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Multi-seasonal measurements of the ground-level atmospheric ice-nucleating particle abundance on the North Slope of Alaska

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S1 INLET LOSS TEST

The particle loss test for the inlet used for PINE-03 during the ExINP-NSA campaign was conducted at the BRW-NSA on October 22nd, 2021. On this day, aerosol concentration was stable with a daily mean ± standard error of 83.66 ± 3.91 cm^{-3} based on the 6-hour time averaged CPC counts. A calm mean wind speed of 1.40 ± 0.18 m s^{-1} consistently from the northwest direction (300.68 ± 3.12°) was observed with a moderate temperature for fall (−1.97 ± 0.19 °C). A total of only 0.001 inches of precipitation was measured during the test period (21:35 – 23:50 UTC).

Figure S1 (a) shows an experimental schematic of the test. The loss of particles in the inlet used at the BRW site (presumably due to gravitational settling and diffusion loss) was quantified using an optical particle sizer, OPS (model 3330, TSI Inc.). Briefly, we moved an OPS back and forth between the downstream position of the inlet inside the building and the roof of the building to examine the difference in particle size distributions in ambient air vs. air through the inlet and characterize the associated particle loss through the inlet. The inlet was composed of a PVC stack, stainless steel sampling pickup inlets (3/4 inch outer diameter) connected to a vertical sampling stack (4-inch diameter, 12 m height above ground level). A 3/8-inch conductive tube bridged the pickup port to the suite of instruments in the observatory. Total flow down the PVC stack was set to ≈ 260 LPM during the entire study period and we sub-sampled from the center of the stack.

The OPS measurements were made for 30 minutes each inside the observatory downstream of the stack inlet and at the top of the 12 m height laminar stack inlet without a rainhat. Figure S1 (b) shows the particle distribution measured inside the observatory (through the sampling line, red and green) and at the top of the inlet (in ambient air, blue). The difference between a set of inside-outside and outside-inside measurements normalized to the average OPS counts for individual OPS bin sizes was used to compute the particle loss rate as a function of optical particle diameter. As shown in Fig. S1 (c), the aerosol particle diameter corresponding to the 50% particle loss through the stack inlet from the ExINP-NSA campaign is 2.3 µm in optical diameter. This size is slightly smaller than the 50% particle loss of the PINE-03 chamber (i.e., 4 µm in aerodynamic diameter) under the spherical assumption. Thus, our INP measurement was limited to this particle loss size.

During the campaign, both INP and total aerosol abundances were measured through sampling stack inlets about 1 m apart. The PINE instrument was connected to the NOAA guest

inlet, while the particle counter measuring n_{aer} sampled through the main inlet. Fig S1a shows the two inlets – the white pipe is the main inlet and the grey pipe is the guest inlet. The flow velocities in the two inlets are similar and they are not expected to impact each other. The upper size of measurable n_{aer} and n_{INP} is limited by the size of particles passing through the stack inlet, which is <3 µm. The n_{ear} measurement is based on a CPC, which has a measurable size range from ≈0.01 to ≈3.0 µm. The lower bound of measurable particle size is limited by a diffusion loss of particles through the inlet and should be consistent for both INP and total aerosols. Note that, while we cannot define the lower bound of measurable INP size, small aerosols provide small surfaces, which do not contain as many active sites as on larger particles (unless it is known ice nucleation active biological particles). The lower size limit of homogeneous freezing can be as small as the size of a water cluster of 100-300 water molecules (<10 nm), but it occurs below -35 °C, which is outside of our measured freezing temperature ranges.

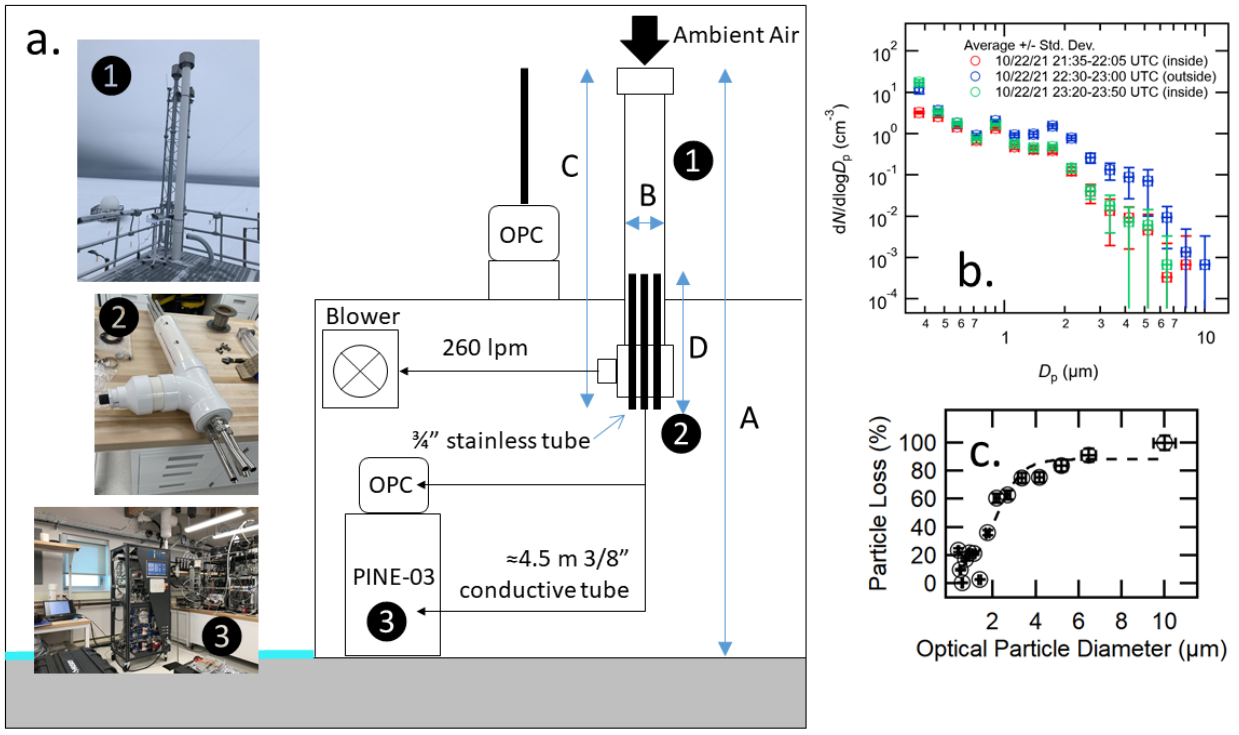

Figure S1: Panel (a) shows an experimental schematic of the particle loss test through the PVC stack inlet at the BRW site (A = 12 m; B = 0.1 m; C = 7.6 m; D = 0.9 m). Panels (b) and (c) show the particle size distributions measured inside and outside the observatory and particle loss through the inlet as a function of particle diameter. Each data point is shown ± a 5% size uncertainty on the x-axis and ± the standard deviation of three measurements on the y-axis (20-second time average for each data point).

S2 STATISTICAL ERRORS IN PINE-03

The statistical uncertainties in n_{INP} measured by PINE-03 were estimated for the selected freezing temperatures of ≈ −11°C, −16 °C, −21 °C, −26 °C, and −31 °C. The measurements for this error analysis were performed at the BRW site from May 14 to March 23, 2024 (operation ID between 1485 and 1506). To determine the uncertainty in n_{INP} at each temperature, two types of measurements utilizing filtered and ambient air were conducted to measure the average amount of ice crystals in filtered air ($\hat{\lambda}_f = \frac{N_f}{t_f}$) and that in ambient air ($\hat{\lambda}_a = \frac{N_a}{t_a}$), respectively, and the relative error was calculated following the method described by previous studies (e.g., Krishnamoorthy and Lee, 2013; Moore, 2020; and Wilbourn et al. 2024). In each set of 10 runs (represented by a subscript *f* or *a*), the cumulative number of ice crystals counted by the optical particle counter (OPC) (N) was scaled to the number of expansions (t). Each expansion was performed with a flushing time of 600 seconds, and filtered and ambient air runs were alternated after each run and paired for a reasonable comparison. The ambient data at a given temperature is only considered valid if it is statistically different from the background filtered air. To determine this validity, a moment-based Z statistic (Z_m) was calculated and compared with a 90% confidence interval, using α of 0.2 and $Z_{1-\alpha/2}$ of 1.96 (the ambient data is valid if $Z_m > Z_{1-\alpha/2}$; otherwise, invalid). By following Krishnamoorthy and Lee (2013), the Z_m values were computed for examined temperatures:

$$Z_m = \frac{\hat{\lambda}_a - \hat{\lambda}_f}{\sqrt{\hat{\lambda}\left(\frac{1}{t_a}+\frac{1}{t_f}\right)}} \quad [S1]$$

where

$$\hat{\lambda} = \frac{N_a+N_f}{t_a+t_f} \quad [S2]$$

and the Poisson mean ± confidence interval (CI) can be calculated as follows:

$$\hat{\lambda}_a - \hat{\lambda}_f + \frac{z^2_{1-\frac{\alpha}{2}}}{2} * \left(\frac{1}{t_a} - \frac{1}{t_f}\right) \pm z_{1-\frac{\alpha}{2}} * \sqrt{\left(\frac{\hat{\lambda}_a}{t_a} + \frac{\hat{\lambda}_f}{t_f}\right) + \frac{z^2_{1-\frac{\alpha}{2}}}{4} * \left(\frac{1}{t_a} - \frac{1}{t_f}\right)^2} \quad [S3]$$

The Poisson error was calculated for the relative size of CI to *Mean* in % at each tested temperature. Table S1 summarizes the results. While the estimated statistical error can exceed the systematic error in n_{INP} (±20%) reported by Möhler et al. (2021), our error values suggest that n_{INP}

measured by PINE-03 at ENA is statistically valid for temperatures below −16 °C for the given CIs (i.e., $Z_m > 1.96$).

Table S1: PINE-03 Poisson mean and error in n_{INP} (L^{-1}) during times when PINE-03 was measuring the INP concentration, n_{INP}, in filtered air and unfiltered (ambient) air at the BRW site. The measurements of flush periods, 600 seconds, which is our standard flushing time in daily operations, were examined. The number of expansions used for each calculation is reported as t_f and t_a for filtered and ambient air, respectively. If the measured error is statistically invalid, the mean ± confidence interval is reported as "n/a".

Temperature (°C)	Flush Time (s)	$\hat{\lambda}_f$	t_s	$\hat{\lambda}_a$	t_a	*Mean*	*CI*	Z_m
−11	600	0.00	10	0.28	10	0.28	0.33	1.66
−16	600	0.00	10	0.47	10	0.47	0.42	2.16
−21	600	0.08	10	0.71	10	0.63	0.55	2.23
−26	600	0.00	10	2.13	10	2.13	0.91	4.62
−31	600	0.28	10	12.80	10	12.52	2.24	10.94

S3 Effective Aerosol Scattering Efficiency

Here we discuss the method to estimate an effective aerosol scattering efficiency (Q_{eff}) that is representative of the BRW clean air sector during this study. The clean air sector at BRW is assumed to be dominated by marine aerosol. Here we utilize data from El Arenosillo, Spain during clean marine conditions to estimate a representative Q_{eff} value. At El Arenosillo clean marine conditions are identified when the following aerosol characteristics are met: scattering Ångström exponent (< 1), single scattering albedo (> 0.92), absorption coefficient (< 3 Mm^{-1}), and scattering coefficient (< 30 Mm^{-1}).

El Arenosillo data were used because their observations include sub-micron particle number size distribution (from a scanning mobility particle spectrometer (SMPS, model 3938, TSI Inc.), coarse mode particle number size distribution (from an aerosol particle sizer (APS, model 3321, TSI Inc.), and measured aerosol scattering coefficient (σ_{sp}) at two sizes (less than 1 μm ($\sigma_{sp,meas,1}$) and less than 10 μm ($\sigma_{sp,meas,10}$)) from an integrating nephelometer (model 3563, TSI Inc.), enabling determination of coarse mode scattering ($\sigma_{sp,meas,coarse} = \sigma_{sp,meas,10} - \sigma_{sp,meas,1}$).

The Q_{eff} value is estimated by the following three steps:

(1) Assess quality of the El Arenosillo size distribution data using number concentration (N_{tot}) and scattering coefficient (σ_{sp}) closure tests. For the number closure test we find that $N_{tot,cpc}$ measured by a condensation particle counter (model 3010, TSI Inc.) is equivalent to the integrated $N_{tot,smps}$ calculated from scanning mobility particle sizer (model 3936, TSI Inc., Sorribas et al., 2011) measurements:

$$N_{tot,smps} = \Sigma\, dN_i d\log(d_i) \quad [S1]$$

where d_i is the diameter of size bin i and N_i is the number of particles in size bin i.

For the scattering closure test we used using Mie theory to show that $\sigma_{sp,meas,1}$ is equivalent to $\sigma_{sp,calc,1}$ calculated from the SMPS particle number size distribution and that $\sigma_{sp,meas,coarse}$ was consistent with scattering calculated from the APS aerosol size distribution ($\sigma_{sp,calc,coarse}$):

$$\sigma_{sp,calc} = \Sigma\, (\pi/4)\, Q_i\, d_i^2\, N_i \quad [S2]$$

where Q_i is the particle scattering efficiency for a particle of diameter d_i. Q_i was calculated for the nephelometer wavelengths (450, 550 and 700 nm) and assuming a refractive index of 1.50 – i0.01. These closure tests demonstrated consistency amongst the three independent aerosol measurements and indicate the data are of high quality and can be used to estimate Q_{eff}.

(2) Calculate surface area, A, from measured aerosol size distribution (from SMPS or APS) using:

$$A = \Sigma\, \pi d_i^2\, N_i \quad [S3]$$

(3) Calculate Q_{eff} for fine or coarse mode using:

$$Q_{eff} = 4\sigma_{sp,calc} / A \quad [S4]$$

Table S2 shows the resulting coarse mode Q_{eff} data for each month based on the APS and nephelometer data. As seen in the table, marine coarse mode Q_{eff} values are slightly lower than for all data. Moreover, marine coarse mode Q_{eff} is less variable (less of a seasonal cycle) for marine conditions. Thus, the monthly averaged coarse mode Q_{eff} value of 2.37 (± 0.04 standard deviation) from El Arenosillo, Spain, is considered to be a representative Q_{eff} for clean marine conditions and is used in this study. This Q_{eff} value falls in the range of previously reported Q_{eff} values for submicron particles (1.08 – 3.0) and is also similar to Q_{eff} values for coarse particles estimated in predominantly marine conditions (i.e., Q_{eff} = 2.27 from Testa et al., 2021 and Q_{eff} = 2.0 from DeMott et al., 2016).

Table S2: Monthly and annual effective coarse mode Q_{eff} for all conditions and for clean marine conditions from El Arenosillo, Spain. The Q_{eff} value in the table is from the nephelometer and APS comparison.

Condition	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
Q_{eff} all	2.68	2.62	2.38	2.34	2.4	2.46	2.45	2.33	2.45	2.49	2.56	2.55	2.48
Q_{eff} marine	2.38	2.35	2.38	2.39	2.3	2.43	2.42	2.41	2.41	2.3	2.37	2.33	2.37

S4 SEASONAL $N_{INP}(T)$ AND $N_S(T)$ HISTOGRAMS

The seasonal breakdowns of the $n_{INP}(T)$ and $n_s(T)$ histograms are shown in Figs. S2 and S3, respectively. The clean subset data are used to generate these plots.

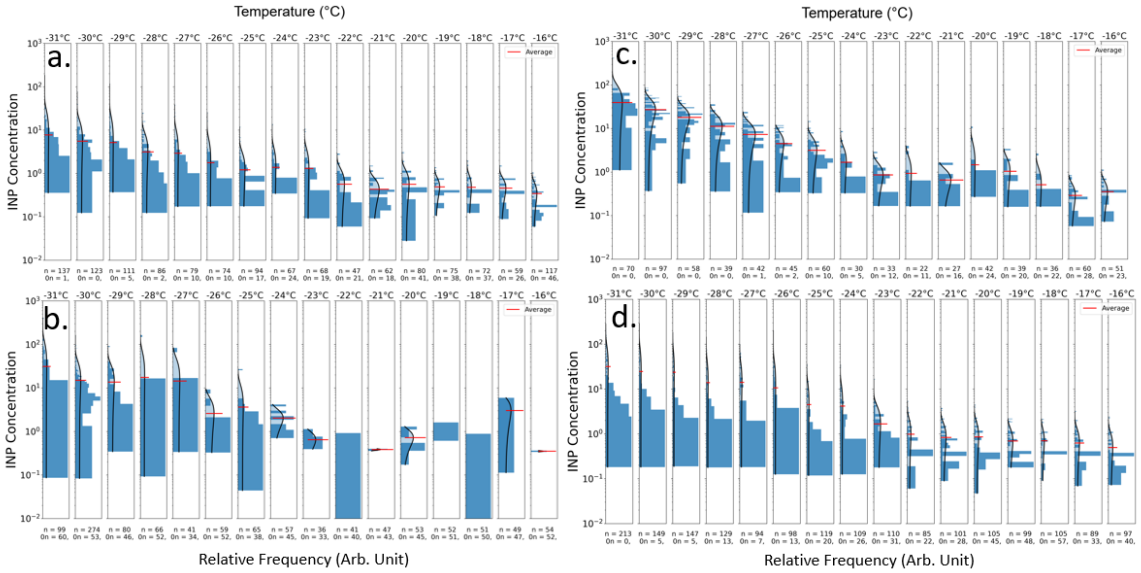

Figure S2. Histogram of the seasonally resolved $n_{INP}(T)$ Gaussian distribution with a degree temperature bin for a statistically validated freezing temperature range (−16 to −31 °C). Panels (a) − (d) are seasonal breakdowns of the clean fall, winter, spring, and summer, respectively. Individual data densities, zero INP counts, and relative frequencies (Arbitrary Unit) for each degree are shown at the bottom of each panel. Red horizontal lines in each relative frequency distribution sub-panel represent the average. Figure 6a in the main manuscript represents the overall data.

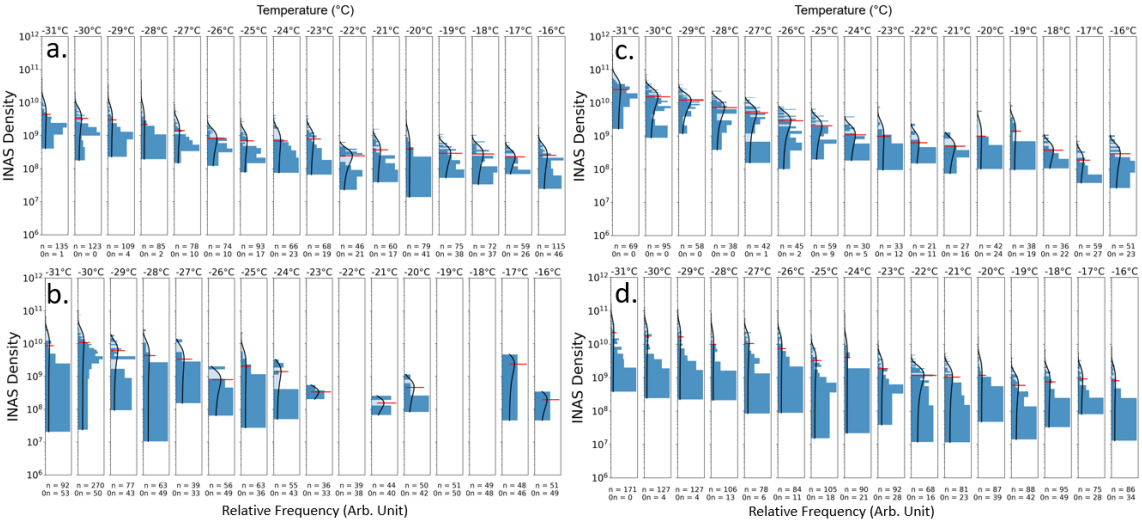

Figure S3. Histogram of the seasonally resolved $n_s(T)$ Gaussian distribution with a degree temperature bin for a statistically validated freezing temperature range (−16 to −31 °C). Panels (a) − (d) are seasonal breakdowns of the 'clean' fall, winter, spring, and summer, respectively. Individual data densities, zero INP counts, and relative frequencies (Arbitrary Unit) for each degree are shown at the bottom of each panel. Red horizontal lines in each relative frequency distribution sub-panel represent the average. Figure 6b in the main manuscript represents the overall data.

S5 ALL DATA-BASED $N_{INP}(T)$ AND $N_S(T)$ SPECTRA

Figure S4 shows the 6-hour averaged PINE-03-measured $n_{INP}(T)$ and $n_s(T)$ spectra as a function of freezing temperatures (1 °C resolution) as box plots (a − b) and seasonal spectra (c − d) based on the all-inclusive data.

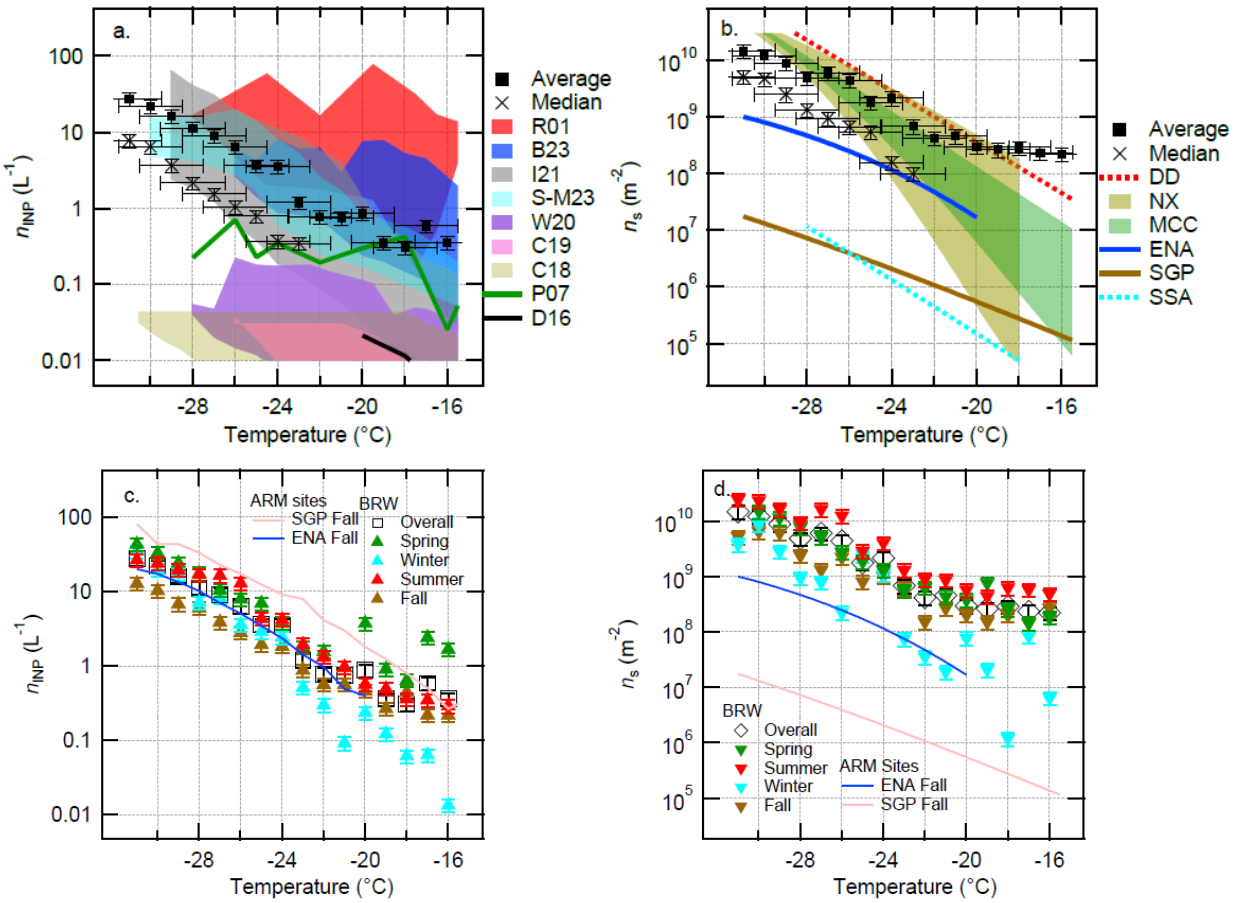

Figure S4. Box plot of the PINE-03 based $n_{INP}(T)$ and $n_s(T)$ spectra with a degree temperature bin for a statistically validated freezing temperature range at BRW (a − b; −16 to −31 °C). The 'all' data were used to generate this figure. Individual data points display average (black solid symbol) and median (black open symbol) in Panel a. The color-shaded area in panel (a) shows the maximum and minimum $n_{INP}(T)$ measured by previous INP studies at or in the proximity of BRW (see Table A1 and Sect. 1 for references). The reference $n_s(T)$ spectra in panels (b) are adopted from W24 (Wilbourn et al., 2024 and references therein) for SGP, ENA, Desert Dust, Sea Spray Aerosol, illite NX, and microcrystalline cellulose. Panels (c) and (d) are seasonal breakdowns of the average data presented in Panels a and b, respectively. The vertical bars are adopted from W24. Note: the temperature uncertainty of PINE-03 is ±1.5 °C.

S6 SEASONAL N_S PARAMETERIZATIONS

Figure 8b in the main manuscript shows the $n_s(T)$ spectra for each season based on NOAA's screened (clean) data. Following Li et al. (2022) and Wilbourn et al. (2024), we computed seasonal $n_s(T)$ parameterizations that fit the average values of the log-normal $n_s(T)$ distribution as a function of freezing temperatures. The resulting fit curves and equations for each season are presented in Fig. S5:

$$n_s^{fall}(T) = exp\left(20.750 \times exp\left(-exp(0.109 \times (T + 14.050))\right) + 4.995\right) \quad r = 0.92 \quad [S5]$$
$$-31\,°C \le T \le -21\,°C.$$

$$n_s^{winter}(T) = exp\left(22.500 \times exp\left(-exp(0.950 \times (T + 25.650))\right) 0.545\right) \quad r = 0.88 \quad [S6]$$
$$-31\,°C \le T \le -25\,°C.$$

$$n_s^{spring}(T) = exp\left(24.250 \times exp\left(-exp(0.109 \times (T + 14.050))\right) + 3.215\right) \quad r = 0.99 \quad [S7]$$
$$-31\,°C \le T \le -21\,°C.$$

$$n_s^{summer}(T) = exp\left(17.250 \times exp\left(-exp(0.159 \times (T + 14.050))\right) + 7.665\right) \quad r = 0.97 \quad [S8].$$
$$-31\,°C \le T \le -21\,°C.$$

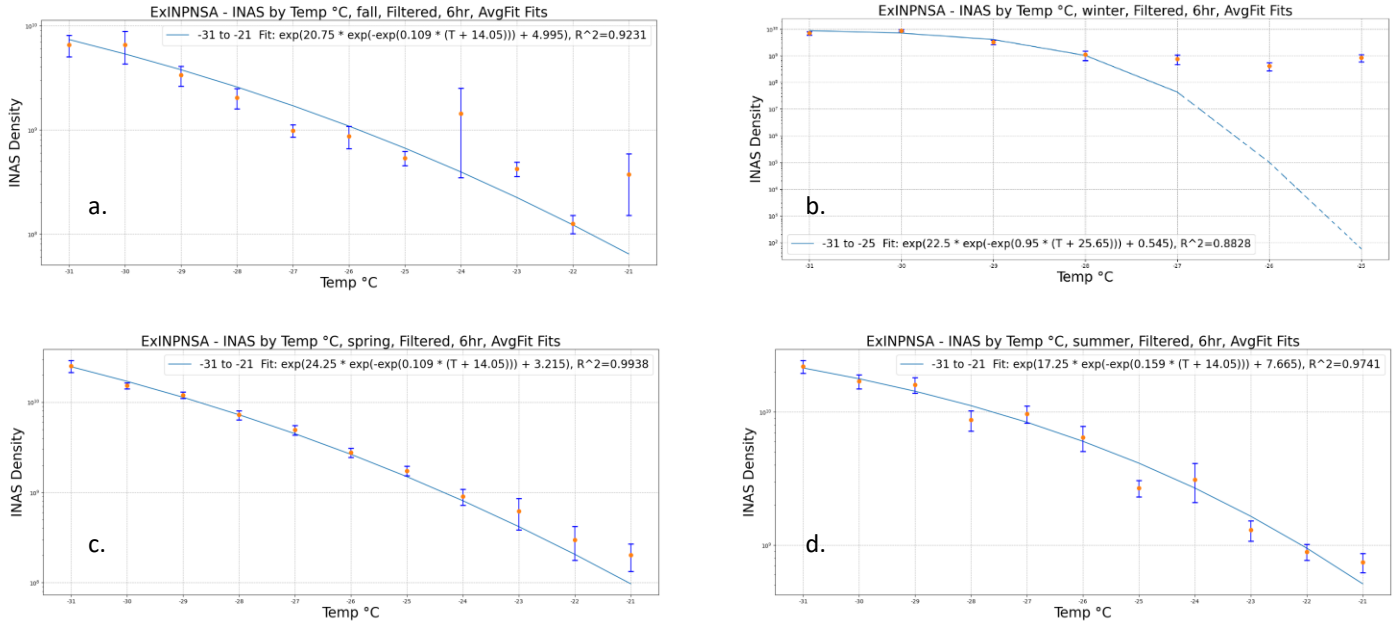

Figure S5. Seasonal $n_s(T)$ parameterizations that fit the median values of the log-normal $n_s(T)$ distribution as a function of freezing temperatures based on the clean data; fall (a), winter (b), spring (c), and summer (d).

S7 SEASONAL BACK TRAJECTORIES

The details of high- and low-INP episodes presented in Fig. 9 in the main manuscript are shown in Figs. S6 and S7. Figures S8 and S9 display the seasonality of back trajectories and sources of air masses for all *T*s (−20, −25, and −30 °C) and any *T*s cases, respectively. A list of high- and low-INP periods from BRW for subsets of 'all' data is provided in Table S3. We made two subsets of high- and low-INP episodes; one where all three temperatures had to exceed the percentile thresholds ('all three *T*s') and another with the same thresholds but where the sample qualified if 'any' of the three examined temperatures met the threshold. For the former case, we identified 15 high INP episodes and 15 low INP episodes. For the latter case, we identified 291 data points as being in a high INP period and 364 as being in a low INP period (SI Table S3).

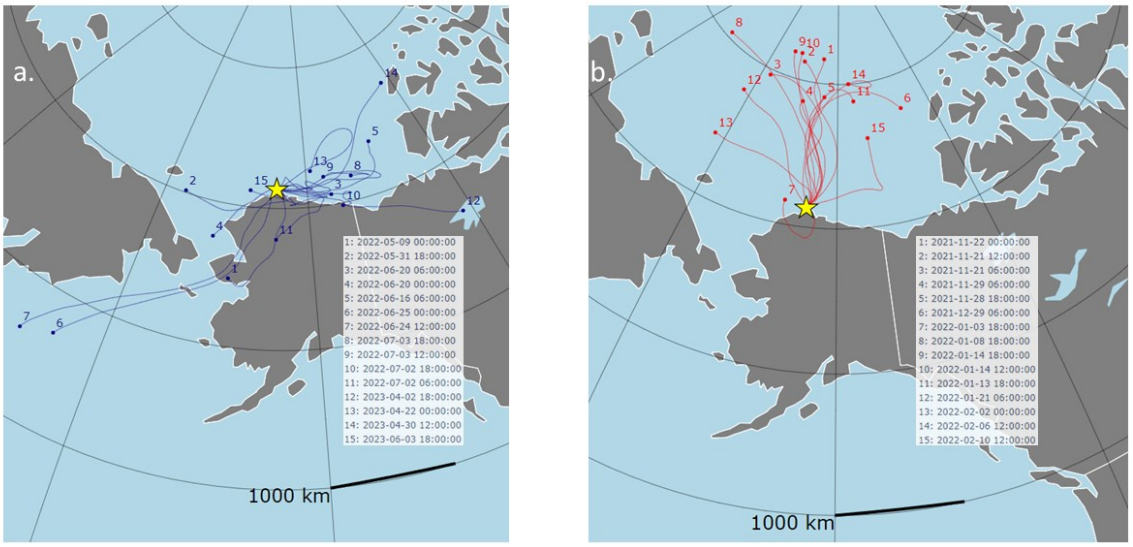

Figure S6. Air mass origins and back trajectories at the inlet height from BRW (yellow star). The air mass trajectories during high- and low-INP episodes are shown in blue and red colors. Panel (a) represents the data selected with a low − high threshold of the 25th − 75th percentile based on n_s, at all −30, −25, and −20 °C (below or above at 'all' temps). Panel (b) represents the data selected with a low – high INP threshold of the 25th – 75th percentile based on $n_s(T)$ at all selected temperatures.

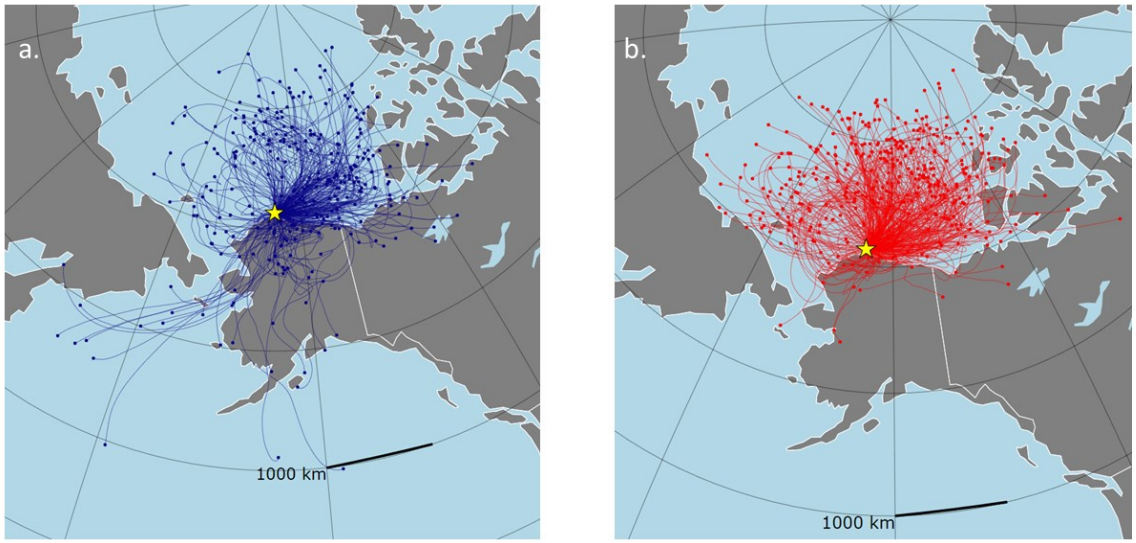

Figure S7. Air mass origins and back trajectories at the inlet height from BRW (yellow star). The air mass trajectories during high- and low-INP episodes are shown in blue and red colors. Panel (a) represents the data selected with a low − high threshold of the 25th – 75th percentile based on n_s, at any −30, −25, and −20 °C (below or above at 'any' temps). Panel (b) represents the data selected with a low – high INP threshold of the 25th – 75th percentile based on $n_s(T)$ at any selected temperatures.

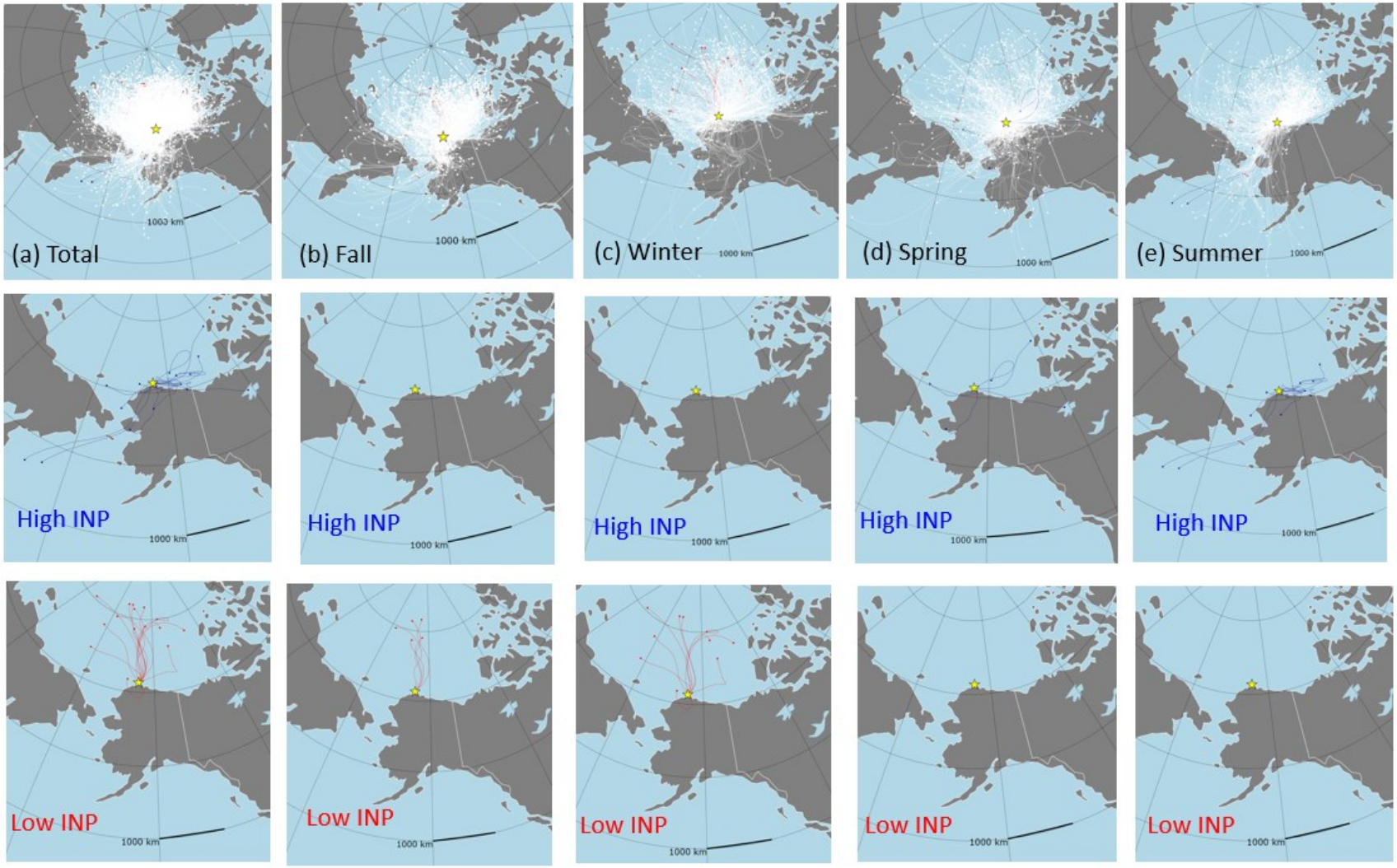

Figure S8. Air mass origins and back trajectories at the inlet height from BRW; all trajectories in October 2021 − December 2023. The air mass trajectories during high- and low-INP episodes are shown in blue and red colors. This figure represents the data selected with a low − high threshold of the 25th – 75th percentile based on n_s, at −30, −25, and −20 °C (below or above at 'all' temps). Figure S8a represents the overall data. Panels (b) − (e) are seasonal breakdowns of the 'clean' fall, winter, spring, and summer, respectively.

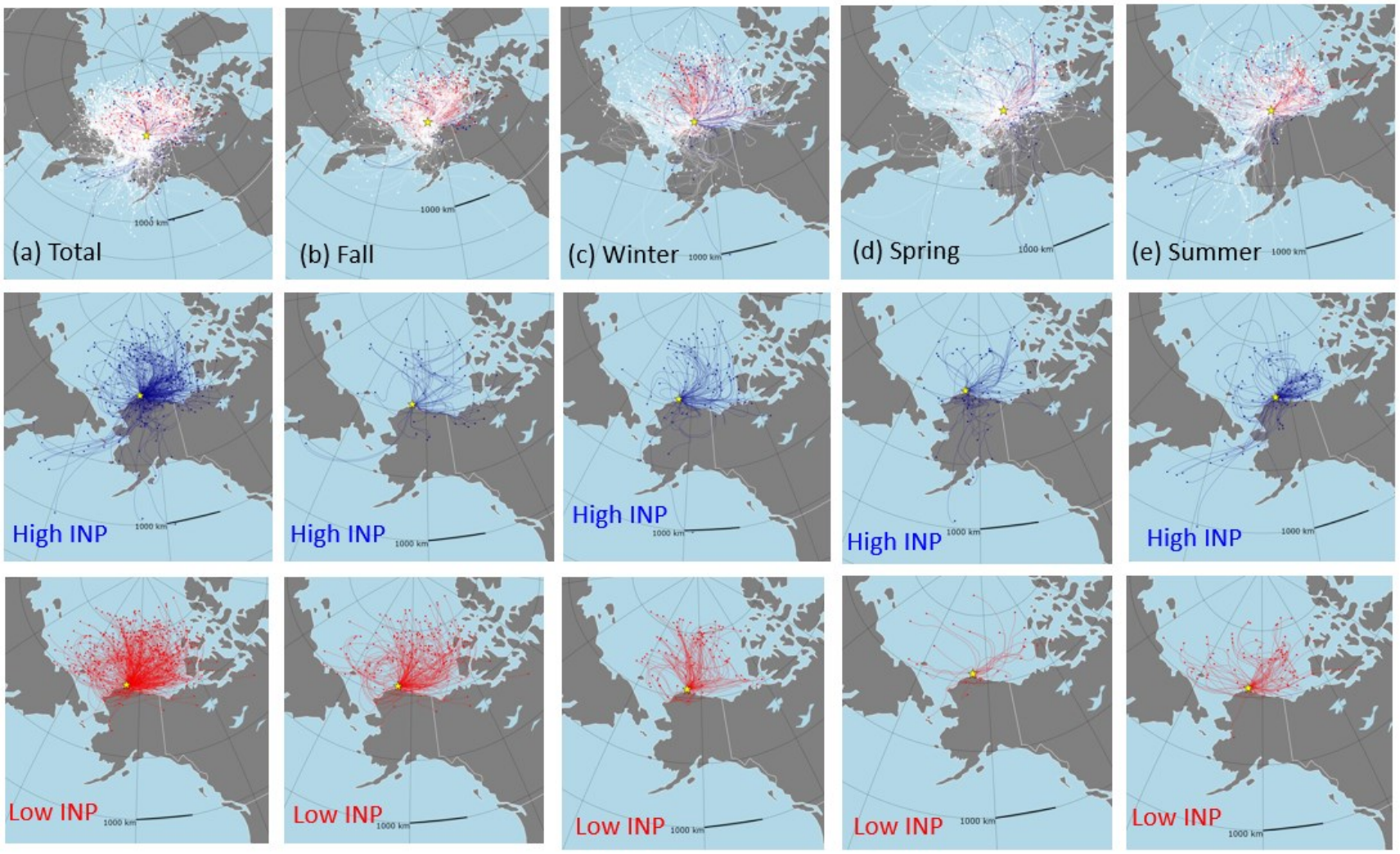

Figure S9. Air mass origins and back trajectories at the inlet height from BRW; all trajectories in October 2021 − December 2023. The air mass trajectories during high- and low-INP episodes are shown in blue and red colors. This figure represents the data selected with a low − high threshold of the 25th – 75th percentile based on n_s, at −30, −25, and −20 °C (below or above at 'any' temps). Figure S9a represents the overall data. Panels (b) − (e) are seasonal breakdowns of the 'clean' fall, winter, spring, and summer, respectively.

Table S3. List of high- and low-INP periods from BRW for subsets of 'all' data. Note: refer to Sect. 3E in main manuscript for the selection criteria of high- and low-INP episodes and the difference between 'all' or 'any' examined temperatures. *Clean data

	ID	Date & Time (UTC)	n_s(m^{-2})		
			−30 °C	−25 °C	−20 °C
All *T*s	1	5/9/2022 0:00	2.05E+10	2.24E+09	5.70E+08
High	2	5/31/2022 18:00	2.38E+10	2.84E+09	7.23E+08
INP	3	6/20/2022 6:00	1.60E+10	2.66E+09	3.26E+08
n = 15	4	6/20/2022 0:00	3.96E+10	6.93E+09	3.34E+08
	5	6/16/2022 6:00	3.87E+10	7.61E+09	1.31E+09
	6	6/25/2022 0:00	5.86E+10	8.86E+09	5.91E+08
	7	*2022-06-24 12:00:00	1.69E+10	2.64E+09	5.33E+08
	8	7/3/2022 18:00	1.01E+11	1.69E+10	3.51E+09
	9	7/3/2022 12:00	6.00E+10	7.27E+09	3.73E+08
	10	7/2/2022 18:00	8.59E+10	1.07E+10	8.40E+08
	11	7/2/2022 6:00	1.94E+10	6.71E+09	8.19E+08
	12	4/2/2023 18:00	2.44E+10	3.91E+09	5.63E+08
	13	4/22/2023 0:00	2.45E+10	1.69E+09	4.67E+08
	14	4/30/2023 12:00	2.19E+10	4.51E+09	3.34E+08
	15	6/3/2023 18:00	4.15E+10	2.76E+09	1.63E+10
All *T*s	1	11/22/2021 0:00	7.73E+08	0	0
Low	2	11/21/2021 12:00	4.02E+08	0	0
INP	3	11/21/2021 6:00	1.42E+09	0	0
n = 15	4	11/29/2021 6:00	0	0	0
	5	11/28/2021 18:00	0	0	0
	6	12/29/2021 6:00	0	0	0
	7	*2022-01-03 18:00:00	0	0	0
	8	*2022-01-08 18:00:00	0	0	0
	9	1/14/2022 18:00	4.25E+08	0	0
	10	1/14/2022 12:00	9.91E+08	0	0
	11	1/13/2022 18:00	0	0	0
	12	*2022-01-21 06:00:00	0	0	0
	13	*2022-02-02 00:00:00	0	0	0
	14	*2022-02-06 12:00:00	0	0	0
	15	2/10/2022 12:00	0	0	0
Any *T*s	1	*2021-10-24 12:00:00	5.31E+09	nan	2.52E+08
High	2	10/20/2021 18:00	2.84E+11	2.82E+08	6.92E+07
INP	3	10/25/2021 18:00	nan	6.94E+08	6.42E+08
n = 291	4	10/25/2021 6:00	2.29E+09	nan	4.92E+08
	5	*2021-11-01 06:00:00	nan	7.99E+09	3.78E+08
	6	11/1/2021 0:00	8.55E+09	3.21E+09	nan
	7	*2021-11-17 18:00:00	3.02E+10	9.85E+08	nan
	8	11/24/2021 0:00	1.39E+10	nan	nan
	9	11/24/2021 18:00	2.71E+10	5.70E+09	0.00E+00
	10	12/6/2021 0:00	nan	4.44E+09	8.21E+08
	11	*2021-12-05 18:00:00	3.69E+10	2.96E+08	nan
	12	1/25/2022 0:00	2.56E+10	nan	nan
	13	1/24/2022 18:00	2.67E+10	nan	2.03E+08
	14	1/24/2022 12:00	nan	3.88E+08	3.73E+08
	15	5/9/2022 6:00	2.12E+10	2.80E+09	nan
	16	5/9/2022 0:00	2.05E+10	2.24E+09	5.70E+08
	17	5/6/2022 18:00	1.34E+10	3.82E+08	nan
	18	*2022-05-16 06:00:00	1.33E+10	0.00E+00	3.46E+08
	19	5/23/2022 0:00	1.23E+10	nan	2.78E+08
	20	5/22/2022 0:00	6.47E+09	2.98E+08	2.93E+08
	21	*2022-05-23 18:00:00	5.03E+09	2.86E+08	2.97E+08
	22	6/4/2022 0:00	2.19E+10	nan	5.69E+08
	23	*2022-06-03 12:00:00	1.21E+10	1.10E+09	nan
	24	*2022-06-03 00:00:00	2.99E+10	1.18E+09	nan
	25	5/31/2022 18:00	2.38E+10	2.84E+09	7.23E+08
	26	6/8/2022 12:00	1.39E+10	8.29E+08	nan
	27	*2022-06-08 00:00:00	1.95E+10	2.06E+09	0.00E+00
	28	6/7/2022 18:00	1.33E+10	nan	nan
	29	6/4/2022 18:00	1.96E+10	nan	nan
	30	6/16/2022 0:00	8.53E+10	nan	nan
	31	6/12/2022 0:00	5.27E+10	3.28E+09	0.00E+00
	32	6/11/2022 18:00	1.95E+10	2.40E+09	0.00E+00
	33	6/11/2022 0:00	4.46E+10	4.78E+09	nan
	34	*2022-06-10 18:00:00	5.03E+09	7.32E+09	nan
	35	*2022-06-20 18:00:00	9.35E+09	2.08E+09	nan
	36	6/20/2022 6:00	1.60E+10	2.66E+09	3.26E+08
	37	6/20/2022 0:00	3.96E+10	6.93E+09	3.34E+08
	38	*2022-06-17 00:00:00	2.38E+10	nan	7.12E+08
	39	6/16/2022 18:00	1.01E+12	6.63E+09	nan
	40	6/16/2022 6:00	3.87E+10	7.61E+09	1.31E+09
	41	6/26/2022 0:00	1.29E+10	nan	7.80E+08
	42	6/25/2022 18:00	1.87E+10	3.01E+09	nan
	43	6/25/2022 12:00	nan	nan	6.93E+08
	44	6/25/2022 6:00	7.02E+10	1.27E+10	nan
	45	6/25/2022 0:00	5.86E+10	8.86E+09	5.91E+08
	46	6/24/2022 18:00	3.26E+10	4.84E+09	nan
	47	*2022-06-24 12:00:00	1.69E+10	2.64E+09	5.33E+08
	48	*2022-06-24 00:00:00	1.80E+10	2.19E+10	nan
	49	6/23/2022 18:00	1.37E+10	nan	3.41E+08
	50	7/4/2022 0:00	1.26E+11	1.90E+10	nan
	51	7/3/2022 18:00	1.01E+11	1.69E+10	3.51E+09
	52	7/3/2022 12:00	6.00E+10	7.27E+09	3.73E+08
	53	7/3/2022 6:00	7.62E+10	1.22E+10	nan
	54	7/3/2022 0:00	nan	1.40E+10	1.51E+08
	55	7/2/2022 18:00	8.59E+10	1.07E+10	8.40E+08
	56	7/2/2022 12:00	3.92E+10	nan	2.35E+08

57	7/2/2022 6:00	1.94E+10	6.71E+09	8.19E+08
58	7/2/2022 0:00	3.26E+10	7.30E+09	nan
59	*2022-06-28 12:00:00	5.19E+10	nan	nan
60	7/10/2022 0:00	5.77E+10	nan	8.09E+08
61	7/9/2022 18:00	2.55E+10	3.90E+09	nan
62	7/9/2022 12:00	3.17E+10	1.02E+10	1.08E+08
63	7/9/2022 0:00	nan	4.24E+09	6.32E+08
64	7/8/2022 18:00	1.63E+10	nan	nan
65	7/8/2022 12:00	1.87E+10	2.47E+09	nan
66	7/8/2022 0:00	nan	nan	4.11E+08
67	7/7/2022 6:00	nan	2.78E+09	3.95E+08
68	7/6/2022 0:00	nan	nan	1.04E+09
69	7/5/2022 18:00	6.88E+10	nan	nan
70	*2022-07-05 12:00:00	5.19E+10	7.55E+09	0.00E+00
71	*2022-07-05 06:00:00	6.07E+10	nan	nan
72	7/5/2022 0:00	5.49E+10	5.84E+09	nan
73	*2022-07-04 18:00:00	nan	2.97E+09	3.77E+08
74	7/4/2022 12:00	2.89E+10	4.87E+09	nan
75	7/13/2022 6:00	4.03E+10	4.75E+08	nan
76	7/10/2022 18:00	3.49E+10	5.90E+09	nan
77	7/10/2022 12:00	4.18E+10	3.44E+09	nan
78	7/10/2022 6:00	nan	3.52E+09	5.12E+08
79	7/18/2022 12:00	nan	9.43E+09	1.12E+09
80	7/18/2022 0:00	4.99E+10	7.84E+09	nan
81	7/17/2022 6:00	nan	4.23E+08	4.48E+08
82	8/8/2022 6:00	nan	nan	4.84E+08
83	*2022-08-05 06:00:00	nan	5.12E+09	8.20E+08
84	*2022-08-20 06:00:00	2.33E+09	2.35E+09	nan
85	8/15/2022 12:00	3.46E+09	2.25E+09	nan
86	8/27/2022 0:00	nan	6.65E+09	nan
87	8/26/2022 18:00	5.78E+10	3.47E+09	nan
88	8/26/2022 12:00	nan	nan	2.65E+08
89	*2022-08-26 06:00:00	3.69E+09	nan	3.11E+08
90	9/1/2022 0:00	2.24E+09	7.28E+08	7.43E+08
91	8/30/2022 12:00	nan	5.41E+08	1.66E+09
92	8/30/2022 0:00	3.63E+09	3.49E+09	nan
93	*2022-09-03 18:00:00	5.67E+09	nan	9.27E+08
94	*2022-09-03 12:00:00	2.14E+09	4.36E+09	nan
95	9/13/2022 6:00	nan	nan	3.36E+08
96	9/14/2022 12:00	1.83E+09	3.11E+08	2.31E+08
97	*2022-09-20 18:00:00	7.17E+09	1.93E+09	nan
98	*2022-09-20 06:00:00	4.37E+09	9.60E+09	2.10E+09
99	9/27/2022 0:00	nan	nan	3.14E+08
100	10/5/2022 6:00	1.58E+10	3.32E+09	nan
101	*2022-10-05 00:00:00	7.02E+09	3.09E+09	nan
102	10/18/2022 0:00	nan	nan	2.41E+08
103	10/25/2022 18:00	9.96E+09	3.37E+09	nan
104	*2022-10-25 12:00:00	5.54E+09	1.07E+09	2.82E+08
105	*2022-10-24 18:00:00	6.45E+09	2.45E+09	nan
106	*2022-10-24 12:00:00	nan	nan	4.26E+08
107	10/23/2022 12:00	1.76E+10	3.40E+09	nan
108	*2022-11-03 12:00:00	nan	nan	4.26E+08
109	*2022-11-03 06:00:00	1.45E+10	nan	nan
110	*2022-10-31 12:00:00	5.81E+09	3.99E+09	nan
111	*2022-11-07 18:00:00	4.57E+11	nan	nan
112	11/4/2022 6:00	1.27E+10	nan	nan
113	12/1/2022 6:00	nan	nan	1.16E+09
114	12/9/2022 6:00	nan	2.46E+09	nan
115	*2022-12-09 00:00:00	nan	2.26E+09	nan
116	12/7/2022 0:00	nan	nan	8.88E+08
117	12/6/2022 18:00	nan	nan	6.44E+08
118	12/6/2022 12:00	nan	2.23E+10	nan
119	*2022-12-06 06:00:00	nan	5.95E+10	nan
120	*2022-12-05 12:00:00	4.03E+10	nan	nan
121	12/5/2022 6:00	1.70E+10	nan	nan
122	12/5/2022 0:00	1.45E+10	nan	nan
123	12/4/2022 18:00	6.81E+10	nan	nan
124	12/12/2022 6:00	nan	2.00E+09	nan
125	12/11/2022 6:00	1.18E+10	nan	nan
126	*2022-12-11 00:00:00	1.52E+10	nan	nan
127	12/20/2022 12:00	2.10E+10	nan	nan
128	*2022-12-20 00:00:00	2.06E+10	nan	nan
129	12/27/2022 0:00	1.25E+10	nan	nan
130	*2022-12-26 00:00:00	1.39E+10	nan	nan
131	*2022-12-25 00:00:00	3.33E+10	nan	nan
132	*2022-12-24 00:00:00	9.26E+10	nan	nan
133	12/22/2022 18:00	nan	3.18E+09	nan
134	12/27/2022 0:00	1.25E+10	nan	nan
135	1/7/2023 0:00	1.39E+10	nan	nan
136	1/6/2023 12:00	1.72E+10	nan	nan
137	1/5/2023 12:00	nan	2.59E+09	nan
138	1/5/2023 6:00	nan	1.76E+09	nan
139	1/1/2023 12:00	1.15E+10	nan	nan
140	1/10/2023 0:00	1.55E+10	nan	nan
141	1/9/2023 0:00	1.16E+10	nan	nan
142	1/8/2023 0:00	1.35E+10	nan	nan
143	1/7/2023 12:00	1.38E+10	nan	nan
144	1/17/2023 12:00	3.28E+10	nan	nan
145	1/14/2023 12:00	2.24E+10	nan	nan
146	1/14/2023 0:00	1.60E+10	nan	nan
147	1/13/2023 18:00	1.59E+10	nan	nan
148	1/13/2023 12:00	1.66E+10	nan	nan
149	1/25/2023 0:00	1.64E+10	nan	nan

150	1/31/2023 0:00	1.16E+10	nan	nan
151	1/30/2023 12:00	1.49E+10	nan	nan
152	1/30/2023 0:00	1.94E+10	nan	nan
153	1/29/2023 12:00	nan	5.76E+09	nan
154	*2023-01-29 06:00:00	nan	1.74E+09	nan
155	*2023-01-29 00:00:00	nan	5.79E+09	nan
156	1/28/2023 12:00	6.27E+10	nan	nan
157	1/28/2023 6:00	2.96E+10	nan	nan
158	1/28/2023 0:00	5.19E+10	nan	nan
159	1/27/2023 18:00	2.00E+10	nan	nan
160	1/27/2023 12:00	7.34E+10	nan	nan
161	1/27/2023 0:00	7.34E+10	nan	nan
162	1/26/2023 18:00	1.32E+10	nan	nan
163	1/26/2023 12:00	1.30E+10	nan	nan
164	1/25/2023 12:00	8.98E+10	nan	nan
165	*2023-02-06 00:00:00	1.67E+10	nan	nan
166	2/4/2023 12:00	1.64E+10	nan	nan
167	2/4/2023 0:00	2.13E+10	nan	nan
168	2/3/2023 18:00	1.82E+10	nan	nan
169	2/3/2023 12:00	2.08E+10	nan	nan
170	2/2/2023 12:00	1.28E+10	nan	nan
171	2/1/2023 12:00	1.24E+10	nan	nan
172	*2023-02-08 00:00:00	2.57E+10	nan	nan
173	*2023-02-06 12:00:00	1.35E+11	nan	nan
174	2/12/2023 12:00	1.23E+10	nan	nan
175	2/23/2023 12:00	9.13E+10	5.35E+10	nan
176	2/23/2023 6:00	2.57E+10	nan	nan
177	2/23/2023 0:00	1.42E+10	nan	nan
178	2/22/2023 0:00	1.30E+10	nan	nan
179	*2023-02-19 12:00:00	2.96E+10	nan	nan
180	2/19/2023 6:00	1.24E+10	nan	nan
181	2/19/2023 0:00	4.18E+10	nan	nan
182	2/18/2023 12:00	2.45E+10	nan	nan
183	*2023-02-28 12:00:00	1.35E+10	nan	nan
184	3/8/2023 0:00	nan	nan	7.33E+08
185	*2023-03-07 18:00:00	nan	nan	5.19E+09
186	*2023-03-07 06:00:00	nan	5.45E+09	nan
187	*2023-03-06 12:00:00	2.15E+10	nan	nan
188	*2023-03-06 06:00:00	2.25E+10	nan	nan
189	3/6/2023 0:00	1.69E+10	nan	nan
190	3/5/2023 12:00	1.26E+10	nan	nan
191	3/20/2023 0:00	3.74E+10	nan	nan
192	3/19/2023 18:00	2.18E+10	nan	nan
193	*2023-03-18 12:00:00	2.58E+10	nan	nan
194	3/24/2023 0:00	nan	2.09E+09	nan
195	3/23/2023 18:00	nan	1.83E+09	nan
196	3/23/2023 12:00	nan	3.94E+09	nan
197	*2023-03-22 12:00:00	nan	3.94E+09	nan
198	3/22/2023 0:00	nan	7.54E+09	nan
199	*2023-03-21 12:00:00	2.09E+10	4.70E+09	nan
200	3/21/2023 6:00	2.91E+10	nan	nan
201	*2023-03-21 00:00:00	7.15E+10	nan	nan
202	3/31/2023 0:00	nan	2.78E+09	nan
203	4/2/2023 18:00	2.44E+10	3.91E+09	5.63E+08
204	4/2/2023 12:00	nan	nan	4.63E+08
205	*2023-04-02 00:00:00	nan	nan	6.26E+09
206	4/10/2023 0:00	3.69E+10	nan	nan
207	4/9/2023 18:00	3.60E+10	nan	nan
208	4/9/2023 12:00	2.11E+10	6.62E+09	nan
209	*2023-04-07 12:00:00	nan	2.53E+09	nan
210	*2023-04-07 00:00:00	nan	3.65E+09	nan
211	4/16/2023 6:00	nan	2.44E+09	nan
212	*2023-04-16 00:00:00	2.42E+10	1.62E+09	nan
213	4/24/2023 0:00	3.39E+10	3.25E+09	nan
214	*2023-04-23 18:00:00	nan	6.91E+09	nan
215	4/23/2023 6:00	3.11E+10	4.94E+09	nan
216	4/23/2023 0:00	3.72E+10	3.47E+09	nan
217	4/22/2023 18:00	nan	2.87E+09	nan
218	4/22/2023 12:00	3.31E+10	nan	nan
219	4/22/2023 6:00	2.88E+10	nan	nan
220	4/22/2023 0:00	2.45E+10	1.69E+09	4.67E+08
221	4/21/2023 18:00	4.56E+10	3.54E+09	nan
222	*2023-04-20 12:00:00	2.35E+10	5.78E+09	nan
223	4/29/2023 12:00	2.38E+10	1.34E+09	nan
224	4/28/2023 18:00	2.76E+10	1.44E+09	2.31E+08
225	4/28/2023 0:00	1.60E+10	6.69E+08	nan
226	4/27/2023 0:00	nan	nan	6.38E+08
227	*2023-04-25 06:00:00	3.56E+10	nan	nan
228	4/24/2023 18:00	1.66E+10	nan	nan
229	*2023-05-06 00:00:00	6.82E+09	5.29E+09	nan
230	5/2/2023 18:00	9.79E+09	nan	3.02E+08
231	5/1/2023 18:00	1.47E+10	1.15E+09	nan
232	5/1/2023 6:00	1.61E+10	1.85E+09	0.00E+00
233	5/1/2023 0:00	1.90E+10	1.82E+09	nan
234	4/30/2023 18:00	2.97E+10	nan	5.55E+08
235	4/30/2023 12:00	2.19E+10	4.51E+09	3.34E+08
236	5/11/2023 0:00	7.37E+09	1.70E+09	nan
237	5/17/2023 0:00	1.16E+10	1.50E+09	nan
238	*2023-05-14 00:00:00	1.33E+10	1.50E+09	nan
239	6/4/2023 0:00	4.17E+10	7.62E+09	0.00E+00
240	6/3/2023 18:00	4.15E+10	2.76E+09	1.63E+10
241	6/2/2023 18:00	8.54E+09	1.24E+09	5.99E+08
242	6/2/2023 12:00	9.01E+09	4.15E+09	4.00E+09

	243	*2023-06-02 00:00:00	5.07E+09	3.38E+09	nan
	244	6/11/2023 0:00	1.94E+10	nan	nan
	245	6/9/2023 0:00	nan	nan	6.16E+08
	246	6/8/2023 18:00	nan	nan	2.58E+08
	247	6/8/2023 12:00	nan	nan	5.70E+09
	248	6/7/2023 18:00	1.85E+10	nan	nan
	249	6/7/2023 12:00	nan	3.85E+09	nan
	250	6/7/2023 0:00	nan	2.96E+09	nan
	251	6/6/2023 18:00	nan	2.24E+09	nan
	252	6/6/2023 12:00	nan	2.14E+09	nan
	253	6/6/2023 6:00	nan	nan	7.03E+08
	254	*2023-06-06 00:00:00	nan	nan	2.14E+09
	255	*2023-06-05 06:00:00	1.72E+10	1.51E+09	nan
	256	6/11/2023 6:00	1.20E+10	nan	nan
	257	7/23/2023 0:00	nan	nan	3.41E+08
	258	7/26/2023 6:00	nan	nan	9.70E+08
	259	7/26/2023 0:00	nan	nan	2.49E+08
	260	7/25/2023 6:00	nan	3.69E+09	6.21E+08
	261	7/25/2023 0:00	1.40E+10	1.57E+09	nan
	262	7/24/2023 18:00	nan	nan	2.48E+09
	263	8/4/2023 6:00	nan	nan	9.80E+08
	264	8/1/2023 12:00	1.01E+10	1.84E+09	nan
	265	8/11/2023 18:00	nan	2.70E+08	1.65E+09
	266	8/11/2023 12:00	2.10E+09	nan	4.82E+08
	267	9/3/2023 12:00	nan	nan	6.84E+08
	268	9/5/2023 18:00	nan	5.84E+08	2.53E+08
	269	9/11/2023 18:00	1.72E+09	nan	6.61E+08
	270	9/11/2023 6:00	nan	nan	5.68E+09
	271	9/19/2023 6:00	nan	nan	3.42E+08
	272	9/19/2023 0:00	4.38E+09	nan	4.63E+08
	273	9/18/2023 18:00	1.88E+09	4.61E+08	2.31E+08
	274	9/17/2023 12:00	nan	nan	2.78E+08
	275	11/2/2023 12:00	2.30E+09	2.30E+08	4.62E+08
	276	11/1/2023 18:00	nan	3.43E+09	nan
	277	10/31/2023 18:00	nan	2.65E+09	nan
	278	10/31/2023 12:00	nan	1.83E+09	nan
	279	10/30/2023 6:00	1.31E+10	3.99E+08	1.62E+08
	280	*2023-12-08 18:00:00	1.19E+10	2.24E+09	nan
	281	12/12/2023 18:00	nan	nan	1.05E+09
	282	*2023-12-11 06:00:00	2.39E+10	nan	nan
	283	*2023-12-10 12:00:00	1.70E+10	7.44E+08	nan
	284	*2023-12-10 06:00:00	1.59E+10	1.13E+09	nan
	285	*2023-12-22 00:00:00	1.62E+10	1.01E+09	nan
	286	12/20/2023 18:00	1.27E+10	1.53E+09	nan
	287	12/17/2023 6:00	1.58E+10	nan	nan
	288	12/17/2023 0:00	1.77E+10	1.03E+09	nan
	289	12/23/2023 18:00	2.28E+10	1.21E+09	nan
	290	12/23/2023 6:00	1.40E+10	nan	nan
	291	12/22/2023 18:00	1.98E+10	3.69E+09	0.00E+00
Any *T*s	1	10/25/2021 0:00	1.91E+09	0.00E+00	0.00E+00
Low	2	*2021-10-23 06:00:00	9.36E+09	0.00E+00	nan
INP	3	*2021-10-22 12:00:00	1.15E+09	0.00E+00	nan
n = 364	4	10/22/2021 6:00	2.13E+09	nan	0.00E+00
	5	10/22/2021 0:00	3.09E+09	nan	0.00E+00
	6	10/28/2021 18:00	3.48E+09	1.13E+09	0.00E+00
	7	10/28/2021 12:00	nan	9.82E+08	0.00E+00
	8	*2021-10-28 06:00:00	1.83E+09	8.98E+08	0.00E+00
	9	10/26/2021 0:00	3.14E+09	0.00E+00	0.00E+00
	10	10/25/2021 12:00	2.95E+09	0.00E+00	0.00E+00
	11	11/6/2021 0:00	2.71E+09	nan	0.00E+00
	12	11/5/2021 18:00	4.59E+08	nan	nan
	13	11/5/2021 12:00	nan	4.42E+07	0.00E+00
	14	11/5/2021 6:00	2.90E+08	nan	0.00E+00
	15	11/5/2021 0:00	3.04E+08	6.39E+07	nan
	16	*2021-11-04 12:00:00	1.42E+09	6.94E+08	0.00E+00
	17	11/3/2021 18:00	1.74E+09	nan	0.00E+00
	18	11/3/2021 12:00	1.12E+09	6.75E+07	0.00E+00
	19	11/3/2021 6:00	1.06E+09	4.90E+08	5.68E+07
	20	11/3/2021 0:00	9.29E+08	nan	1.30E+08
	21	11/2/2021 18:00	0.00E+00	nan	0.00E+00
	22	*2021-11-02 12:00:00	0.00E+00	nan	0.00E+00
	23	10/31/2021 12:00	5.18E+08	nan	0.00E+00
	24	11/11/2021 12:00	nan	0.00E+00	nan
	25	11/11/2021 6:00	1.58E+09	0.00E+00	nan
	26	11/11/2021 0:00	8.37E+09	4.28E+08	0.00E+00
	27	11/10/2021 12:00	7.78E+09	0.00E+00	nan
	28	11/10/2021 6:00	1.03E+10	nan	0.00E+00
	29	*2021-11-09 18:00:00	4.90E+09	0.00E+00	0.00E+00
	30	*2021-11-09 06:00:00	6.98E+09	nan	0.00E+00
	31	*2021-11-07 18:00:00	9.89E+08	1.31E+08	1.29E+08
	32	11/6/2021 6:00	2.59E+09	3.50E+08	0.00E+00
	33	11/17/2021 6:00	nan	nan	0.00E+00
	34	11/17/2021 0:00	0.00E+00	0.00E+00	nan
	35	*2021-11-16 18:00:00	1.18E+09	nan	nan
	36	*2021-11-16 06:00:00	9.00E+08	nan	0.00E+00
	37	*2021-11-12 18:00:00	6.63E+09	nan	0.00E+00
	38	11/23/2021 18:00	nan	2.76E+08	0.00E+00
	39	11/22/2021 18:00	1.73E+09	0.00E+00	nan
	40	11/22/2021 12:00	1.58E+09	0.00E+00	0.00E+00
	41	11/22/2021 6:00	7.10E+08	0.00E+00	nan
	42	11/22/2021 0:00	7.73E+08	0.00E+00	0.00E+00
	43	11/21/2021 18:00	0.00E+00	nan	nan
	44	11/21/2021 12:00	4.02E+08	0.00E+00	0.00E+00

45	11/21/2021 6:00	1.42E+09	0.00E+00	0.00E+00
46	*2021-11-21 00:00:00	9.65E+09	0.00E+00	0.00E+00
47	11/20/2021 18:00	3.70E+09	0.00E+00	nan
48	11/20/2021 6:00	3.03E+09	2.42E+08	0.00E+00
49	*2021-11-20 00:00:00	8.43E+09	4.00E+08	0.00E+00
50	11/30/2021 0:00	nan	0.00E+00	0.00E+00
51	11/29/2021 18:00	0.00E+00	0.00E+00	nan
52	11/29/2021 12:00	9.08E+08	nan	0.00E+00
53	11/29/2021 6:00	0.00E+00	0.00E+00	0.00E+00
54	11/29/2021 0:00	0.00E+00	nan	nan
55	11/28/2021 18:00	0.00E+00	0.00E+00	0.00E+00
56	11/28/2021 12:00	0.00E+00	nan	0.00E+00
57	*2021-11-28 06:00:00	7.88E+08	nan	nan
58	*2021-11-28 00:00:00	1.19E+08	nan	nan
59	11/27/2021 12:00	0.00E+00	0.00E+00	nan
60	11/27/2021 6:00	0.00E+00	0.00E+00	nan
61	11/27/2021 0:00	0.00E+00	nan	0.00E+00
62	11/26/2021 18:00	5.46E+09	0.00E+00	0.00E+00
63	11/26/2021 12:00	0.00E+00	0.00E+00	nan
64	11/26/2021 0:00	0.00E+00	nan	0.00E+00
65	11/25/2021 18:00	0.00E+00	0.00E+00	nan
66	11/25/2021 12:00	7.60E+08	0.00E+00	nan
67	11/25/2021 6:00	nan	nan	0.00E+00
68	11/25/2021 0:00	7.44E+09	0.00E+00	nan
69	11/24/2021 12:00	nan	nan	0.00E+00
70	*2021-12-03 12:00:00	0.00E+00	nan	0.00E+00
71	*2021-12-03 06:00:00	0.00E+00	0.00E+00	nan
72	*2021-12-02 06:00:00	0.00E+00	nan	nan
73	12/2/2021 0:00	nan	0.00E+00	nan
74	12/1/2021 18:00	0.00E+00	0.00E+00	nan
75	12/1/2021 12:00	0.00E+00	0.00E+00	nan
76	12/1/2021 6:00	0.00E+00	0.00E+00	nan
77	12/1/2021 0:00	0.00E+00	nan	0.00E+00
78	11/30/2021 18:00	nan	nan	0.00E+00
79	11/30/2021 12:00	0.00E+00	0.00E+00	nan
80	11/30/2021 6:00	0.00E+00	nan	nan
81	12/18/2021 0:00	0.00E+00	0.00E+00	nan
82	12/17/2021 12:00	2.38E+07	0.00E+00	nan
83	12/17/2021 0:00	1.68E+09	0.00E+00	nan
84	12/16/2021 18:00	1.26E+09	nan	nan
85	12/16/2021 12:00	1.58E+09	0.00E+00	0.00E+00
86	12/16/2021 6:00	0.00E+00	nan	0.00E+00
87	12/15/2021 18:00	0.00E+00	nan	0.00E+00
88	12/15/2021 6:00	0.00E+00	0.00E+00	nan
89	*2021-12-15 00:00:00	0.00E+00	nan	0.00E+00
90	12/20/2021 0:00	nan	nan	0.00E+00
91	12/19/2021 18:00	4.52E+09	nan	0.00E+00
92	12/19/2021 12:00	6.14E+07	nan	0.00E+00
93	12/19/2021 6:00	2.82E+09	nan	0.00E+00
94	12/19/2021 0:00	4.15E+08	nan	0.00E+00
95	12/18/2021 18:00	3.27E+09	0.00E+00	nan
96	12/18/2021 6:00	0.00E+00	1.28E+08	0.00E+00
97	*2021-12-29 18:00:00	nan	nan	0.00E+00
98	12/29/2021 12:00	0.00E+00	nan	nan
99	12/29/2021 6:00	0.00E+00	0.00E+00	0.00E+00
100	12/29/2021 0:00	0.00E+00	nan	0.00E+00
101	*2021-12-28 18:00:00	0.00E+00	nan	0.00E+00
102	12/27/2021 0:00	1.90E+09	0.00E+00	0.00E+00
103	12/26/2021 18:00	7.01E+09	0.00E+00	nan
104	12/26/2021 6:00	2.85E+09	nan	0.00E+00
105	12/26/2021 0:00	1.89E+09	0.00E+00	nan
106	*2022-01-03 18:00:00	0.00E+00	0.00E+00	0.00E+00
107	*2022-01-10 00:00:00	0.00E+00	0.00E+00	nan
108	1/9/2022 18:00	0.00E+00	nan	0.00E+00
109	1/9/2022 6:00	0.00E+00	nan	nan
110	1/9/2022 0:00	0.00E+00	nan	0.00E+00
111	*2022-01-08 18:00:00	0.00E+00	0.00E+00	0.00E+00
112	1/17/2022 0:00	0.00E+00	nan	0.00E+00
113	1/16/2022 18:00	1.49E+08	0.00E+00	nan
114	1/16/2022 12:00	0.00E+00	nan	nan
115	1/16/2022 6:00	0.00E+00	nan	0.00E+00
116	1/16/2022 0:00	4.78E+08	nan	8.29E+07
117	1/15/2022 18:00	0.00E+00	1.47E+08	nan
118	1/15/2022 12:00	0.00E+00	nan	0.00E+00
119	1/15/2022 6:00	0.00E+00	nan	0.00E+00
120	1/15/2022 0:00	3.44E+07	nan	0.00E+00
121	1/14/2022 18:00	4.25E+08	0.00E+00	0.00E+00
122	1/14/2022 12:00	9.91E+08	0.00E+00	0.00E+00
123	1/14/2022 6:00	0.00E+00	0.00E+00	nan
124	1/14/2022 0:00	0.00E+00	0.00E+00	nan
125	1/13/2022 18:00	0.00E+00	0.00E+00	0.00E+00
126	1/13/2022 12:00	0.00E+00	nan	nan
127	*2022-01-13 06:00:00	0.00E+00	nan	nan
128	1/13/2022 0:00	0.00E+00	nan	nan
129	1/12/2022 18:00	0.00E+00	0.00E+00	nan
130	*2022-01-12 12:00:00	1.37E+09	nan	0.00E+00
131	1/23/2022 0:00	nan	0.00E+00	0.00E+00
132	1/22/2022 18:00	0.00E+00	0.00E+00	nan
133	1/22/2022 12:00	0.00E+00	nan	nan
134	1/22/2022 6:00	nan	0.00E+00	0.00E+00
135	1/22/2022 0:00	0.00E+00	0.00E+00	nan
136	1/21/2022 18:00	0.00E+00	nan	nan
137	*2022-01-21 06:00:00	0.00E+00	0.00E+00	0.00E+00

138	1/17/2022 12:00	0.00E+00	nan	nan
139	1/17/2022 6:00	0.00E+00	0.00E+00	nan
140	1/23/2022 6:00	0.00E+00	nan	0.00E+00
141	2/3/2022 12:00	0.00E+00	0.00E+00	nan
142	2/3/2022 6:00	0.00E+00	0.00E+00	nan
143	2/3/2022 0:00	1.68E+09	nan	0.00E+00
144	2/2/2022 18:00	0.00E+00	0.00E+00	nan
145	2/2/2022 12:00	0.00E+00	0.00E+00	nan
146	2/2/2022 6:00	nan	0.00E+00	0.00E+00
147	*2022-02-02 00:00:00	0.00E+00	0.00E+00	0.00E+00
148	*2022-02-01 18:00:00	0.00E+00	nan	0.00E+00
149	2/10/2022 0:00	0.00E+00	0.00E+00	nan
150	2/9/2022 18:00	0.00E+00	0.00E+00	nan
151	2/9/2022 12:00	0.00E+00	nan	0.00E+00
152	2/9/2022 6:00	0.00E+00	nan	0.00E+00
153	2/9/2022 0:00	0.00E+00	nan	nan
154	2/8/2022 18:00	0.00E+00	nan	0.00E+00
155	2/7/2022 6:00	0.00E+00	nan	nan
156	2/7/2022 0:00	0.00E+00	nan	0.00E+00
157	2/6/2022 18:00	0.00E+00	nan	nan
158	*2022-02-06 12:00:00	0.00E+00	0.00E+00	0.00E+00
159	2/10/2022 12:00	0.00E+00	0.00E+00	0.00E+00
160	2/10/2022 6:00	0.00E+00	nan	0.00E+00
161	2/18/2022 12:00	0.00E+00	0.00E+00	nan
162	2/18/2022 6:00	0.00E+00	nan	nan
163	5/8/2022 12:00	nan	1.12E+09	0.00E+00
164	5/7/2022 0:00	1.14E+10	4.54E+08	0.00E+00
165	5/22/2022 12:00	9.79E+09	0.00E+00	0.00E+00
166	5/21/2022 18:00	9.17E+09	1.24E+09	0.00E+00
167	*2022-05-21 06:00:00	7.33E+09	1.17E+09	0.00E+00
168	5/19/2022 6:00	8.49E+09	6.61E+08	0.00E+00
169	5/18/2022 18:00	1.15E+10	nan	0.00E+00
170	5/18/2022 12:00	9.93E+09	0.00E+00	nan
171	5/17/2022 18:00	1.57E+10	0.00E+00	0.00E+00
172	*2022-05-17 06:00:00	1.33E+10	0.00E+00	0.00E+00
173	5/28/2022 6:00	1.06E+10	nan	0.00E+00
174	*2022-05-25 06:00:00	2.35E+09	0.00E+00	nan
175	6/3/2022 18:00	7.99E+09	nan	0.00E+00
176	5/31/2022 12:00	4.96E+09	0.00E+00	nan
177	5/31/2022 6:00	nan	0.00E+00	nan
178	6/7/2022 12:00	1.11E+10	0.00E+00	nan
179	*2022-06-06 18:00:00	2.35E+09	nan	0.00E+00
180	6/5/2022 12:00	2.46E+09	0.00E+00	nan
181	6/5/2022 0:00	9.47E+09	nan	0.00E+00
182	*2022-06-14 00:00:00	0.00E+00	nan	nan
183	6/13/2022 12:00	nan	0.00E+00	0.00E+00
184	6/13/2022 6:00	2.33E+09	0.00E+00	0.00E+00
185	*2022-06-13 00:00:00	2.61E+10	0.00E+00	0.00E+00
186	6/19/2022 12:00	6.64E+09	4.15E+08	0.00E+00
187	6/19/2022 6:00	2.19E+09	1.09E+09	0.00E+00
188	*2022-06-19 00:00:00	0.00E+00	0.00E+00	1.29E+09
189	6/16/2022 12:00	nan	nan	0.00E+00
190	*2022-07-12 06:00:00	nan	1.03E+09	0.00E+00
191	*2022-07-16 12:00:00	1.44E+09	7.20E+08	nan
192	8/9/2022 0:00	nan	nan	0.00E+00
193	8/8/2022 18:00	1.03E+09	0.00E+00	nan
194	8/8/2022 12:00	1.26E+09	nan	nan
195	8/8/2022 0:00	8.08E+08	nan	nan
196	*2022-08-07 18:00:00	2.63E+09	0.00E+00	0.00E+00
197	8/15/2022 0:00	6.70E+08	6.82E+08	0.00E+00
198	*2022-08-20 00:00:00	9.96E+08	0.00E+00	nan
199	*2022-08-19 18:00:00	1.52E+09	nan	0.00E+00
200	8/19/2022 12:00	nan	0.00E+00	0.00E+00
201	8/19/2022 0:00	nan	nan	0.00E+00
202	8/18/2022 18:00	8.69E+08	4.46E+08	nan
203	8/18/2022 12:00	1.25E+09	nan	0.00E+00
204	8/18/2022 0:00	5.91E+08	0.00E+00	nan
205	8/17/2022 18:00	2.15E+09	0.00E+00	0.00E+00
206	8/17/2022 12:00	1.62E+09	nan	0.00E+00
207	8/17/2022 6:00	nan	nan	0.00E+00
208	8/16/2022 18:00	2.15E+09	0.00E+00	0.00E+00
209	8/16/2022 6:00	1.46E+09	0.00E+00	nan
210	8/16/2022 0:00	nan	5.41E+08	0.00E+00
211	8/15/2022 18:00	nan	nan	0.00E+00
212	8/26/2022 0:00	0.00E+00	1.01E+09	nan
213	9/2/2022 0:00	1.40E+09	3.68E+08	1.86E+08
214	9/1/2022 12:00	2.16E+09	0.00E+00	nan
215	8/31/2022 18:00	nan	0.00E+00	nan
216	8/31/2022 12:00	8.52E+08	0.00E+00	nan
217	8/31/2022 6:00	nan	nan	0.00E+00
218	8/31/2022 0:00	0.00E+00	0.00E+00	nan
219	8/29/2022 18:00	1.42E+09	nan	0.00E+00
220	9/7/2022 12:00	1.12E+09	nan	nan
221	9/7/2022 6:00	5.56E+08	0.00E+00	nan
222	*2022-09-07 00:00:00	7.35E+08	0.00E+00	nan
223	9/6/2022 12:00	5.87E+08	2.11E+08	0.00E+00
224	9/6/2022 6:00	1.19E+09	3.30E+08	nan
225	*2022-09-05 18:00:00	1.02E+09	nan	nan
226	9/4/2022 12:00	1.78E+08	1.09E+09	1.81E+08
227	*2022-09-04 00:00:00	1.37E+09	1.04E+09	0.00E+00
228	*2022-09-03 00:00:00	1.94E+10	0.00E+00	0.00E+00
229	9/2/2022 6:00	9.00E+08	2.29E+08	nan
230	9/14/2022 0:00	7.70E+08	3.22E+08	nan

231	9/13/2022 18:00	1.14E+09	3.29E+08	nan
232	*2022-09-12 12:00:00	1.72E+09	4.22E+08	0.00E+00
233	9/12/2022 0:00	2.60E+08	7.91E+08	nan
234	9/11/2022 12:00	1.45E+09	0.00E+00	1.42E+09
235	*2022-09-09 06:00:00	4.19E+08	nan	nan
236	*2022-09-09 00:00:00	5.96E+08	8.63E+08	0.00E+00
237	*2022-09-08 18:00:00	nan	nan	0.00E+00
238	*2022-09-17 00:00:00	1.30E+09	2.24E+08	nan
239	*2022-09-16 12:00:00	1.25E+09	0.00E+00	1.42E+08
240	9/16/2022 0:00	1.03E+09	1.55E+08	nan
241	9/15/2022 18:00	1.37E+09	4.27E+08	nan
242	9/15/2022 12:00	1.38E+09	nan	3.84E+07
243	9/15/2022 6:00	8.96E+08	1.67E+08	nan
244	9/15/2022 0:00	1.04E+09	1.76E+08	nan
245	9/14/2022 18:00	1.31E+09	nan	nan
246	9/14/2022 6:00	1.05E+09	2.50E+08	nan
247	9/25/2022 12:00	1.71E+09	0.00E+00	nan
248	9/23/2022 18:00	4.30E+08	2.19E+08	nan
249	9/23/2022 12:00	nan	0.00E+00	nan
250	9/23/2022 6:00	2.21E+09	8.50E+08	0.00E+00
251	9/23/2022 0:00	nan	nan	0.00E+00
252	9/22/2022 18:00	1.20E+09	0.00E+00	nan
253	9/22/2022 12:00	2.43E+09	0.00E+00	0.00E+00
254	9/22/2022 6:00	nan	4.35E+08	0.00E+00
255	*2022-09-22 00:00:00	nan	nan	0.00E+00
256	10/2/2022 0:00	nan	2.89E+08	0.00E+00
257	9/30/2022 6:00	1.44E+09	4.28E+08	nan
258	9/29/2022 18:00	1.44E+09	3.16E+08	1.03E+08
259	9/29/2022 6:00	6.00E+08	2.08E+08	nan
260	9/29/2022 0:00	1.24E+09	nan	nan
261	9/28/2022 18:00	nan	2.03E+08	0.00E+00
262	9/28/2022 0:00	nan	5.96E+08	0.00E+00
263	9/27/2022 12:00	nan	nan	0.00E+00
264	9/26/2022 18:00	1.54E+09	nan	0.00E+00
265	*2022-10-03 00:00:00	nan	1.49E+09	0.00E+00
266	10/2/2022 6:00	3.55E+09	nan	0.00E+00
267	10/18/2022 18:00	1.88E+09	7.87E+08	0.00E+00
268	10/18/2022 6:00	4.69E+09	1.75E+08	0.00E+00
269	10/17/2022 18:00	1.29E+09	7.80E+07	7.95E+07
270	10/17/2022 0:00	1.23E+09	8.38E+07	0.00E+00
271	10/16/2022 18:00	1.28E+09	2.54E+08	4.47E+07
272	*2022-10-16 00:00:00	nan	nan	0.00E+00
273	10/28/2022 12:00	4.23E+09	9.32E+08	0.00E+00
274	10/28/2022 6:00	5.23E+09	nan	0.00E+00
275	10/28/2022 0:00	2.98E+09	0.00E+00	0.00E+00
276	*2022-10-27 00:00:00	1.29E+09	nan	0.00E+00
277	*2022-10-26 18:00:00	nan	nan	0.00E+00
278	10/26/2022 12:00	1.16E+09	nan	0.00E+00
279	10/26/2022 6:00	3.18E+09	3.70E+08	0.00E+00
280	10/26/2022 0:00	2.15E+09	nan	0.00E+00
281	10/24/2022 6:00	nan	nan	0.00E+00
282	*2022-11-03 00:00:00	nan	nan	0.00E+00
283	11/22/2022 0:00	nan	nan	0.00E+00
284	11/21/2022 12:00	nan	nan	0.00E+00
285	*2022-12-04 00:00:00	nan	nan	0.00E+00
286	*2022-12-03 18:00:00	nan	nan	0.00E+00
287	12/4/2022 12:00	nan	nan	0.00E+00
288	12/4/2022 6:00	nan	nan	0.00E+00
289	*2023-02-09 18:00:00	9.39E+08	nan	nan
290	2/13/2023 6:00	6.18E+08	nan	nan
291	2/13/2023 0:00	1.40E+09	nan	nan
292	2/21/2023 12:00	1.39E+09	nan	nan
293	*2023-02-21 06:00:00	6.55E+08	nan	nan
294	3/1/2023 6:00	1.46E+09	nan	nan
295	3/3/2023 6:00	1.27E+09	nan	nan
296	3/2/2023 18:00	1.18E+09	nan	nan
297	3/2/2023 6:00	1.43E+09	nan	nan
298	4/29/2023 6:00	nan	nan	0.00E+00
299	4/28/2023 6:00	nan	1.22E+09	0.00E+00
300	4/27/2023 12:00	nan	nan	0.00E+00
301	*2023-05-05 18:00:00	8.32E+09	0.00E+00	nan
302	5/1/2023 12:00	nan	nan	0.00E+00
303	5/7/2023 0:00	nan	nan	0.00E+00
304	5/6/2023 12:00	8.82E+08	nan	0.00E+00
305	6/3/2023 12:00	nan	1.49E+09	0.00E+00
306	6/2/2023 6:00	4.04E+09	nan	0.00E+00
307	6/10/2023 12:00	0.00E+00	0.00E+00	nan
308	6/9/2023 12:00	nan	0.00E+00	nan
309	6/9/2023 6:00	nan	nan	0.00E+00
310	*2023-07-22 06:00:00	0.00E+00	nan	nan
311	7/29/2023 18:00	1.22E+09	3.25E+08	nan
312	7/29/2023 0:00	1.31E+09	nan	nan
313	7/28/2023 6:00	nan	2.55E+08	0.00E+00
314	*2023-08-04 18:00:00	2.20E+09	0.00E+00	nan
315	8/9/2023 12:00	3.13E+08	4.04E+07	nan
316	8/9/2023 6:00	2.44E+08	1.52E+07	nan
317	8/9/2023 0:00	5.27E+08	1.77E+07	nan
318	8/8/2023 18:00	3.70E+08	3.38E+07	nan
319	8/8/2023 0:00	3.38E+08	nan	nan
320	8/7/2023 18:00	1.37E+09	nan	4.75E+07
321	8/7/2023 6:00	7.04E+08	nan	nan
322	8/5/2023 6:00	nan	nan	0.00E+00
323	*2023-08-15 00:00:00	5.91E+08	2.90E+08	nan

324	*2023-08-14 18:00:00	nan	3.78E+08	0.00E+00
325	8/11/2023 6:00	nan	0.00E+00	nan
326	8/27/2023 18:00	nan	nan	0.00E+00
327	8/27/2023 12:00	1.16E+09	1.47E+08	nan
328	8/26/2023 12:00	4.89E+08	6.41E+08	nan
329	8/26/2023 6:00	nan	nan	0.00E+00
330	8/25/2023 12:00	6.74E+08	7.29E+08	nan
331	8/25/2023 6:00	nan	nan	0.00E+00
332	9/3/2023 18:00	4.40E+09	nan	0.00E+00
333	*2023-08-30 12:00:00	4.84E+09	1.24E+09	0.00E+00
334	9/7/2023 12:00	nan	0.00E+00	0.00E+00
335	9/7/2023 0:00	6.18E+08	4.14E+08	nan
336	9/6/2023 18:00	nan	3.88E+08	0.00E+00
337	*2023-09-05 12:00:00	5.51E+09	0.00E+00	nan
338	9/16/2023 0:00	6.60E+08	1.65E+08	0.00E+00
339	9/15/2023 18:00	2.09E+08	nan	0.00E+00
340	*2023-09-14 12:00:00	nan	nan	0.00E+00
341	9/12/2023 0:00	6.19E+08	nan	nan
342	*2023-09-11 12:00:00	1.84E+09	0.00E+00	nan
343	9/10/2023 12:00	1.42E+09	3.61E+08	nan
344	9/17/2023 6:00	1.01E+09	nan	nan
345	9/16/2023 18:00	1.89E+09	0.00E+00	nan
346	9/16/2023 12:00	1.27E+09	nan	nan
347	9/16/2023 6:00	1.24E+09	nan	0.00E+00
348	11/1/2023 6:00	1.07E+09	3.03E+08	nan
349	10/31/2023 6:00	nan	nan	0.00E+00
350	10/30/2023 0:00	1.32E+09	nan	nan
351	11/4/2023 6:00	nan	nan	0.00E+00
352	11/4/2023 0:00	2.97E+09	0.00E+00	0.00E+00
353	12/13/2023 6:00	nan	7.82E+08	0.00E+00
354	12/13/2023 0:00	nan	nan	0.00E+00
355	12/12/2023 0:00	5.18E+09	0.00E+00	nan
356	12/11/2023 18:00	6.16E+09	0.00E+00	nan
357	12/11/2023 12:00	nan	0.00E+00	nan
358	12/21/2023 6:00	8.99E+09	1.68E+09	0.00E+00
359	*2023-12-26 06:00:00	5.05E+09	6.66E+08	0.00E+00
360	12/24/2023 18:00	1.08E+09	9.46E+07	nan
361	12/24/2023 6:00	4.39E+09	2.07E+08	0.00E+00
362	12/31/2023 12:00	4.40E+09	0.00E+00	
363	12/31/2023 6:00	nan	nan	0.00E+00
364	12/31/2023 0:00	6.40E+09	0.00E+00	0.00E+00

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