

# Model Statistics, Data, and Plots

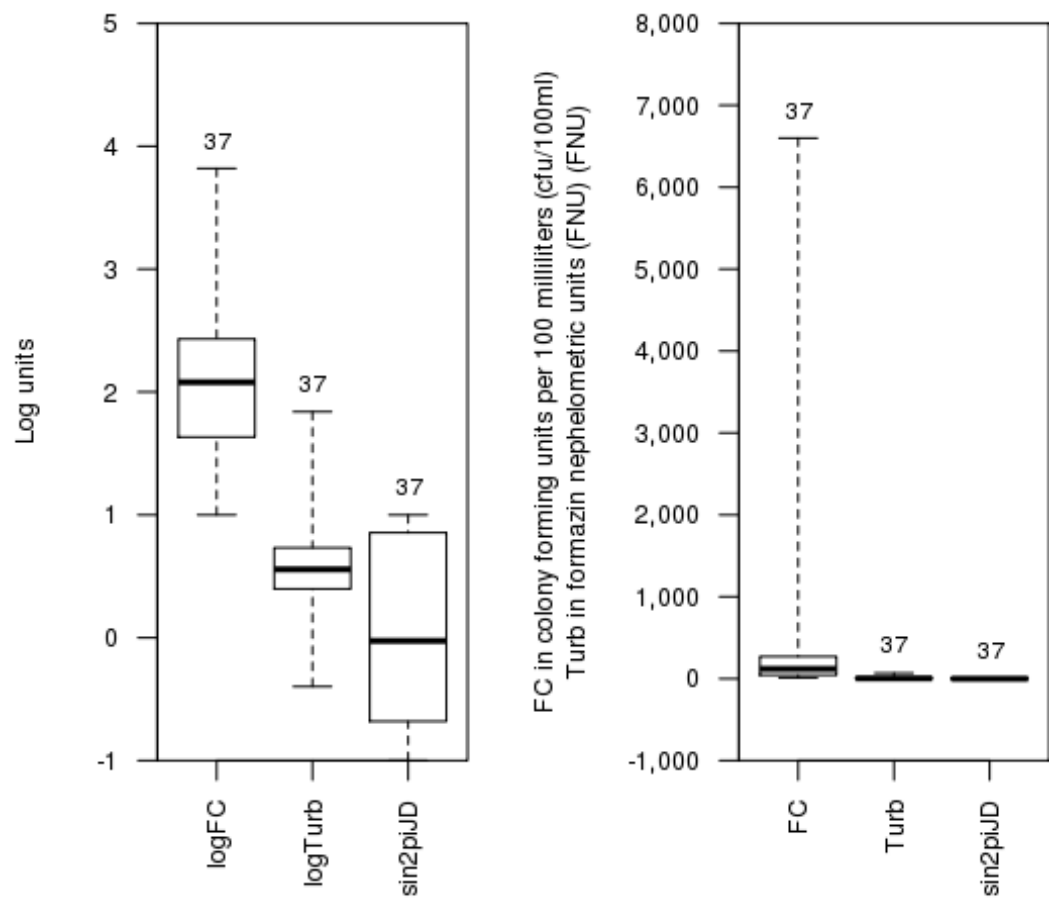
## Model

$\text{logFC} = + 1.25 * \text{logTurb} - 0.543 * \text{sin2piJD} + 1.4$

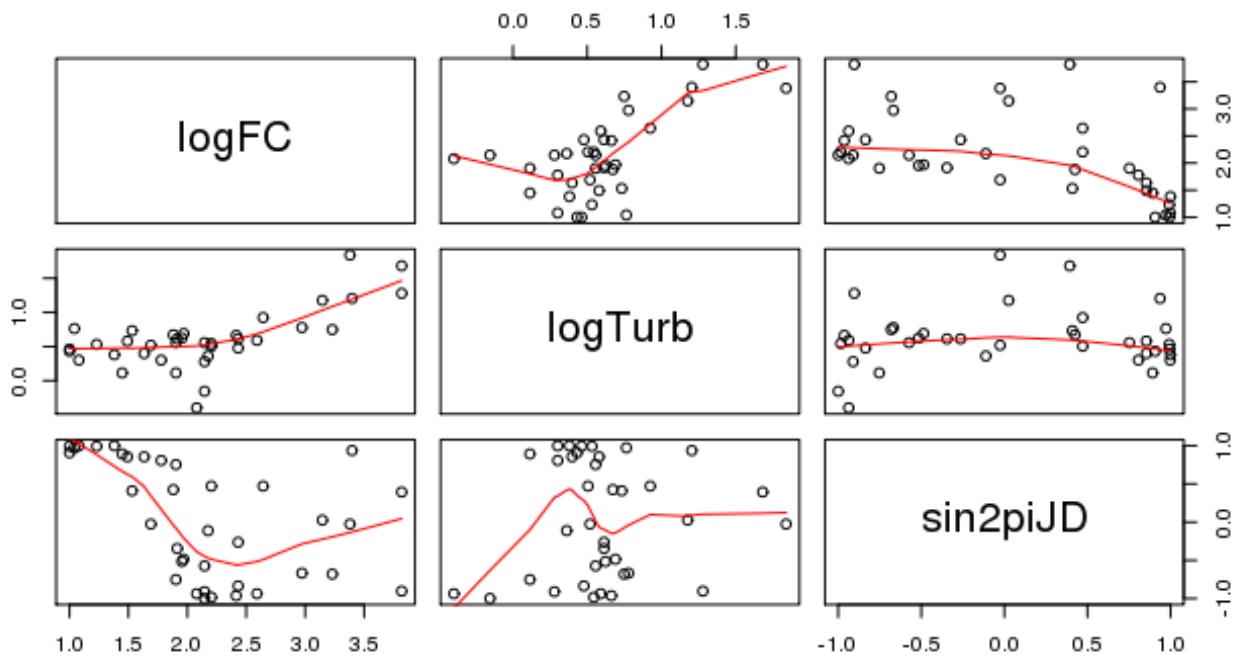
## Variable Summary Statistics

|              | logFC | FC   | logTurb | sin2piJD | Turb  |
|--------------|-------|------|---------|----------|-------|
| Minimum      | 1.00  | 10   | -0.398  | -1.0000  | 0.40  |
| 1st Quartile | 1.63  | 43   | 0.398   | -0.6810  | 2.50  |
| Median       | 2.08  | 120  | 0.556   | -0.0258  | 3.60  |
| Mean         | 2.14  | 692  | 0.607   | 0.0334   | 7.53  |
| 3rd Quartile | 2.43  | 270  | 0.732   | 0.8540   | 5.40  |
| Maximum      | 3.82  | 6600 | 1.840   | 1.0000   | 69.00 |

Box Plots



## Exploratory Plots



## Basic Model Statistics

```

Number of Observations              37
Standard error (RMSE)                0.423
Average Model standard percentage error (MSPE)  114
Coefficient of determination (R2)        0.708
Adjusted Coefficient of Determination (Adj. R2) 0.691
Bias Correction Factor (BCF)         1.56

Variance Inflation Factors (VIF)
  logTurb sin2piJD
    1.01    1.01

```

## Explanatory Variables

|             | Coefficients | Standard Error | t value | Pr(> t ) |
|-------------|--------------|----------------|---------|----------|
| (Intercept) | 1.400        | 0.1220         | 11.50   | 2.72e-13 |
| logTurb     | 1.250        | 0.1650         | 7.54    | 9.25e-09 |
| sin2piJD    | -0.543       | 0.0939         | -5.78   | 1.66e-06 |

## Correlation Matrix

|           | Intercept | logTurb | sin2piJD |
|-----------|-----------|---------|----------|
| Intercept | 1.0000    | -0.8200 | 0.0558   |

|          |         |         |         |
|----------|---------|---------|---------|
| logTurb  | -0.8200 | 1.0000  | -0.0991 |
| sin2piJD | 0.0558  | -0.0991 | 1.0000  |

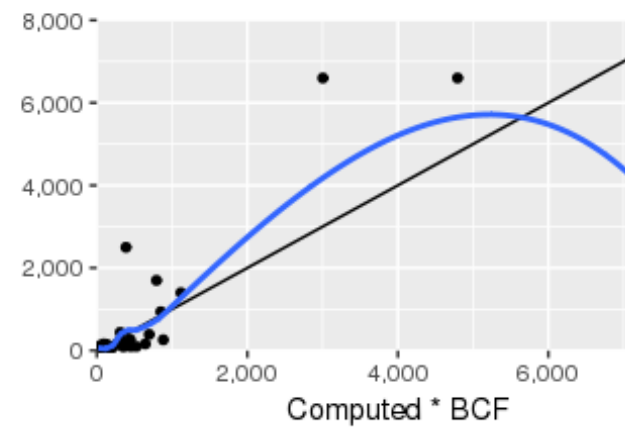
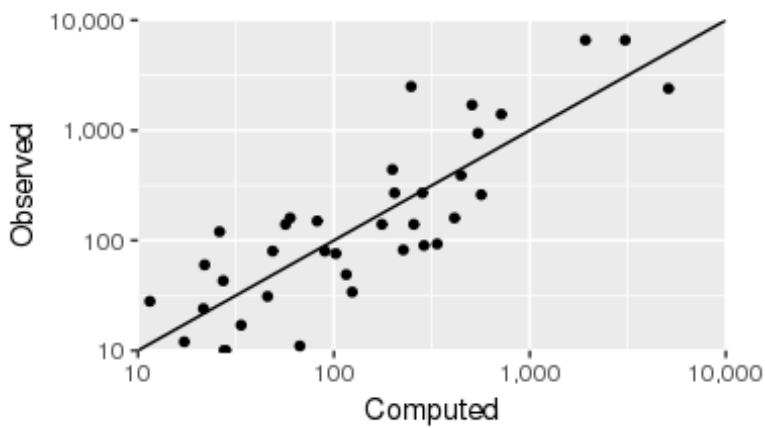
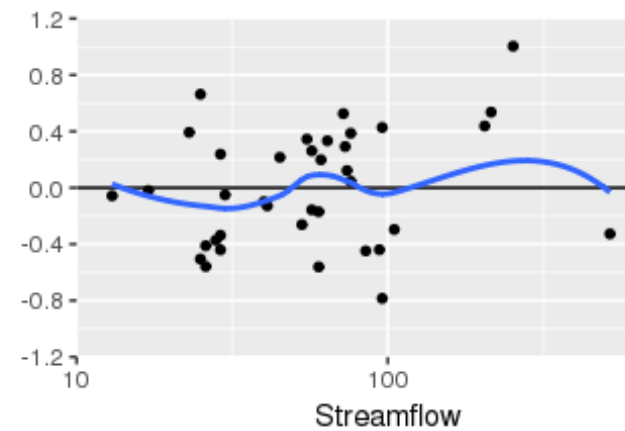
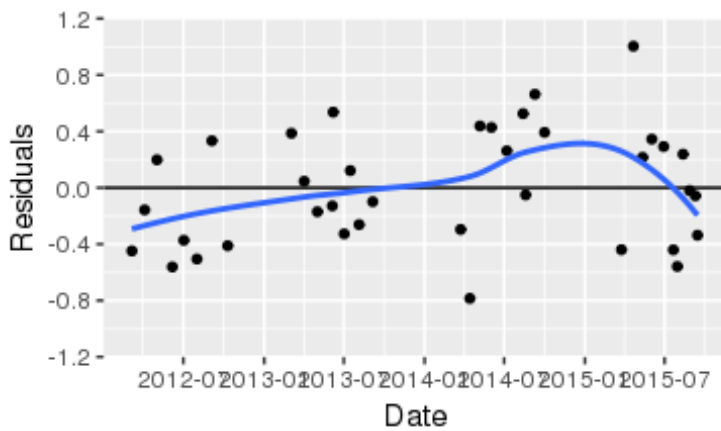
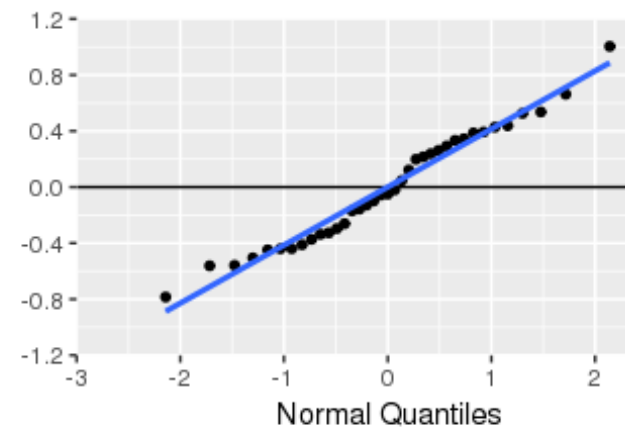
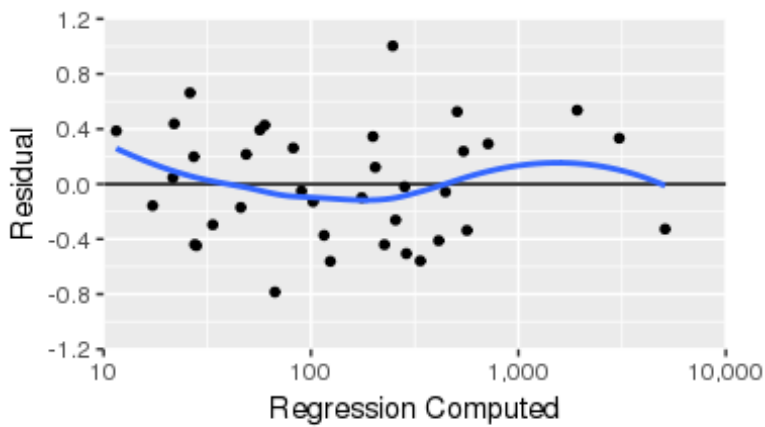
## Outlier Test Criteria

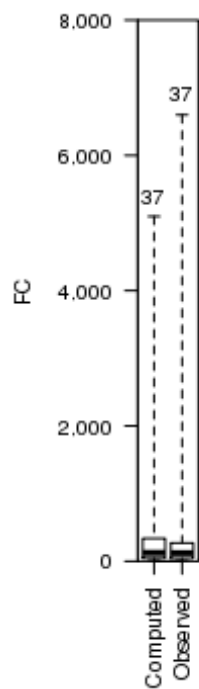
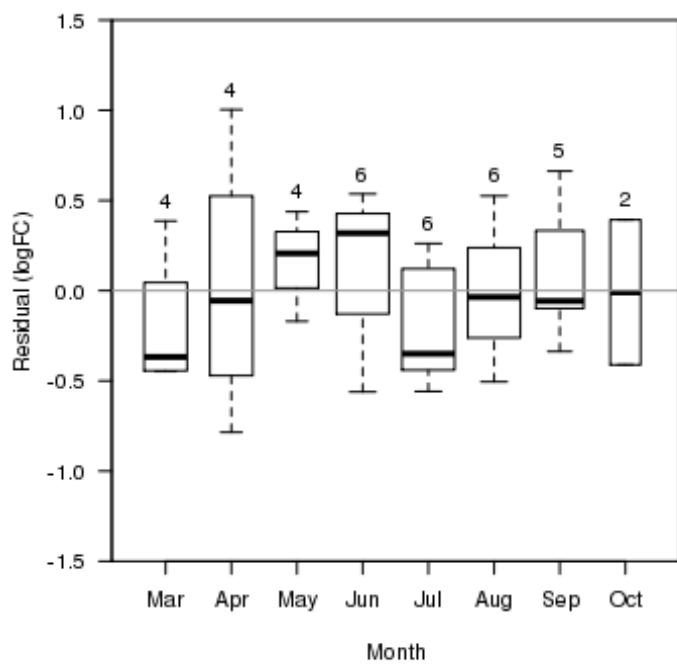
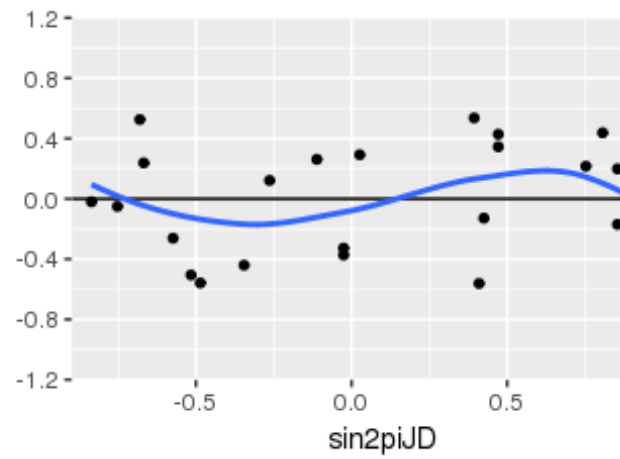
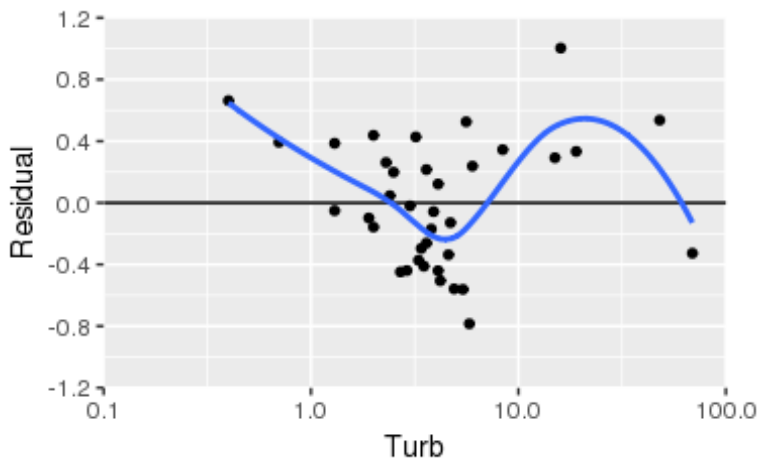
|          |          |        |
|----------|----------|--------|
| Leverage | Cook's D | DFFITS |
| 0.162    | 0.194    | 0.465  |

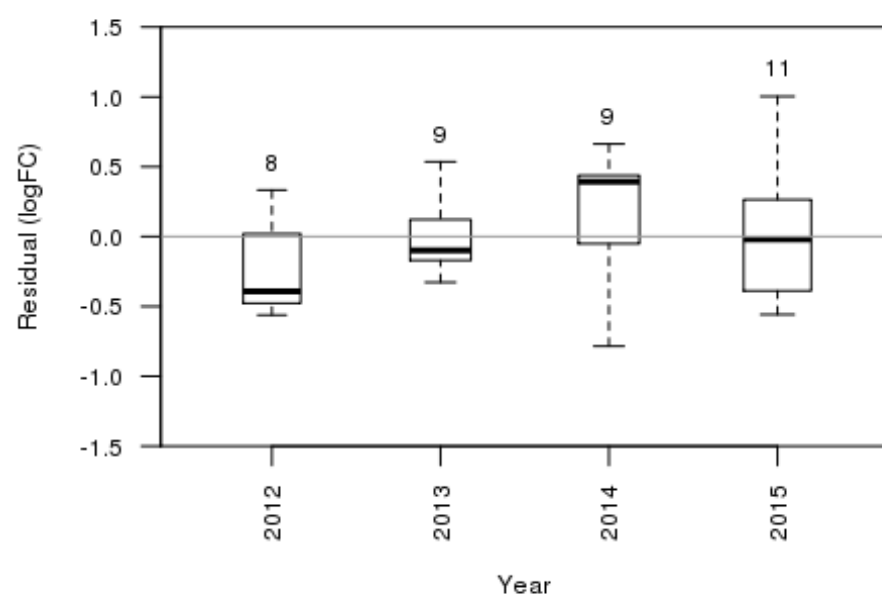
## Flagged Observations

|                  | logFC    | Estimate | Residual | Standard | Residual | Studentized |
|------------------|----------|----------|----------|----------|----------|-------------|
| Residual         | Leverage | Cook's D | DFFITS   |          |          |             |
| 06/07/2013 09:00 | 3.82     | 3.28     | 0.536    |          | 1.420    |             |
| 1.440            | 0.2020   | 0.1700   | 0.726    |          |          |             |
| 07/02/2013 09:45 | 3.38     | 3.71     | -0.327   |          | -0.898   | -           |
| 0.896            | 0.2590   | 0.0942   | -0.530   |          |          |             |
| 04/14/2014 08:45 | 1.04     | 1.83     | -0.785   |          | -1.920   | -           |
| 2.010            | 0.0717   | 0.0953   | -0.558   |          |          |             |
| 09/09/2014 08:15 | 2.08     | 1.42     | 0.663    |          | 1.760    |             |
| 1.820            | 0.2100   | 0.2760   | 0.940    |          |          |             |
| 04/21/2015 12:45 | 3.40     | 2.39     | 1.000    |          | 2.520    |             |
| 2.750            | 0.1120   | 0.2670   | 0.978    |          |          |             |

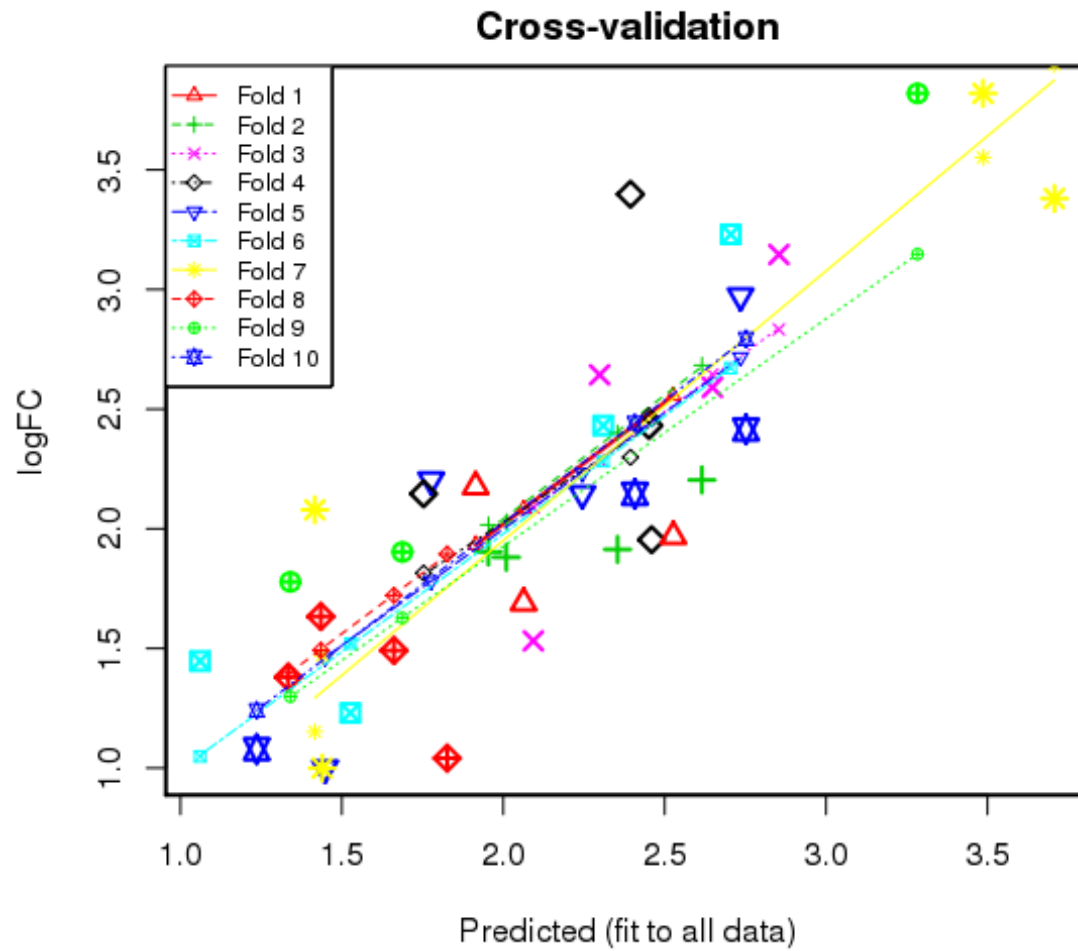
## Statistical Plots



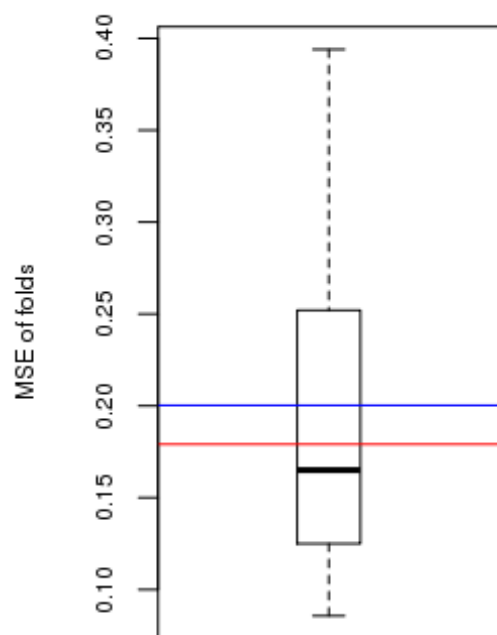




## Cross Validation



Minimum MSE of folds: 0.0857  
Mean MSE of folds: 0.2000  
Median MSE of folds: 0.1650  
Maximum MSE of folds: 0.3940  
(Mean MSE of folds) / (Model MSE): 1.1200



Red line - Model MSE

Blue line - Mean MSE of folds

## Model-Calibration Data Set

|           | Date       | logFC | logTurb | sin2piJD | FC | Turb | Computed | Computed | Residual |
|-----------|------------|-------|---------|----------|----|------|----------|----------|----------|
| Normal    | Censored   |       |         |          |    |      |          |          |          |
| 0         |            |       |         |          |    |      | logFC    | FC       |          |
| Quantiles | Values     |       |         |          |    |      |          |          |          |
| 1         | 2012-03-06 | 1     | 0.431   | 0.907    | 10 | 2.7  | 1.45     | 43.9     | -0.448   |
| -1.16     | --         |       |         |          |    |      |          |          |          |
| 2         | 2012-04-04 | 1.08  | 0.301   | 0.998    | 12 | 2    | 1.24     | 27       | -0.157   |
| -0.273    | --         |       |         |          |    |      |          |          |          |
| 3         | 2012-05-02 | 1.63  | 0.398   | 0.854    | 43 | 2.5  | 1.43     | 42.6     | 0.199    |
| 0.273     | --         |       |         |          |    |      |          |          |          |
| 4         | 2012-06-06 | 1.53  | 0.732   | 0.409    | 34 | 5.4  | 2.09     | 194      | -0.562   |
| -1.72     | --         |       |         |          |    |      |          |          |          |

|        |            |      |        |         |      |     |      |      |         |
|--------|------------|------|--------|---------|------|-----|------|------|---------|
| 5      | 2012-07-02 | 1.69 | 0.519  | -0.0258 | 49   | 3.3 | 2.06 | 181  | -0.373  |
| -0.735 | --         |      |        |         |      |     |      |      |         |
| 6      | 2012-08-01 | 1.95 | 0.623  | -0.516  | 90   | 4.2 | 2.46 | 451  | -0.505  |
| -1.3   | --         |      |        |         |      |     |      |      |         |
| 7      | 2012-09-04 | 3.82 | 1.28   | -0.903  | 6600 | 19  | 3.49 | 4790 | 0.333   |
| 0.649  | --         |      |        |         |      |     |      |      |         |
| 8      | 2012-10-10 | 2.2  | 0.544  | -0.984  | 160  | 3.5 | 2.62 | 645  | -0.411  |
| -0.826 | --         |      |        |         |      |     |      |      |         |
| 9      | 2013-03-04 | 1.45 | 0.114  | 0.892   | 28   | 1.3 | 1.06 | 18   | 0.386   |
| 0.826  | --         |      |        |         |      |     |      |      |         |
| 10     | 2013-04-02 | 1.38 | 0.38   | 1       | 24   | 2.4 | 1.33 | 33.8 | 0.0462  |
| 0.135  | --         |      |        |         |      |     |      |      |         |
| 11     | 2013-05-02 | 1.49 | 0.58   | 0.854   | 31   | 3.8 | 1.66 | 71.7 | -0.17   |
| -0.344 | --         |      |        |         |      |     |      |      |         |
| 12     | 2013-06-05 | 1.88 | 0.672  | 0.425   | 76   | 4.7 | 2.01 | 160  | -0.129  |
| -0.204 | --         |      |        |         |      |     |      |      |         |
| 13     | 2013-06-07 | 3.82 | 1.68   | 0.394   | 6600 | 48  | 3.28 | 3000 | 0.536   |
| 1.48   | --         |      |        |         |      |     |      |      |         |
| 14     | 2013-07-02 | 3.38 | 1.84   | -0.0258 | 2400 | 69  | 3.71 | 7970 | -0.327  |
| -0.568 | --         |      |        |         |      |     |      |      |         |
| 15     | 2013-07-16 | 2.43 | 0.613  | -0.264  | 270  | 4.1 | 2.31 | 319  | 0.122   |
| 0.204  | --         |      |        |         |      |     |      |      |         |
| 16     | 2013-08-05 | 2.15 | 0.556  | -0.574  | 140  | 3.6 | 2.41 | 400  | -0.261  |
| -0.416 | --         |      |        |         |      |     |      |      |         |
| 17     | 2013-09-05 | 2.15 | 0.279  | -0.911  | 140  | 1.9 | 2.24 | 275  | -0.0987 |
| -0.135 | --         |      |        |         |      |     |      |      |         |
| 18     | 2014-03-24 | 1.23 | 0.531  | 0.992   | 17   | 3.4 | 1.53 | 52.6 | -0.296  |
| -0.491 | --         |      |        |         |      |     |      |      |         |
| 19     | 2014-04-14 | 1.04 | 0.763  | 0.972   | 11   | 5.8 | 1.83 | 105  | -0.785  |
| -2.14  | --         |      |        |         |      |     |      |      |         |
| 20     | 2014-05-07 | 1.78 | 0.301  | 0.806   | 60   | 2   | 1.34 | 34.2 | 0.438   |
| 1.16   | --         |      |        |         |      |     |      |      |         |
| 21     | 2014-06-02 | 2.2  | 0.505  | 0.471   | 160  | 3.2 | 1.78 | 93.5 | 0.428   |
| 1.03   | --         |      |        |         |      |     |      |      |         |
| 22     | 2014-07-07 | 2.18 | 0.362  | -0.112  | 150  | 2.3 | 1.91 | 128  | 0.262   |
| 0.491  | --         |      |        |         |      |     |      |      |         |
| 23     | 2014-08-13 | 3.23 | 0.748  | -0.681  | 1700 | 5.6 | 2.7  | 793  | 0.526   |
| 1.3    | --         |      |        |         |      |     |      |      |         |
| 24     | 2014-08-19 | 1.9  | 0.114  | -0.753  | 80   | 1.3 | 1.95 | 141  | -0.0508 |
| 0      | --         |      |        |         |      |     |      |      |         |
| 25     | 2014-09-09 | 2.08 | -0.398 | -0.937  | 120  | 0.4 | 1.42 | 40.8 | 0.663   |
| 1.72   | --         |      |        |         |      |     |      |      |         |
| 26     | 2014-10-01 | 2.15 | -0.155 | -1      | 140  | 0.7 | 1.75 | 88.6 | 0.393   |
| 0.925  | --         |      |        |         |      |     |      |      |         |
| 27     | 2015-03-25 | 1    | 0.462  | 0.994   | 10   | 2.9 | 1.44 | 43   | -0.439  |
| -0.925 | --         |      |        |         |      |     |      |      |         |
| 28     | 2015-04-21 | 3.4  | 1.2    | 0.937   | 2500 | 16  | 2.39 | 388  | 1       |
| 2.14   | --         |      |        |         |      |     |      |      |         |
| 29     | 2015-05-12 | 1.9  | 0.556  | 0.753   | 80   | 3.6 | 1.69 | 76.2 | 0.216   |
| 0.344  | --         |      |        |         |      |     |      |      |         |

|         |            |      |       |        |      |     |      |      |        |
|---------|------------|------|-------|--------|------|-----|------|------|--------|
| 30      | 2015-06-02 | 2.64 | 0.924 | 0.471  | 440  | 8.4 | 2.3  | 311  | 0.345  |
| 0.735   | --         |      |       |        |      |     |      |      |        |
| 31      | 2015-06-29 | 3.15 | 1.18  | 0.0258 | 1400 | 15  | 2.85 | 1120 | 0.292  |
| 0.568   | --         |      |       |        |      |     |      |      |        |
| 32      | 2015-07-21 | 1.91 | 0.613 | -0.346 | 82   | 4.1 | 2.35 | 354  | -0.44  |
| -1.03   | --         |      |       |        |      |     |      |      |        |
| 33      | 2015-07-30 | 1.97 | 0.69  | -0.486 | 93   | 4.9 | 2.53 | 526  | -0.558 |
| -1.48   | --         |      |       |        |      |     |      |      |        |
| 34      | 2015-08-12 | 2.97 | 0.778 | -0.668 | 940  | 6   | 2.74 | 850  | 0.238  |
| 0.416   | --         |      |       |        |      |     |      |      |        |
| 35      | 2015-08-27 | 2.43 | 0.477 | -0.836 | 270  | 3   | 2.45 | 442  | -0.02  |
| 0.0674  | --         |      |       |        |      |     |      |      |        |
| 36      | 2015-09-09 | 2.59 | 0.591 | -0.937 | 390  | 3.9 | 2.65 | 696  | -0.057 |
| -0.0674 | --         |      |       |        |      |     |      |      |        |
| 37      | 2015-09-14 | 2.41 | 0.663 | -0.963 | 260  | 4.6 | 2.75 | 883  | -0.337 |
| -0.649  | --         |      |       |        |      |     |      |      |        |

## Definitions

FC: Fecal coliforms in cfu/100ml (31625)

Turb: Turbidity in FNU (63680)

DY: Date in decimal years

App Version 1.0