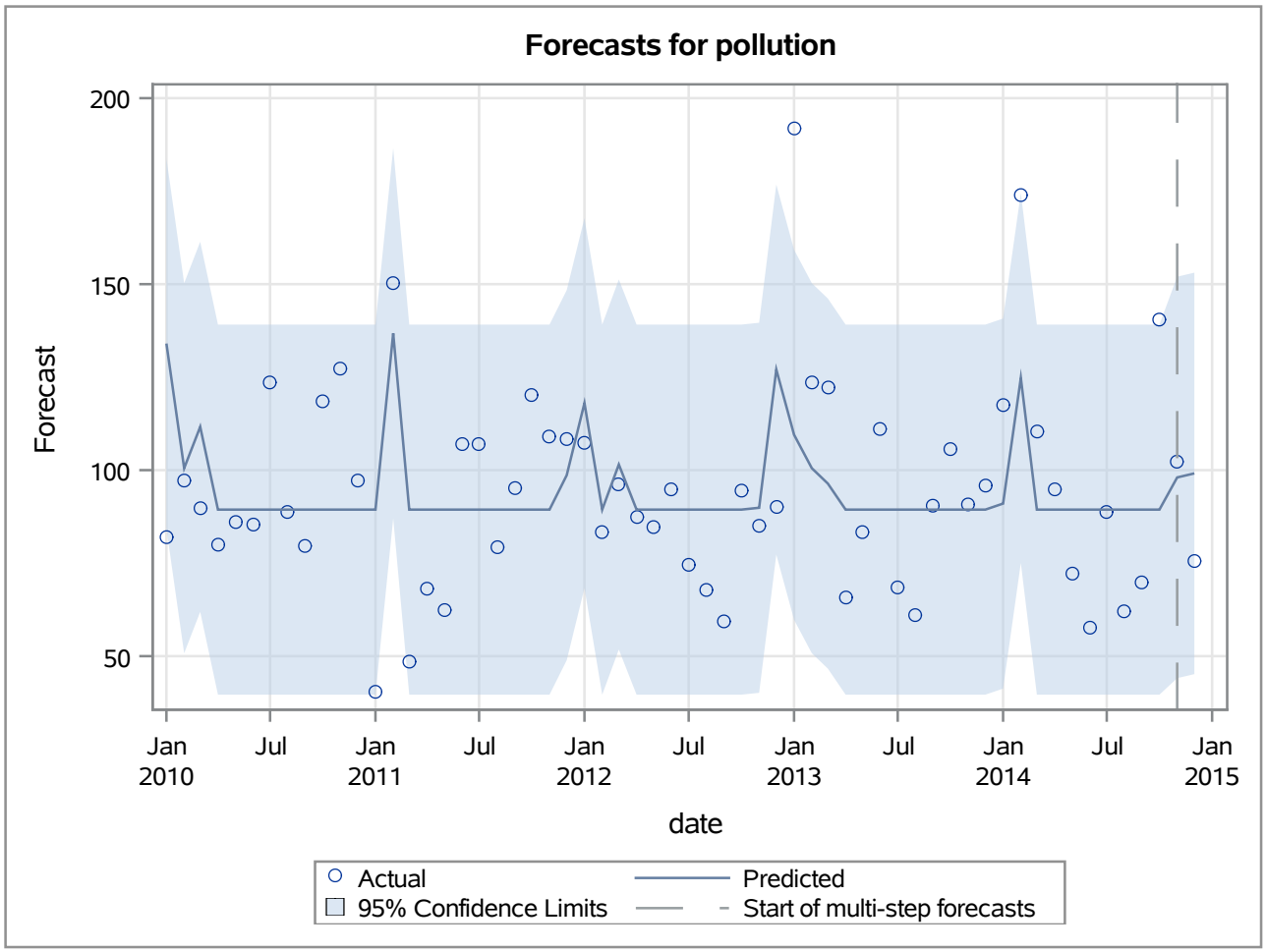
Input Number 1	
Input Variable	snow
Overall Regression Factor	3.001579

Forecasts for variable pollution						
Obs	Forecast	Std Error	95% Confidence Limits		Actual	Residual
1	134.0351	25.3789	84.2934	183.7768	82.0264	-52.0087
2	100.5174	25.3789	50.7757	150.2591	97.0893	-3.4281
3	111.6483	25.3789	61.9066	161.3900	89.6734	-21.9749
4	89.3866	25.3789	39.6449	139.1283	79.8069	-9.5796
5	89.3866	25.3789	39.6449	139.1283	86.0820	-3.3046
6	89.3866	25.3789	39.6449	139.1283	85.5375	-3.8491
7	89.3866	25.3789	39.6449	139.1283	123.6478	34.2613
8	89.3866	25.3789	39.6449	139.1283	88.6815	-0.7051
9	89.3866	25.3789	39.6449	139.1283	79.6319	-9.7546
10	89.3866	25.3789	39.6449	139.1283	118.6626	29.2761
11	89.3866	25.3789	39.6449	139.1283	127.3778	37.9912
12	89.3866	25.3789	39.6449	139.1283	97.3333	7.9468
13	89.3866	25.3789	39.6449	139.1283	40.5470	-48.8395
14	136.7865	25.3789	87.0448	186.5282	150.3214	13.5349
15	89.3866	25.3789	39.6449	139.1283	48.6546	-40.7320
16	89.3866	25.3789	39.6449	139.1283	68.1806	-21.2060
17	89.3866	25.3789	39.6449	139.1283	62.5121	-26.8745
18	89.3866	25.3789	39.6449	139.1283	107.1111	17.7245
19	89.3866	25.3789	39.6449	139.1283	107.1384	17.7519
20	89.3866	25.3789	39.6449	139.1283	79.2366	-10.1500
21	89.3866	25.3789	39.6449	139.1283	95.1403	5.7537
22	89.3866	25.3789	39.6449	139.1283	120.2406	30.8540

Forecasts for variable pollution						
Obs	Forecast	Std Error	95% Confidence Limits		Actual	Residual
23	89.3866	25.3789	39.6449	139.1283	108.8708	19.4843
24	98.6414	25.3789	48.8997	148.3831	108.3737	9.7322
25	118.0266	25.3789	68.2849	167.7683	107.4435	-10.5831
26	89.3866	25.3789	39.6449	139.1283	83.2730	-6.1136
27	101.5180	25.3789	51.7763	151.2597	96.3360	-5.1819
28	89.3866	25.3789	39.6449	139.1283	87.3972	-1.9893
29	89.3866	25.3789	39.6449	139.1283	84.7782	-4.6083
30	89.3866	25.3789	39.6449	139.1283	94.9861	5.5995
31	89.3866	25.3789	39.6449	139.1283	74.6707	-14.7159
32	89.3866	25.3789	39.6449	139.1283	67.7137	-21.6729
33	89.3866	25.3789	39.6449	139.1283	59.5014	-29.8852
34	89.3866	25.3789	39.6449	139.1283	94.3293	4.9427
35	89.8868	25.3789	40.1451	139.6285	84.8806	-5.0063
36	127.0314	25.3789	77.2897	176.7731	90.1169	-36.9144
37	109.5222	25.3789	59.7805	159.2639	191.9745	82.4523
38	100.5174	25.3789	50.7757	150.2591	123.6176	23.1001
39	96.3903	25.3789	46.6486	146.1320	122.2379	25.8476
40	89.3866	25.3789	39.6449	139.1283	65.6542	-23.7324
41	89.3866	25.3789	39.6449	139.1283	83.1801	-6.2065
42	89.3866	25.3789	39.6449	139.1283	111.1069	21.7204
43	89.3866	25.3789	39.6449	139.1283	68.3347	-21.0519
44	89.3866	25.3789	39.6449	139.1283	61.1586	-28.2280
45	89.3866	25.3789	39.6449	139.1283	90.3694	0.9829
46	89.3866	25.3789	39.6449	139.1283	105.5901	16.2035
47	89.3866	25.3789	39.6449	139.1283	90.7931	1.4065
48	89.3866	25.3789	39.6449	139.1283	95.8629	6.4763
49	91.0124	25.3789	41.2707	140.7541	117.4422	26.4298
50	124.7802	25.3789	75.0385	174.5219	173.8378	49.0576
51	89.3866	25.3789	39.6449	139.1283	110.3374	20.9508
52	89.3866	25.3789	39.6449	139.1283	94.8361	5.4495
53	89.3866	25.3789	39.6449	139.1283	72.0605	-17.3261
54	89.3866	25.3789	39.6449	139.1283	57.6875	-31.6991
55	89.3866	25.3789	39.6449	139.1283	88.6142	-0.7723
56	89.3866	25.3789	39.6449	139.1283	62.0121	-27.3745
57	89.3866	25.3789	39.6449	139.1283	69.8056	-19.5810
58	89.3866	25.3789	39.6449	139.1283	140.3669	50.9804

Forecasts for variable pollution						
Obs	Forecast	Std Error	95% Confidence Limits		Actual	Residual
59	98.0395	27.5315	44.0787	152.0003	102.3486	4.3091
60	99.1294	27.5327	45.1662	153.0926	75.6882	-23.4412





Outlier Detection Summary	
Maximum number searched	2
Number found	2
Significance used	0.05

Outlier Details

Obs	Type	Estimate	Chi-Square	Approx Prob>ChiSq
37	Additive	82.45230	9.75	0.0018
1	Additive	-52.00868	4.06	0.0439