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Validation of the Atmospheric Transport Model: Comparison of Observed Krypton-85 Concentrations with Those Computed Using a Gaussian Plume Model

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ABSTRACT

Thirty monthly average ^{85}Kr concentrations measured at 13 sampling locations between 25 and 150 km from a quasi-continuous point source were used in a validation study of the Atmospheric Transport Model for Toxic Substances (ATM-TOX). Although the computed values tended to overestimate, more than 60% of them fell within a factor of 2 of the observed concentrations.

INTRODUCTION

The ATM-TOX was developed(1,2) at the Oak Ridge National Laboratory (ORNL) to study a variety of air quality problems. ATM-TOX is a typical Gaussian plume model which has been used to compute ground-level concentrations and depositions of gaseous and particulate material. The model contains most of

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the features found in similar computer codes. These include a wind profile, afternoon and nocturnal mixing heights, wetfall and dryfall deposition, a tilting plume for heavy particles, plume rise from point sources due to momentum or buoyancy, and a first-order reaction rate. A joint frequency distribution of wind speed, wind direction and stability class is required as input data. These data can be for any time period but are generally monthly, seasonal, or annual averages. Two different sets of dispersion parameters are built into the model, Pasquill-Gifford(3) and Briggs(4). The model is capable of handling up to 20 pollutants from a combination of point, area (including wind-blown) and line sources. Concentrations and depositions can be computed at any number of receptor points randomly oriented. For the purpose of plotting concentration isopleths, as many as 320 receptor points in a radial array have been employed.

DATA COLLECTION

Under the sponsorship of the U.S. Department of Energy, the National Oceanic and Atmospheric Administration Air Resources Laboratories and the Savannah River Laboratory (SRL) undertook an experimental program to provide data for model verification studies(5). This program took advantage of plumes containing ^{85}Kr that are routinely emitted from the nuclear fuel reprocessing facility at the Savannah River Plant at

Aiken, South Carolina. Krypton-85 is a chemically inert radioactive gas with a relatively long half-life (10.8 y). Thus it could be used to study the effects of atmospheric transport and dispersion free of the complications introduced by wet and dry deposition, chemical transformations, and radioactive decay. Furthermore, there are no other sources of ^{85}Kr nearby. The gas was released as non-buoyant plumes from two 62 m stacks 4 km apart. The releases were intermittent, ranging from 7% of the time during August 1977 to 77% of the time during January 1977.

Air samples were collected cryogenically at 13 locations within 150 km of the sources over a period of 2.5 y beginning in March 1975. Although some samples were collected daily and weekly, we have chosen to compare our results with the average concentrations reported for periods of approximately one month since this has been the normal minimum time period for calculations using ATM-TOX. These data are given in Table 1. The region in which the sources and receptors are located is one of gently rolling terrain, with an elevation change of only about 100 m within a circle of 150 km radius. Thus we felt justified in assuming that all of the receptors were located at the same elevation relative to the sources. Since the nearest receptor was 25 km from the sources, and since the two sources did not necessarily release gas at the same time, we assumed a single release point midway between the two sources, as did other investigators(6).

In addition to source and receptor information, SRL furnished meteorological data and average monthly daytime and nighttime mixing heights. Although meteorological data were collected at 15 stations, we used the data collected at seven towers within 10 km of the sources, since these data had already been averaged to give joint frequency distributions for monthly time periods. The wind speeds were measured at the 62 m level and stability classes were determined from observations of the standard deviation of the wind azimuth. Since no meteorological data were available from SRL for four time periods, we also used the STAR(7) data from Bush Field, Augusta, Georgia, as furnished by the National Climatic Center, Asheville, North Carolina. Stability classes in STAR data are established with reference to wind speed and solar insolation.

COMPUTER MODEL STUDIES

We ran ATM-TOX for 26 time periods using SRL meteorological data and for 13 time periods using Bush Field meteorological data. We used both the Pasquill-Gifford (P-G) and Briggs dispersion parameters. The data are given in Tables 2-5 for each of the 13 receptors. For the SRL meteorological data the values computed using the P-G parameters are slightly higher in all cases than those computed using the Briggs parameters. The average ratio is about 1.067. For the Bush Field data the values computed using the Briggs stabilities are higher in most cases, with an average ratio of 1.086.

We computed Pearson's correlation coefficient R between the measured values and each set of computed values. The results are given in Table 6 for all receptors for each time period. Some of the low values can be explained. The SRL air data for June 1975 is suspect since 98.7% of the time the wind speeds were less than 2 m/s and no speeds greater than 4 m/s were reported. The Kr^{85} releases for both August and September 1975 were quite low. Measured concentrations above a background value of 14 pCi/m^3 for August 1975 were less than 3 pCi/m^3 except for two receptors. For September 1975 only six of the 13 receptors had concentrations more than 3 pCi/m^3 above background. In contrast, the correlation coefficient between the values for September 1975 computed using SRL and Bush Field data was 0.92, indicating good agreement between the two sets of wind data for that month.

Table 7 lists the correlation coefficients for each receptor. For the results using the SRL air data, the coefficients are also computed with the values for May, June, and September 1975 omitted. For the majority of the receptors, the latter coefficients are higher. The improvement is particularly noticeable for receptors 6, 8, 9, 10, 11, and 13. The poor correlations for receptors 5 and 6 may indicate difficulties with the data collected at those sites.

Since correlation coefficients only indicate trends and do not show possible bias, we have plotted observed vs computed values of the concentrations in Figs. 1 and 2 for the two sets

of meteorological data (Pasquill-Gifford parameters). A value of 14 pCi/m^3 has been added to the computed values to correspond to the estimated background concentration(5). The dotted lines represent a factor of 2 over- or under-prediction. Although most of the computed values over-predict, the majority of the computed values fall within a factor of 2 for the SRL data and 75% of the values fall within a factor of 2 for the Bush Field data. The SRL data for June 1975 are flagged since these values are suspect as previously indicated. For both sets of data, the slope is approximately 1.0, indicating a constant ratio of over-prediction.

CONCLUSIONS

The ^{85}Kr data and associated meteorological data collected by SRL have proven to be a valuable resource for validation of air quality models. The results obtained with ATM-TOX agree closely with other investigators(6) using Gaussian plume models, indicating that, in general, such models can be used to predict ground level air concentrations of pollutants within a factor of 2 up to distances of 150 km from a source.

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TABLE 1

Measured ^{85}Kr Concentrations (pCi/m^3)
(Includes Background Value of 14-15 pCi/m^3)

Time Period		Receptors 2	3	4	5	6	7	8	9	10	11	12	13	14
1	Mar 75	38.1	22.6	19.7	28.1	17.5	19.7	17.9	17.2	76.6	33.3	18.8	29.5	86.7
2	Apr 75	38.8	30.7	23.8	17.7	17.5	29.1	33.1	37.7	55.4	32.6	21.6	23.3	100.9
3	May 75	19.7	19.8	18.1	17.9	15.4	21.1	55.9	54.8	55.5	26.8	23.7	20.5	73.2
4	Jun 75	80.0	30.4	32.7	23.5	15.4	31.3	32.5	26.4	23.6	18.8	34.1	18.1	66.6
5	Jul 75	16.6	17.2	18.6	14.8	14.5	15.0	14.8	20.5	57.1	21.4	15.3	17.7	21.1
6	Aug 75	14.5	16.0	16.2	15.1	14.3	14.3	14.6	16.8	27.4	18.6	14.5	15.6	16.3
7	Sep 75	16.1	16.4	26.0	15.9	15.7	16.1	23.9	19.6	27.0	19.2	15.2	16.5	18.9
8	Oct 75	16.0	31.9	33.0	15.1	15.8	15.3	15.3	20.5	40.8	16.8	15.4	16.2	33.9
9	Nov 75	46.7	24.9	24.3	21.1	37.0	36.8	84.9	26.7	16.6	15.8	15.5	15.6	58.0
10	Dec 75	37.4	39.2	39.6	27.4	27.2	41.1	40.0	76.7	134.5	104.8	43.5	70.1	96.0
11	JAN 76	21.2	39.1	20.4	28.9	19.4	52.3	84.1	31.7	90.3	45.0	21.8	25.9	51.1
12	FEB 76	21.0	19.9	17.8	17.5	19.4	33.4	155.4	90.6	131.1	66.6	16.4	37.7	34.7
13	Mar 76	16.3	27.6	20.4	21.8	67.3	53.2	76.8	51.3	142.3	68.8	19.6	38.0	61.6
14	Apr 76	19.4	29.5	25.1	17.9	21.0	35.5	51.5	31.6	64.6	36.3	21.0	23.5	80.2
15	May 76	25.8	18.3	16.6	15.0	14.9	23.7	26.6	52.2	67.8	34.7	22.7	22.0	33.4
16	Jun 76	18.8	36.6	67.2	17.2	15.9	23.[illegible]	61.7	45.8	55.9	30.0	46.8	23.7	94.0
17	Jul 76	16.7	17.0	15.3	16.9	15.2	43.1	115.2	92.9	92.2	41.5	16.0	38.3	47.8
18	Aug 76	18.6	16.4	36.6	16.8	20.5	16.2	15.8	33.3	190.7	35.8	17.5	20.2	45.8
19	Sep 76	22.0	21.9	22.1	17.1	17.0	27.7	42.5	32.7	58.8	24.9	20.4	30.1	130.3
20	Oct 76	23.9	30.1	36.7	32.1	29.2	16.4	21.3	24.5	29.9	18.1	59.9	16.1	62.7
21	Nov 76	16.3	27.0	21.6	35.1	16.2	20.6	44.8	22.1	23.0	17.0	15.9	16.7	18.8
22	Dec 76	31.3	28.1	58.6	18.2	37.3	35.7	44.7	21.5	64.5	30.8	18.3	21.3	35.4
23	JAN 77	97.1	17.1	16.7	17.4	26.4	56.6	64.3	38.1	25.4	21.1	21.7	39.5	402.9
24	FEB 77	20.4	18.4	26.1	21.4	19.8	40.5	47.9	65.7	50.9	52.8	16.7	24.9	30.5
25	Mar 77	22.9	58.1	29.9	25.9	30.2	33.5	34.0	47.1	37.8	25.7	24.2	20.3	161.4
26	Apr 77	18.4	17.5	16.4	17.4	16.9	46.7	118.7	42.7	92.6	27.4	23.0	31.7	73.6
27	May 77	46.5	19.5	19.6	17.5	16.3	17.1	33.6	28.3	79.3	36.3	26.0	19.0	126.0
28	Jun 77	17.0	19.5	17.3	19.1	18.4	25.9	58.3	49.6	110.0	33.9	17.3	22.2	70.3
29	Jul 77	15.7	15.6	16.0	15.5	14.0	16.0	16.4	27.5	106.3	65.7	16.3	27.3	16.6
30	Aug 77	17.8	16.0	15.9	16.0	14.0	15.5	15.5	16.0	29.3	19.0	20.5	17.1	33.8

TABLE 2

Computed ^{85}Kr Concentrations (pCi/m^3)
(SRL meteorological data, Pasquill-Gifford Stabilities)

Receptors

Time Period	2	3	4	5	6	7	8	9	10	11	12	13	14
3 May 75	37.6	8.4	22.1	2.8	153.9	100.9	193.8	28.0	25.1	11.8	10.5	8.0	23.7
4 Jun 75	110.6	334.3	200.4	71.0	90.2	294.0	554.4	373.4	617.2	267.6	57.7	172.7	339.8
7 Sep 75	11.9	8.1	8.1	9.6	14.7	3.1	5.6	4.3	3.9	1.8	12.5	1.2	49.1
8 Oct 75	22.9	116.4	48.4	29.3	14.1	26.6	49.9	27.9	56.2	26.3	8.3	17.2	82.9
9 Nov 75	38.0	62.9	21.2	22.1	57.9	46.5	87.6	17.3	5.6	2.8	58.3	1.9	73.9
10 Dec 75	91.4	249.2	79.5	36.0	92.7	155.7	296.2	83.8	288.6	133.6	69.9	88.0	206.7
11 Jan 76	24.6	39.5	34.0	9.8	19.9	54.2	106.1	40.4	66.1	30.0	50.9	19.7	82.3
12 Feb 76	29.5	40.6	23.9	19.9	28.5	101.6	189.5	130.6	287.2	133.5	120.7	87.9	85.9
13 Mar 76	32.6	14.2	26.3	8.0	19.9	50.4	94.2	52.8	130.4	60.4	70.7	40.0	72.0
14 Apr 76	26.5	53.3	42.2	24.0	17.1	50.0	96.1	32.6	71.7	31.9	44.4	20.8	106.8
15 May 76	24.4	21.3	28.7	4.4	7.5	33.7	65.4	47.1	61.0	26.8	18.4	17.4	107.4
16 Jun 76	47.8	33.0	118.6	32.3	10.8	31.9	58.5	58.8	147.2	67.2	72.1	44.2	127.0
17 Jul 76	2.8	11.7	1.9	12.6	45.0	167.0	319.7	122.4	163.8	73.1	41.2	48.0	0.0
18 Aug 76	36.1	62.5	110.4	27.5	28.5	19.4	35.2	41.1	92.9	42.9	30.8	28.5	170.2
19 Sep 76	57.0	159.6	226.3	37.5	56.8	93.3	179.6	112.8	84.3	38.4	24.9	25.2	254.2
20 Oct 76	29.1	50.3	143.4	34.8	24.4	47.9	90.4	66.3	34.5	16.2	21.1	10.6	109.3
21 Nov 76	10.1	23.0	72.7	16.5	16.8	66.6	123.6	54.3	67.8	30.9	12.7	20.2	39.3
22 Dec 76	7.9	86.2	127.7	31.2	36.8	35.9	69.6	39.0	69.5	30.8	28.4	20.1	28.2
23 Jan 77	51.9	40.7	68.9	65.9	40.5	53.2	105.2	49.1	41.0	17.8	7.9	12.0	187.4
24 Feb 77	53.8	38.2	45.8	11.4	37.5	84.8	164.5	84.6	151.3	68.2	35.1	44.6	179.5
25 Mar 77	42.5	33.0	63.4	36.8	48.2	44.7	86.7	61.1	79.5	36.6	60.5	24.2	169.2
26 Apr 77	39.0	12.3	61.8	6.8	40.8	83.1	154.7	77.9	81.3	37.7	55.1	24.8	141.2
27 May 77	55.9	16.1	110.4	10.5	25.6	61.8	115.9	37.3	122.3	55.8	34.9	36.3	203.0
28 Jun 77	56.9	110.3	74.1	8.8	15.5	55.9	105.9	57.9	132.6	59.1	16.1	38.5	196.6
29 Jul 77	9.8	5.9	24.2	8.8	16.5	42.6	80.1	51.3	123.7	55.0	27.0	35.7	38.0
30 Aug 77	18.4	2.6	5.5	1.5	0.8	5.5	9.8	10.0	35.3	16.2	13.8	10.7	70.0

TABLE 3

Computed ^{85}Kr Concentrations (pCi/m^3)
(SRL meteorological data, Briggs Stabilities)

Receptors

Time Period	2	3	4	5	6	7	8	9	10	11	12	13	14
3 May 75	37.5	8.1	22.0	2.8	153.7	99.9	185.2	27.8	24.4	11.7	10.3	8.0	22.9
4 Jun 75	104.1	289.6	188.5	67.8	86.7	279.1	491.6	347.4	500.2	251.7	55.6	172.3	243.3
7 Sep 75	11.1	7.6	7.9	9.1	14.1	3.1	5.5	4.3	3.8	1.8	12.4	1.2	39.4
8 Oct 75	21.8	102.4	45.9	27.9	13.7	25.6	45.0	26.5	49.3	24.9	8.0	17.1	70.1
9 Nov 75	36.2	57.8	20.1	21.6	55.8	44.5	77.9	16.8	5.6	2.8	56.2	1.9	55.7
10 Dec 75	86.0	225.2	76.3	34.7	89.2	147.3	258.2	79.7	254.8	127.8	67.5	87.6	179.2
11 Jan 76	23.0	35.1	32.8	9.6	19.3	51.4	91.2	38.0	57.5	28.6	49.2	19.6	70.6
12 Feb 76	27.9	37.3	23.0	19.7	27.6	97.8	171.3	123.8	252.7	127.6	116.6	87.5	72.8
13 Mar 76	31.0	13.5	25.2	7.6	19.4	48.7	86.1	50.8	116.9	58.2	68.9	39.9	63.4
14 Apr 76	25.1	48.4	39.9	22.3	16.5	47.6	85.3	30.8	61.9	30.3	43.1	20.8	87.3
15 May 76	22.8	19.4	26.9	4.2	7.3	32.2	57.9	44.4	52.0	25.3	18.0	17.3	86.8
16 Jun 76	45.7	30.1	113.4	31.0	10.8	31.1	55.0	56.2	128.6	64.3	70.3	44.1	97.7
17 Jul 76	2.8	11.5	1.9	12.3	44.1	161.1	285.9	116.4	140.9	69.7	39.9	47.8	0.0
18 Aug 76	34.6	55.5	105.1	26.4	27.7	18.9	33.4	39.8	83.7	41.5	30.2	28.4	131.6
19 Sep 76	53.6	140.2	212.7	35.2	55.0	88.8	157.5	104.9	74.1	36.6	24.0	25.0	205.6
20 Oct 76	26.8	46.2	136.5	32.3	23.7	46.0	81.6	61.8	30.2	15.3	20.4	10.5	84.8
21 Nov 76	9.2	21.0	68.7	16.1	16.2	64.0	112.2	51.7	58.2	29.3	12.3	20.1	28.5
22 Dec 76	7.8	74.4	120.7	29.6	36.0	34.6	61.3	37.2	58.8	29.3	27.5	20.1	26.2
23 Jan 77	49.0	34.5	65.3	61.5	39.0	51.5	94.0	46.4	38.4	17.6	7.9	12.0	163.3
24 Feb 77	50.1	36.2	43.9	10.6	36.5	80.8	143.0	79.7	129.3	64.7	34.0	44.4	154.3
25 Mar 77	40.4	29.7	59.9	34.7	46.5	42.7	75.9	57.5	70.6	35.2	58.4	24.1	142.4
26 Apr 77	37.2	12.3	59.0	6.7	39.5	80.0	141.1	72.9	71.4	35.9	53.2	24.6	121.6
27 May 77	52.8	16.0	105.2	9.9	25.0	59.2	104.4	35.1	104.8	52.7	33.9	36.2	167.0
28 Jun 77	53.7	98.5	70.3	8.4	15.1	53.5	94.5	55.3	111.9	56.1	15.6	38.5	172.9
29 Jul 77	9.6	5.6	23.0	8.3	16.1	41.0	72.2	48.5	104.0	52.0	26.3	35.6	35.5
30 Aug 77	17.1	2.3	5.2	1.5	0.8	5.5	9.6	9.7	31.1	15.5	13.4	10.6	54.7

TABLE 4

Computed ^{85}Kr Concentrations (pCi/m^3)
(Bush Field meteorological data, Pasquill-Gifford Stabilities)

Time Period		Receptors 2	3	4	5	6	7	8	9	10	11	12	13	14
1	Mar 75	21.6	3.1	5.6	16.7	19.2	26.5	51.0	37.4	58.9	27.5	18.0	18.0	73.1
2	Apr 75	9.9	41.2	19.3	18.1	20.8	27.2	50.8	14.0	47.7	21.0	8.7	14.1	99.3
3	May 75	17.7	28.9	16.3	35.2	40.3	20.7	39.3	22.2	40.1	18.2	23.3	12.1	171.0
4	Jun 75	19.5	102.8	17.7	30.3	34.7	10.8	21.1	27.1	80.2	36.9	12.8	24.4	102.8
5	Jul 75	25.1	17.8	14.6	34.3	39.2	14.6	26.5	18.7	71.6	33.2	28.0	22.2	128.8
6	Aug 75	4.4	3.4	3.9	3.4	3.9	1.4	2.6	2.2	5.3	2.5	5.7	1.7	23.6
7	Sep 75	6.9	10.3	3.0	9.8	11.3	3.8	7.2	0.7	1.1	0.5	3.7	0.3	27.4
8	Oct 75	8.7	11.9	3.7	13.3	15.2	9.9	18.5	16.6	18.0	8.5	11.3	5.5	33.7
9	Nov 75	19.3	7.8	17.2	56.8	64.9	64.6	120.9	53.1	73.3	34.6	24.5	22.6	188.4
10	Dec 75	81.9	39.4	52.8	35.0	39.9	57.1	107.0	135.5	147.7	67.9	49.3	44.2	163.5
11	Jan 76	6.2	28.9	3.4	21.4	24.5	24.9	47.7	29.8	84.6	39.3	14.6	25.6	83.4
12	Feb 76	30.9	35.3	25.7	62.2	71.4	59.6	112.7	95.1	139.9	66.3	15.0	43.7	170.1
13	Mar 76	13.9	32.9	10.2	7.5	8.6	23.5	44.2	44.6	40.0	18.5	49.2	12.3	154.9

TABLE 5

Computed ^{85}Kr Concentrations (pCi/m^3)
(Bush Field meteorological data, Briggs Stabilities)

Receptors

Time Period	2	3	4	5	6	7	8	9	10	11	12	13	14
1 Mar 75	24.8	3.5	6.6	19.5	22.2	29.2	52.6	39.3	57.5	28.7	21.3	19.7	76.3
2 Apr 75	11.8	45.2	22.0	20.0	22.8	30.6	55.0	15.5	50.4	23.8	9.9	16.3	114.4
3 May 75	18.8	29.9	18.3	39.3	44.7	22.5	39.9	23.1	41.7	20.3	25.8	13.9	174.3
4 Jun 75	21.9	106.3	20.6	35.1	39.9	11.6	20.7	28.9	80.3	40.0	14.5	27.5	104.9
5 Jul 75	29.1	18.7	16.4	40.3	45.8	16.1	28.3	21.5	73.8	36.5	31.1	25.0	126.5
6 Aug 75	4.7	3.5	4.2	3.8	4.3	1.5	2.7	2.4	6.0	2.9	6.3	2.0	22.8
7 Sep 75	7.5	11.2	3.5	10.8	12.3	4.1	7.5	0.8	1.3	0.6	4.0	0.4	27.0
8 Oct 75	9.3	13.8	4.2	14.8	16.8	10.3	18.1	17.1	17.4	8.8	12.4	6.0	35.5
9 Nov 75	21.1	9.2	19.4	65.7	74.6	67.8	118.7	55.3	71.4	36.1	27.1	24.8	196.9
10 Dec 75	89.3	44.7	61.9	42.0	47.7	62.6	110.4	142.9	140.5	70.9	54.8	48.6	172.9
11 Jan 76	7.2	29.9	3.8	25.2	28.7	26.9	48.2	32.3	81.0	40.7	16.5	27.9	85.2
12 Feb 76	35.2	39.6	27.3	67.1	76.1	64.2	112.3	98.1	140.3	70.9	17.7	48.6	163.5
13 Mar 76	16.4	35.5	12.1	9.0	10.3	26.0	46.8	46.3	40.9	20.1	55.4	13.8	156.1

TABLE 6

Comparison of Measured and Computed ^{85}Kr Concentrations (Pearson's Coorelation Coefficient) as a Function of Time Period

Time Period	SRL Air Data		Bush Field Air Data	
	Briggs Stab.	P-G Stab.	Briggs Stab.	P-G Stab.
1 Mar 75			0.727	0.739
2 Apr 75			0.872	0.862
3 May 75	0.105	0.118	0.660	0.674
4 Jun 75	-0.142	-0.077	0.149	0.159
5 Jul 75			0.409	0.408
6 Aug 75			0.083	0.060
7 Sep 75	-0.142	-0.122	-0.221	-0.204
8 Oct 75	0.716	0.721	0.335	0.347
9 Nov 75	0.715	0.749	0.651	0.669
10 Dec 75	0.407	0.405	0.645	0.690
11 Jan 76	0.758	0.777	0.745	0.779
12 Feb 76	0.851	0.858	0.614	0.604
13 Mar 76	0.768	0.785	0.196	0.211
14 Apr 76	0.856	0.885		
15 May 76	0.551	0.530		
16 Jun 76	0.759	0.804		
17 Jul 76	0.837	0.848		
18 Aug 76	0.442	0.410		
19 Sep 76	0.523	0.596		
20 Oct 76	0.260	0.326		
21 Nov 76	0.613	0.615		
22 Dec 76	0.643	0.657		
23 Jan 77	0.843	0.855		
24 Feb 77	0.575	0.552		
25 Mar 77	0.841	0.861		
26 Apr 77	0.838	0.848		
27 May 77	0.792	0.834		
28 Jun 77	0.679	0.704		
29 Jul 77	0.769	0.790		
30 Aug 77	0.958	0.954		

TABLE 7

Comparison of Measured and Computed ^{85}Kr Concentrations
(Pearson's Coorelation Coefficient) as a Function of Receptor

	SRL Air Data (26 time periods)		SRL Air Data (23 time periods)		Bush Field Air Data (13 time periods)	
Receptor	Briggs Stab.	P-G Stab.	Briggs Stab.	P-G Stab.	Briggs Stab.	P-G Stab.
2	0.569	0.570	0.357	0.357	0.220	0.219
3	0.292	0.288	0.270	0.268	0.420	0.404
4	0.464	0.459	0.474	0.469	0.541	0.516
5	0.191	0.189	0.109	0.106	0.093	0.061
6	-0.003	0.001	0.213	0.213	-0.028	-0.043
7	0.278	0.278	0.421	0.421	0.513	0.508
8	0.258	0.251	0.526	0.512	0.673	0.684
9	0.215	0.207	0.785	0.777	0.795	0.801
10	0.202	0.173	0.607	0.603	0.597	0.599
11	0.365	0.358	0.828	0.827	0.683	0.690
12	0.169	0.169	0.125	0.124	0.469	0.472
13	0.334	0.335	0.722	0.722	0.686	0.691
14	0.449	0.405	0.521	0.505	0.470	0.406

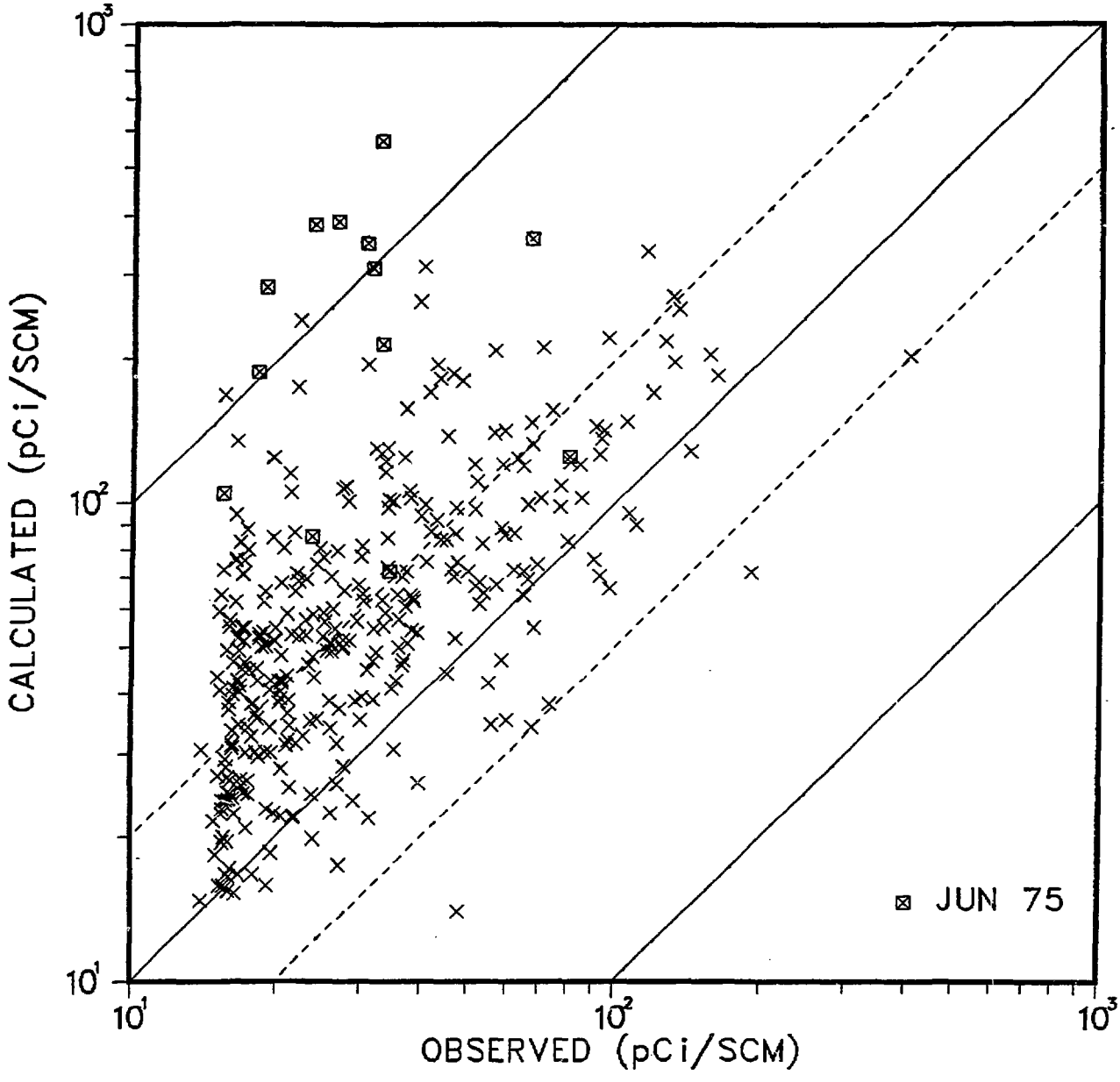

Figure 1. Comparison of Observed and Calculated Kr^{85} Concentrations for 13 Receptors and 26 Time Periods (SRL Meteorological Data, P-G Parameters, 14 pCi/m^3 has been added to calculated values)

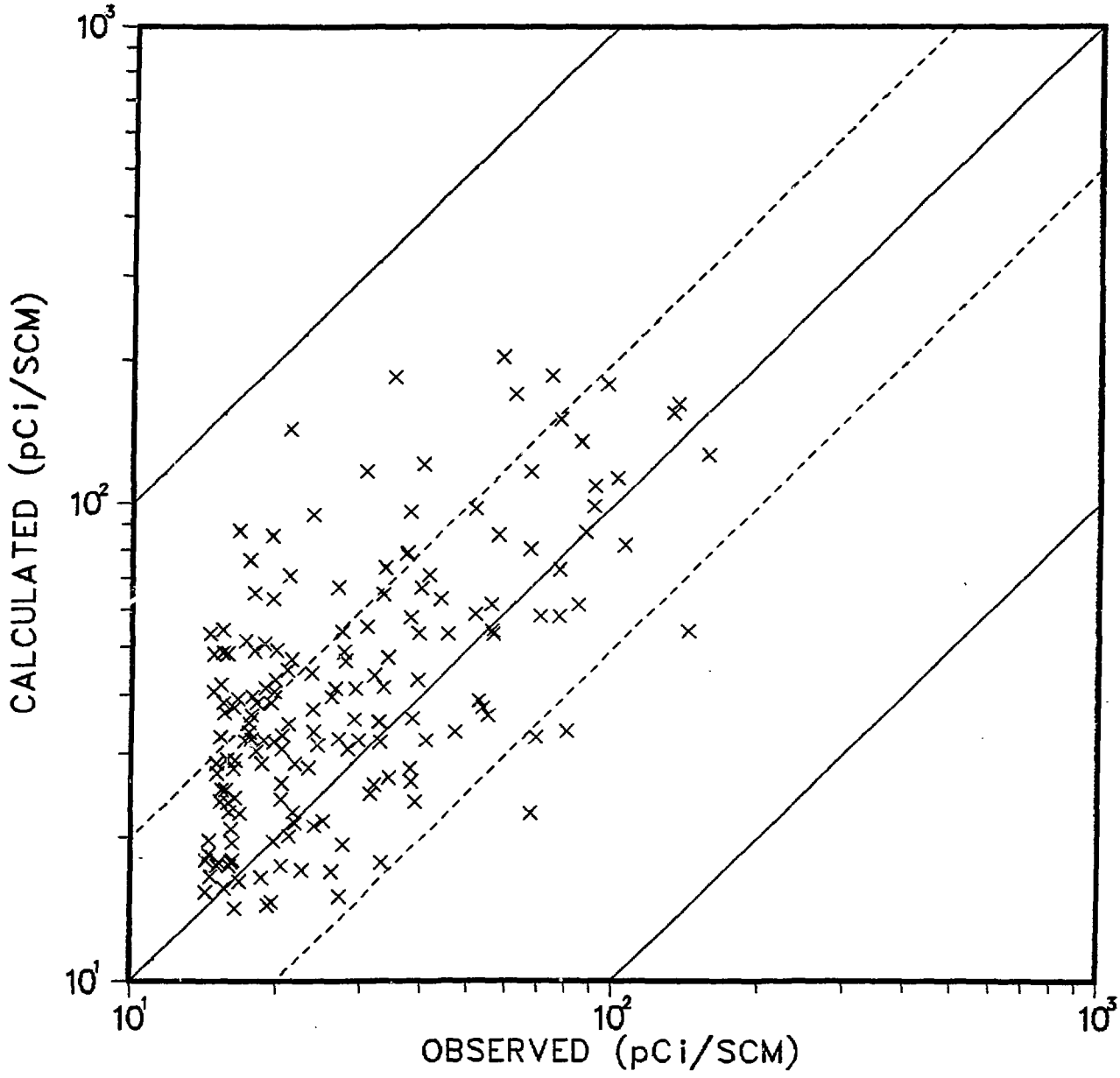

Figure 2. Comparison of Observed and Calculated Kr^{85} Concentrations for 13 Receptors and 13 Time Periods (Bush Field Meteorological Data, P-G Parameters, 14 pCi/m^3 has been added to calculated values)