

PHLX Nonstandard Expiration Pilot Program

NDXP

Annual Report

As part of the Pilot Program, the Exchange submits this Pilot Program report to the Commission (the "annual report"). The annual report contains an analysis of volume, open interest and trading patterns. In addition, for series that exceed certain minimum open interest parameters, the annual report will provide analysis of index price volatility and, if needed, share trading activity. The annual report is provided to the Commission on a confidential basis.

To date Nasdaq has not listed any end of month (EOM) nonstandard NDXP options. All NDXP data included in this report reflects only weekly expirations, except 3rd Friday. Data is consolidated across all exchanges that trade the products.

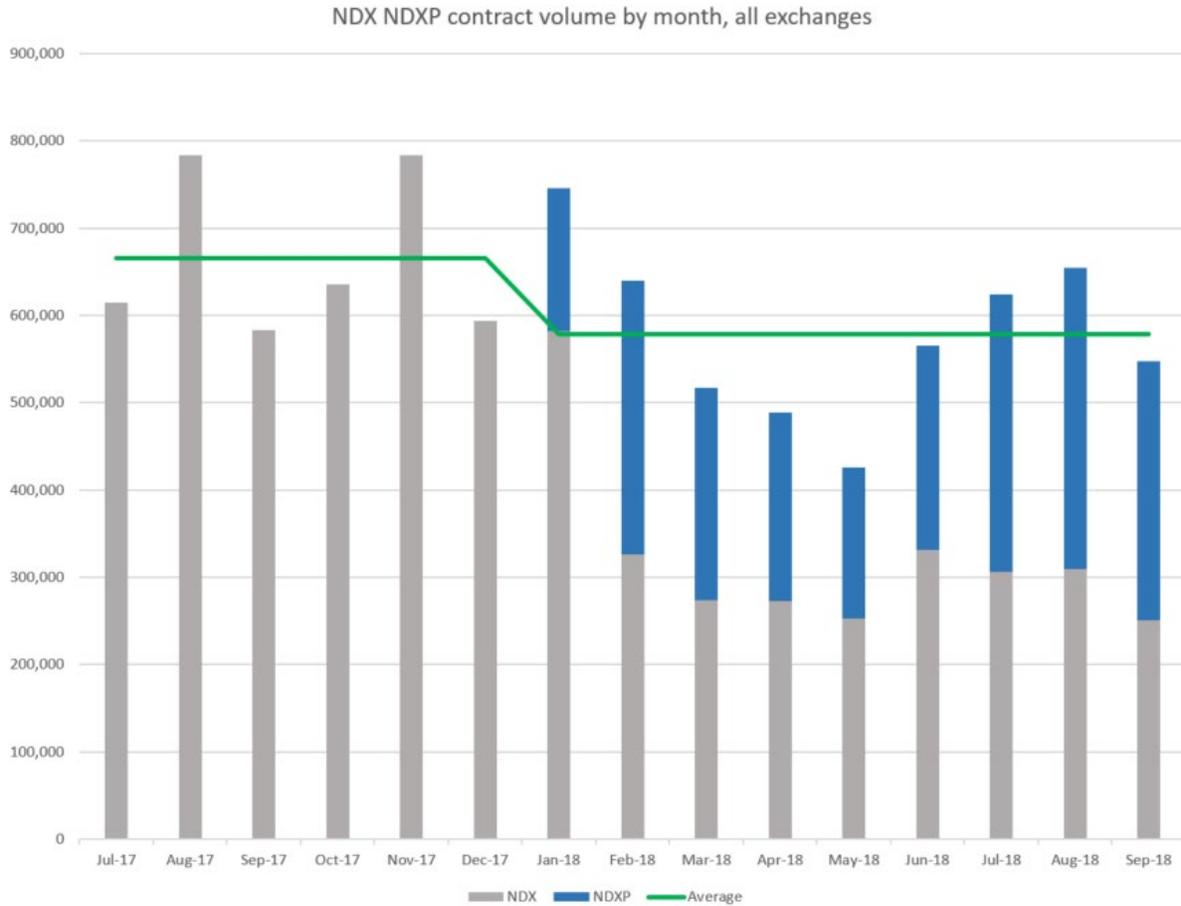
Analysis of Volume and Open Interest

For all weekly nonstandard expirations series (NDXP), this annual report provides volume and open interest data for each broad-based index overlying weekly expiration options.

In addition, the annual report contains the information noted for standard expiration Friday, a.m.-settled series (NDX), for the period covered in the annual report as well as for the six-month period prior to the initiation of the Pilot Program.

(1) Monthly volume aggregated for all Weekly Expiration series

After the introduction of NDXP (January 2018), monthly volume for the class (NDX and NDXP) fell from 665,834 contracts per month to 578,832 contracts per month, a 13% decline.

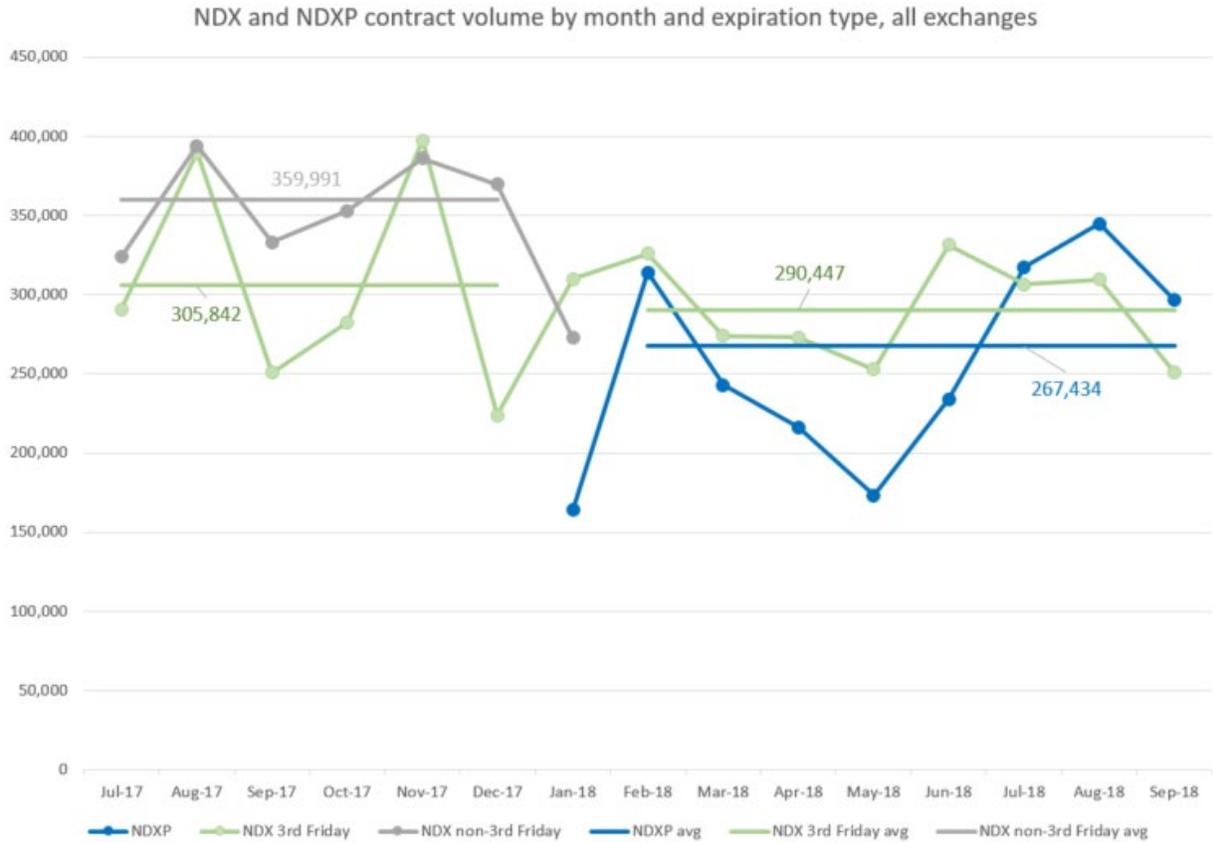


Contract volume by month, all exchanges

| Month | NDX | NDXP | Total | Average |
|--------|---------|---------|---------|---------|
| Jul-17 | 614,878 | 0 | 614,878 | 665,834 |
| Aug-17 | 783,976 | 0 | 783,976 | 665,834 |
| Sep-17 | 583,680 | 0 | 583,680 | 665,834 |
| Oct-17 | 635,576 | 0 | 635,576 | 665,834 |
| Nov-17 | 783,388 | 0 | 783,388 | 665,834 |
| Dec-17 | 593,504 | 0 | 593,504 | 665,834 |
| Jan-18 | 582,456 | 163,990 | 746,446 | 578,832 |
| Feb-18 | 325,908 | 314,060 | 639,968 | 578,832 |
| Mar-18 | 273,912 | 243,016 | 516,928 | 578,832 |
| Apr-18 | 272,914 | 216,280 | 489,194 | 578,832 |
| May-18 | 252,708 | 173,304 | 426,012 | 578,832 |
| Jun-18 | 331,264 | 234,098 | 565,362 | 578,832 |
| Jul-18 | 306,550 | 317,458 | 624,008 | 578,832 |
| Aug-18 | 309,646 | 344,652 | 654,298 | 578,832 |
| Sep-18 | 250,670 | 296,606 | 547,276 | 578,832 |

Volume Jul 1, 2017 - Sep 30, 2018

Before the introduction of NDXP, NDX volume included regular Friday expirations as well as 3rd Friday expirations. Nasdaq discontinued regular Friday expirations of NDX after NDXP was introduced. Regular Friday expirations of NDX averaged 359,991 contracts per month in the 6 months before they were discontinued. Since introduction, NDXP has averaged 267,434 contracts per month, 26% below the level for NDX regular Friday expirations. NDX 3rd Friday expirations also declined from 305,842 contracts per month to 290,447 contracts per month.



Volume Jul 1, 2017 - Sep 30, 2018

NDX and NDXP volume by month, by expiration type, all exchanges

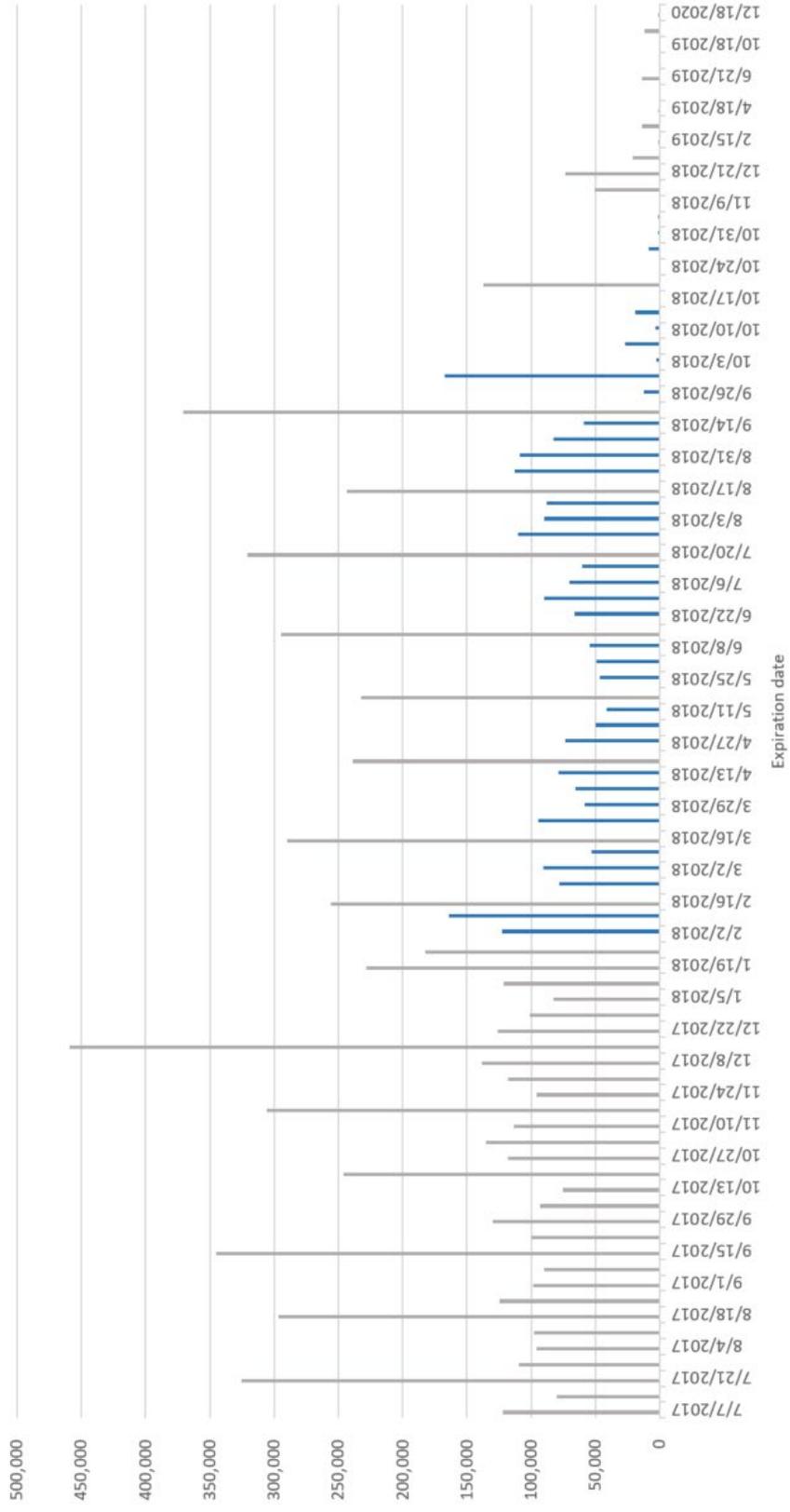
| Month | NDXP | NDX 3rd Friday | NDX non-3rd Friday | Total |
|--------|---------|----------------|--------------------|---------|
| Jul-17 | | 290,888 | 323,990 | 614,878 |
| Aug-17 | | 389,880 | 394,096 | 783,976 |
| Sep-17 | | 250,674 | 333,006 | 583,680 |
| Oct-17 | | 282,576 | 353,000 | 635,576 |
| Nov-17 | | 397,218 | 386,170 | 783,388 |
| Dec-17 | | 223,818 | 369,686 | 593,504 |
| Jan-18 | 163,990 | 309,790 | 272,666 | 746,446 |
| Feb-18 | 314,060 | 325,908 | | 639,968 |
| Mar-18 | 243,016 | 273,912 | | 516,928 |
| Apr-18 | 216,280 | 272,914 | | 489,194 |
| May-18 | 173,304 | 252,708 | | 426,012 |
| Jun-18 | 234,098 | 331,264 | | 565,362 |
| Jul-18 | 317,458 | 306,550 | | 624,008 |
| Aug-18 | 344,652 | 309,646 | | 654,298 |
| Sep-18 | 296,606 | 250,670 | | 547,276 |

Volume Jul 1, 2017 - Sep 30, 2018

(2) Volume in Weekly Expiration series aggregated by expiration date

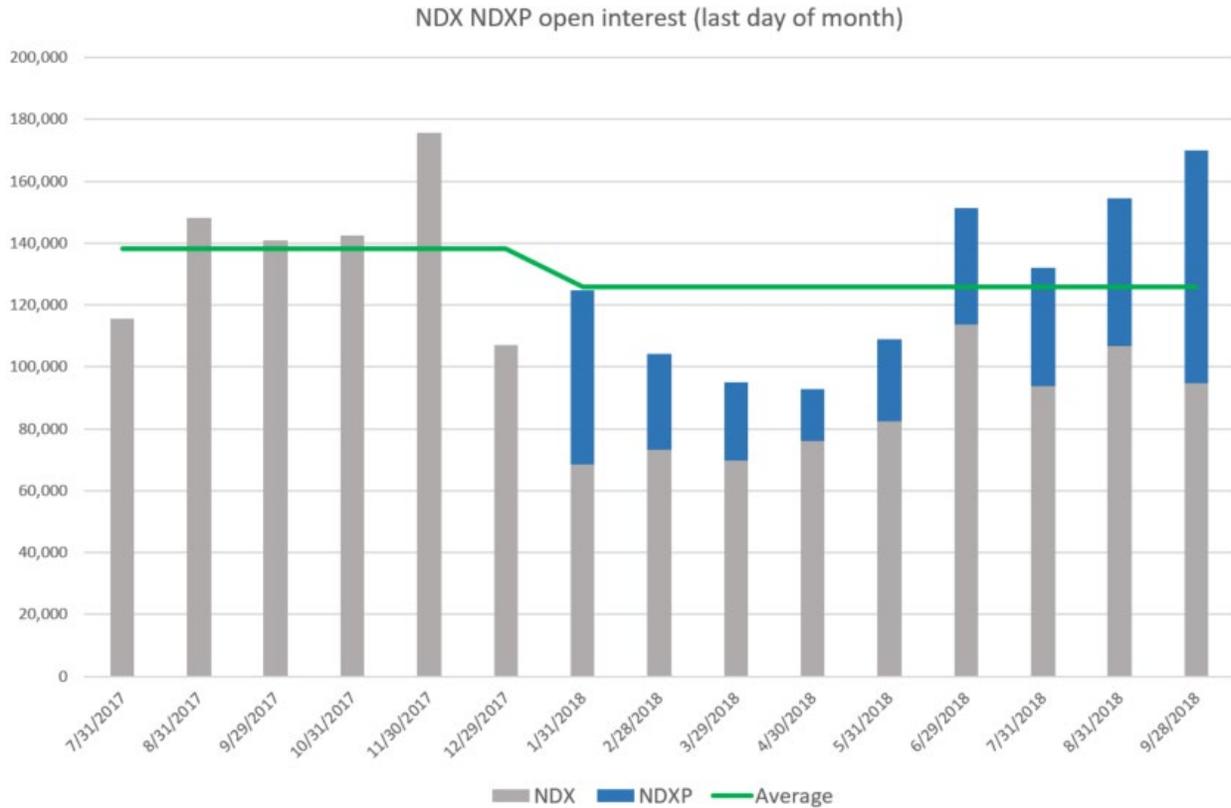
| NDXP contract volume by expiration date | | | NDX 3rd Friday contract volume by expiration date | | | NDX non-3rd Friday contract volume by expiration date | | |
|---|---------|----------------|---|---------|----------------|---|---------|----------------|
| Expiration date | NDXP | Expiration day | Expiration date | NDX | Expiration day | Expiration date | NDX | Expiration day |
| 2/2/2018 | 122,948 | Friday | 7/21/2017 | 325,300 | 3rd Friday | 7/7/2017 | 121,716 | Friday |
| 2/9/2018 | 163,880 | Friday | 8/18/2017 | 296,352 | 3rd Friday | 7/14/2017 | 80,228 | Friday |
| 2/23/2018 | 77,960 | Friday | 9/15/2017 | 345,250 | 3rd Friday | 7/28/2017 | 109,454 | Friday |
| 3/2/2018 | 90,830 | Friday | 10/20/2017 | 246,100 | 3rd Friday | 8/4/2017 | 95,942 | Friday |
| 3/9/2018 | 53,206 | Friday | 11/17/2017 | 305,468 | 3rd Friday | 8/11/2017 | 97,736 | Friday |
| 3/23/2018 | 94,770 | Friday | 12/15/2017 | 459,208 | 3rd Friday | 8/25/2017 | 124,484 | Friday |
| 3/29/2018 | 58,116 | Thursday | 1/19/2018 | 228,008 | 3rd Friday | 9/1/2017 | 98,544 | Friday |
| 4/6/2018 | 65,810 | Friday | 2/16/2018 | 256,190 | 3rd Friday | 9/8/2017 | 90,122 | Friday |
| 4/13/2018 | 78,978 | Friday | 3/16/2018 | 290,100 | 3rd Friday | 9/22/2017 | 99,730 | Friday |
| 4/27/2018 | 73,536 | Friday | 4/20/2018 | 238,940 | 3rd Friday | 9/29/2017 | 129,980 | Friday |
| 5/4/2018 | 49,740 | Friday | 5/18/2018 | 232,476 | 3rd Friday | 10/6/2017 | 93,314 | Friday |
| 5/11/2018 | 41,220 | Friday | 6/15/2018 | 294,288 | 3rd Friday | 10/13/2017 | 75,248 | Friday |
| 5/25/2018 | 46,416 | Friday | 7/20/2018 | 321,010 | 3rd Friday | 10/27/2017 | 117,896 | Friday |
| 6/1/2018 | 49,484 | Friday | 8/17/2018 | 243,408 | 3rd Friday | 11/3/2017 | 135,036 | Friday |
| 6/8/2018 | 54,170 | Friday | 9/21/2018 | 370,976 | 3rd Friday | 11/10/2017 | 113,578 | Friday |
| 6/22/2018 | 66,368 | Friday | 10/19/2018 | 137,166 | 3rd Friday | 11/24/2017 | 95,948 | Friday |
| 6/29/2018 | 90,040 | Friday | 11/16/2018 | 50,640 | 3rd Friday | 12/1/2017 | 118,188 | Friday |
| 7/6/2018 | 69,942 | Friday | 12/21/2018 | 73,508 | 3rd Friday | 12/8/2017 | 138,314 | Friday |
| 7/13/2018 | 60,350 | Friday | 1/18/2019 | 21,136 | 3rd Friday | 12/22/2017 | 126,052 | Friday |
| 7/27/2018 | 110,478 | Friday | 2/15/2019 | 1,558 | 3rd Friday | 12/29/2017 | 100,978 | Friday |
| 8/3/2018 | 90,200 | Friday | 3/15/2019 | 14,066 | 3rd Friday | 1/5/2018 | 82,702 | Friday |
| 8/10/2018 | 88,032 | Friday | 4/18/2019 | 1,024 | 3rd Friday | 1/12/2018 | 121,190 | Friday |
| 8/24/2018 | 112,810 | Friday | 5/17/2019 | 404 | 3rd Friday | 1/26/2018 | 182,438 | Friday |
| 8/31/2018 | 108,782 | Friday | 6/21/2019 | 13,762 | 3rd Friday | | | |
| 9/7/2018 | 82,520 | Friday | 9/20/2019 | 158 | 3rd Friday | | | |
| 9/14/2018 | 58,738 | Friday | 10/18/2019 | 154 | 3rd Friday | | | |
| 9/26/2018 | 12,486 | Wednesday | 12/20/2019 | 11,932 | 3rd Friday | | | |
| 9/28/2018 | 167,618 | Friday | 12/18/2020 | 1,478 | 3rd Friday | | | |
| 10/3/2018 | 2,814 | Wednesday | | | | | | |
| 10/5/2018 | 26,888 | Friday | | | | | | |
| 10/10/2018 | 2,950 | Wednesday | | | | | | |
| 10/12/2018 | 18,792 | Friday | | | | | | |
| 10/17/2018 | 248 | Wednesday | | | | | | |
| 10/24/2018 | 940 | Wednesday | | | | | | |
| 10/26/2018 | 8,402 | Friday | | | | | | |
| 10/31/2018 | 1,320 | Wednesday | | | | | | |
| 11/2/2018 | 1,582 | Friday | | | | | | |
| 11/9/2018 | 100 | Friday | | | | | | |
| Volume Jan 1, 2017 - Sep 30, 2018 | | | Volume Jan 1, 2017 - Sep 30, 2018 | | | Volume Jan 1, 2017 - Sep 30, 2018 | | |

NDX and NDXP contract volume by expiration date



(3) Month-end open interest aggregated for all Weekly Expiration series

After the introduction of NDXP (January 2018), end of month open interest for the class (NDX and NDXP) fell from 138,250 contracts to 125,986 contracts, a 9% decline. Open interest appears to have recovered in recent months.



| Open interest (last day of month) | | | | |
|-----------------------------------|---------|--------|---------|---------|
| Month | NDX | NDXP | Sum | Avg |
| 7/31/2017 | 115,491 | | 115,491 | 138,250 |
| 8/31/2017 | 148,145 | | 148,145 | 138,250 |
| 9/29/2017 | 140,978 | | 140,978 | 138,250 |
| 10/31/2017 | 142,374 | | 142,374 | 138,250 |
| 11/30/2017 | 175,566 | | 175,566 | 138,250 |
| 12/29/2017 | 106,946 | | 106,946 | 138,250 |
| 1/31/2018 | 68,543 | 56,330 | 124,873 | 125,986 |
| 2/28/2018 | 73,287 | 30,879 | 104,166 | 125,986 |
| 3/29/2018 | 69,796 | 25,276 | 95,072 | 125,986 |
| 4/30/2018 | 76,090 | 16,791 | 92,881 | 125,986 |
| 5/31/2018 | 82,429 | 26,626 | 109,055 | 125,986 |
| 6/29/2018 | 113,834 | 37,446 | 151,280 | 125,986 |
| 7/31/2018 | 93,721 | 38,338 | 132,059 | 125,986 |
| 8/31/2018 | 106,741 | 47,646 | 154,387 | 125,986 |
| 9/28/2018 | 94,781 | 75,324 | 170,105 | 125,986 |

(4) Month-end open interest for Weekly Expiration series aggregated by expiration date.

| NDXP month end Open interest by expiration date | | | |
|---|-----------------|---------------|----------------|
| Month | Expiration date | Open interest | Expiration day |
| 1/31/2018 | 2/2/2018 | 30,512 | Friday |
| 1/31/2018 | 2/9/2018 | 20,151 | Friday |
| 1/31/2018 | 2/23/2018 | 2,791 | Friday |
| 1/31/2018 | 3/2/2018 | 2,681 | Friday |
| 1/31/2018 | 3/9/2018 | 195 | Friday |
| 2/28/2018 | 3/2/2018 | 17,327 | Friday |
| 2/28/2018 | 3/9/2018 | 5,364 | Friday |
| 2/28/2018 | 3/23/2018 | 6,007 | Friday |
| 2/28/2018 | 3/29/2018 | 2,019 | Thursday |
| 2/28/2018 | 4/6/2018 | 162 | Friday |
| 3/29/2018 | 3/29/2018 | 9,118 | Thursday |
| 3/29/2018 | 4/6/2018 | 8,202 | Friday |
| 3/29/2018 | 4/13/2018 | 4,826 | Friday |
| 3/29/2018 | 4/27/2018 | 2,694 | Friday |
| 3/29/2018 | 5/4/2018 | 428 | Friday |
| 3/29/2018 | 5/11/2018 | 8 | Friday |
| 4/30/2018 | 5/4/2018 | 10,118 | Friday |
| 4/30/2018 | 5/11/2018 | 4,153 | Friday |
| 4/30/2018 | 5/25/2018 | 1,529 | Friday |
| 4/30/2018 | 6/1/2018 | 871 | Friday |
| 4/30/2018 | 6/8/2018 | 120 | Friday |
| 5/31/2018 | 6/1/2018 | 11,836 | Friday |
| 5/31/2018 | 6/8/2018 | 8,494 | Friday |
| 5/31/2018 | 6/22/2018 | 2,732 | Friday |
| 5/31/2018 | 6/29/2018 | 3,183 | Friday |
| 5/31/2018 | 7/6/2018 | 369 | Friday |
| 5/31/2018 | 7/13/2018 | 12 | Friday |
| 6/29/2018 | 6/29/2018 | 15,734 | Friday |
| 6/29/2018 | 7/6/2018 | 10,748 | Friday |
| 6/29/2018 | 7/13/2018 | 5,325 | Friday |
| 6/29/2018 | 7/27/2018 | 4,297 | Friday |
| 6/29/2018 | 8/3/2018 | 1,307 | Friday |
| 6/29/2018 | 8/10/2018 | 35 | Friday |
| 7/31/2018 | 8/3/2018 | 18,696 | Friday |
| 7/31/2018 | 8/10/2018 | 8,841 | Friday |
| 7/31/2018 | 8/24/2018 | 3,975 | Friday |
| 7/31/2018 | 8/31/2018 | 6,013 | Friday |
| 7/31/2018 | 9/7/2018 | 813 | Friday |
| 8/31/2018 | 8/31/2018 | 18,397 | Friday |
| 8/31/2018 | 9/7/2018 | 13,794 | Friday |
| 8/31/2018 | 9/14/2018 | 5,625 | Friday |
| 8/31/2018 | 9/28/2018 | 8,908 | Friday |
| 8/31/2018 | 10/5/2018 | 861 | Friday |
| 8/31/2018 | 10/12/2018 | 61 | Friday |
| 9/28/2018 | 9/28/2018 | 56,006 | Friday |
| 9/28/2018 | 10/3/2018 | 821 | Wednesday |
| 9/28/2018 | 10/5/2018 | 7,473 | Friday |
| 9/28/2018 | 10/10/2018 | 1,327 | Wednesday |
| 9/28/2018 | 10/12/2018 | 5,086 | Friday |
| 9/28/2018 | 10/17/2018 | 83 | Wednesday |
| 9/28/2018 | 10/24/2018 | 357 | Wednesday |
| 9/28/2018 | 10/26/2018 | 2,948 | Friday |
| 9/28/2018 | 10/31/2018 | 645 | Wednesday |
| 9/28/2018 | 11/2/2018 | 532 | Friday |
| 9/28/2018 | 11/9/2018 | 46 | Friday |

NDX month end Open interest by expiration date (3rd Friday) 2017

| Month | Expiration date | Open interest | Expiration day |
|------------|-----------------|---------------|----------------|
| 7/31/2017 | 8/18/2017 | 24,113 | 3rd Friday |
| 7/31/2017 | 9/15/2017 | 27,981 | 3rd Friday |
| 7/31/2017 | 10/20/2017 | 2,492 | 3rd Friday |
| 7/31/2017 | 11/17/2017 | 456 | 3rd Friday |
| 7/31/2017 | 12/15/2017 | 15,111 | 3rd Friday |
| 7/31/2017 | 3/16/2018 | 1,442 | 3rd Friday |
| 7/31/2017 | 6/15/2018 | 4,039 | 3rd Friday |
| 7/31/2017 | 12/21/2018 | 2,300 | 3rd Friday |
| 7/31/2017 | 12/20/2019 | 550 | 3rd Friday |
| 8/31/2017 | 9/15/2017 | 50,869 | 3rd Friday |
| 8/31/2017 | 10/20/2017 | 13,347 | 3rd Friday |
| 8/31/2017 | 11/17/2017 | 4,977 | 3rd Friday |
| 8/31/2017 | 12/15/2017 | 17,262 | 3rd Friday |
| 8/31/2017 | 1/19/2018 | 27 | 3rd Friday |
| 8/31/2017 | 3/16/2018 | 2,010 | 3rd Friday |
| 8/31/2017 | 6/15/2018 | 4,338 | 3rd Friday |
| 8/31/2017 | 12/21/2018 | 2,370 | 3rd Friday |
| 8/31/2017 | 12/20/2019 | 689 | 3rd Friday |
| 9/29/2017 | 10/20/2017 | 26,116 | 3rd Friday |
| 9/29/2017 | 11/17/2017 | 14,929 | 3rd Friday |
| 9/29/2017 | 12/15/2017 | 21,838 | 3rd Friday |
| 9/29/2017 | 1/19/2018 | 733 | 3rd Friday |
| 9/29/2017 | 2/16/2018 | 203 | 3rd Friday |
| 9/29/2017 | 3/16/2018 | 2,439 | 3rd Friday |
| 9/29/2017 | 6/15/2018 | 4,441 | 3rd Friday |
| 9/29/2017 | 12/21/2018 | 2,698 | 3rd Friday |
| 9/29/2017 | 12/20/2019 | 753 | 3rd Friday |
| 10/31/2017 | 11/17/2017 | 34,944 | 3rd Friday |
| 10/31/2017 | 12/15/2017 | 38,954 | 3rd Friday |
| 10/31/2017 | 1/19/2018 | 1,640 | 3rd Friday |
| 10/31/2017 | 2/16/2018 | 572 | 3rd Friday |
| 10/31/2017 | 3/16/2018 | 2,885 | 3rd Friday |
| 10/31/2017 | 4/20/2018 | 88 | 3rd Friday |
| 10/31/2017 | 5/18/2018 | 24 | 3rd Friday |
| 10/31/2017 | 6/15/2018 | 4,523 | 3rd Friday |
| 10/31/2017 | 7/20/2018 | 34 | 3rd Friday |
| 10/31/2017 | 9/21/2018 | 5 | 3rd Friday |
| 10/31/2017 | 12/21/2018 | 3,189 | 3rd Friday |
| 10/31/2017 | 1/18/2019 | 153 | 3rd Friday |
| 10/31/2017 | 12/20/2019 | 804 | 3rd Friday |
| 11/30/2017 | 12/15/2017 | 99,788 | 3rd Friday |
| 11/30/2017 | 1/19/2018 | 7,223 | 3rd Friday |
| 11/30/2017 | 2/16/2018 | 2,958 | 3rd Friday |
| 11/30/2017 | 3/16/2018 | 3,739 | 3rd Friday |
| 11/30/2017 | 4/20/2018 | 152 | 3rd Friday |
| 11/30/2017 | 5/18/2018 | 84 | 3rd Friday |
| 11/30/2017 | 6/15/2018 | 4,648 | 3rd Friday |
| 11/30/2017 | 7/20/2018 | 172 | 3rd Friday |
| 11/30/2017 | 8/17/2018 | 38 | 3rd Friday |
| 11/30/2017 | 9/21/2018 | 72 | 3rd Friday |
| 11/30/2017 | 12/21/2018 | 3,441 | 3rd Friday |
| 11/30/2017 | 1/18/2019 | 203 | 3rd Friday |
| 11/30/2017 | 12/20/2019 | 829 | 3rd Friday |
| 12/29/2017 | 1/19/2018 | 22,687 | 3rd Friday |
| 12/29/2017 | 2/16/2018 | 5,938 | 3rd Friday |
| 12/29/2017 | 3/16/2018 | 8,704 | 3rd Friday |
| 12/29/2017 | 4/20/2018 | 452 | 3rd Friday |
| 12/29/2017 | 5/18/2018 | 143 | 3rd Friday |
| 12/29/2017 | 6/15/2018 | 4,832 | 3rd Friday |
| 12/29/2017 | 7/20/2018 | 195 | 3rd Friday |
| 12/29/2017 | 8/17/2018 | 67 | 3rd Friday |
| 12/29/2017 | 9/21/2018 | 139 | 3rd Friday |
| 12/29/2017 | 10/19/2018 | 6 | 3rd Friday |
| 12/29/2017 | 12/21/2018 | 3,700 | 3rd Friday |
| 12/29/2017 | 1/18/2019 | 275 | 3rd Friday |
| 12/29/2017 | 12/20/2019 | 1,127 | 3rd Friday |

NDX month end Open interest by expiration date (3rd Friday) 2018 Jan-May

| Month | Expiration date | Open interest | Expiration day |
|-----------|-----------------|---------------|----------------|
| 1/31/2018 | 2/16/2018 | 27,891 | 3rd Friday |
| 1/31/2018 | 3/16/2018 | 22,669 | 3rd Friday |
| 1/31/2018 | 4/20/2018 | 3,853 | 3rd Friday |
| 1/31/2018 | 5/18/2018 | 719 | 3rd Friday |
| 1/31/2018 | 6/15/2018 | 5,859 | 3rd Friday |
| 1/31/2018 | 7/20/2018 | 282 | 3rd Friday |
| 1/31/2018 | 8/17/2018 | 130 | 3rd Friday |
| 1/31/2018 | 9/21/2018 | 324 | 3rd Friday |
| 1/31/2018 | 10/19/2018 | 129 | 3rd Friday |
| 1/31/2018 | 11/16/2018 | 38 | 3rd Friday |
| 1/31/2018 | 12/21/2018 | 4,800 | 3rd Friday |
| 1/31/2018 | 1/18/2019 | 503 | 3rd Friday |
| 1/31/2018 | 12/20/2019 | 1,346 | 3rd Friday |
| 2/28/2018 | 3/16/2018 | 40,931 | 3rd Friday |
| 2/28/2018 | 4/20/2018 | 9,311 | 3rd Friday |
| 2/28/2018 | 5/18/2018 | 4,561 | 3rd Friday |
| 2/28/2018 | 6/15/2018 | 8,878 | 3rd Friday |
| 2/28/2018 | 7/20/2018 | 550 | 3rd Friday |
| 2/28/2018 | 8/17/2018 | 247 | 3rd Friday |
| 2/28/2018 | 9/21/2018 | 721 | 3rd Friday |
| 2/28/2018 | 10/19/2018 | 223 | 3rd Friday |
| 2/28/2018 | 11/16/2018 | 70 | 3rd Friday |
| 2/28/2018 | 12/21/2018 | 4,992 | 3rd Friday |
| 2/28/2018 | 1/18/2019 | 1,185 | 3rd Friday |
| 2/28/2018 | 12/20/2019 | 1,618 | 3rd Friday |
| 3/29/2018 | 4/20/2018 | 26,545 | 3rd Friday |
| 3/29/2018 | 5/18/2018 | 12,053 | 3rd Friday |
| 3/29/2018 | 6/15/2018 | 16,271 | 3rd Friday |
| 3/29/2018 | 7/20/2018 | 2,087 | 3rd Friday |
| 3/29/2018 | 8/17/2018 | 1,196 | 3rd Friday |
| 3/29/2018 | 9/21/2018 | 2,357 | 3rd Friday |
| 3/29/2018 | 10/19/2018 | 369 | 3rd Friday |
| 3/29/2018 | 11/16/2018 | 73 | 3rd Friday |
| 3/29/2018 | 12/21/2018 | 5,305 | 3rd Friday |
| 3/29/2018 | 1/18/2019 | 1,590 | 3rd Friday |
| 3/29/2018 | 3/15/2019 | 82 | 3rd Friday |
| 3/29/2018 | 6/21/2019 | 46 | 3rd Friday |
| 3/29/2018 | 12/20/2019 | 1,822 | 3rd Friday |
| 4/30/2018 | 5/18/2018 | 29,138 | 3rd Friday |
| 4/30/2018 | 6/15/2018 | 24,790 | 3rd Friday |
| 4/30/2018 | 7/20/2018 | 5,662 | 3rd Friday |
| 4/30/2018 | 8/17/2018 | 2,113 | 3rd Friday |
| 4/30/2018 | 9/21/2018 | 3,612 | 3rd Friday |
| 4/30/2018 | 10/19/2018 | 520 | 3rd Friday |
| 4/30/2018 | 11/16/2018 | 134 | 3rd Friday |
| 4/30/2018 | 12/21/2018 | 5,684 | 3rd Friday |
| 4/30/2018 | 1/18/2019 | 2,060 | 3rd Friday |
| 4/30/2018 | 3/15/2019 | 323 | 3rd Friday |
| 4/30/2018 | 6/21/2019 | 209 | 3rd Friday |
| 4/30/2018 | 12/20/2019 | 1,727 | 3rd Friday |
| 4/30/2018 | 12/18/2020 | 118 | 3rd Friday |
| 5/31/2018 | 6/15/2018 | 43,176 | 3rd Friday |
| 5/31/2018 | 7/20/2018 | 14,161 | 3rd Friday |
| 5/31/2018 | 8/17/2018 | 4,483 | 3rd Friday |
| 5/31/2018 | 9/21/2018 | 7,608 | 3rd Friday |
| 5/31/2018 | 10/19/2018 | 625 | 3rd Friday |
| 5/31/2018 | 11/16/2018 | 165 | 3rd Friday |
| 5/31/2018 | 12/21/2018 | 6,881 | 3rd Friday |
| 5/31/2018 | 1/18/2019 | 2,642 | 3rd Friday |
| 5/31/2018 | 2/15/2019 | 42 | 3rd Friday |
| 5/31/2018 | 3/15/2019 | 441 | 3rd Friday |
| 5/31/2018 | 4/18/2019 | 1 | 3rd Friday |
| 5/31/2018 | 6/21/2019 | 239 | 3rd Friday |
| 5/31/2018 | 12/20/2019 | 1,802 | 3rd Friday |
| 5/31/2018 | 12/18/2020 | 163 | 3rd Friday |

NDX month end Open interest by expiration date (3rd Friday) 2018 Jun-Sep

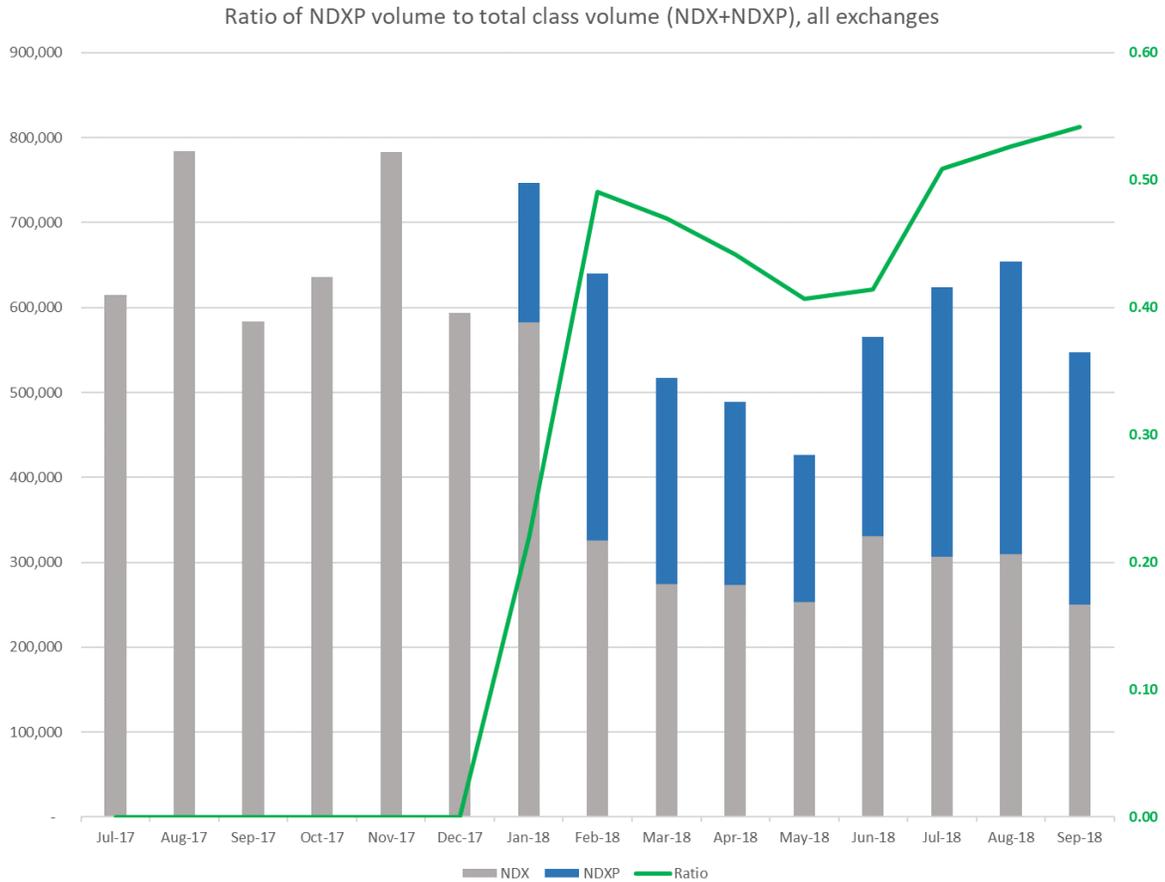
| Month | Expiration date | Open interest | Expiration day |
|-----------|-----------------|---------------|----------------|
| 6/29/2018 | 7/20/2018 | 64,387 | 3rd Friday |
| 6/29/2018 | 8/17/2018 | 13,800 | 3rd Friday |
| 6/29/2018 | 9/21/2018 | 18,862 | 3rd Friday |
| 6/29/2018 | 10/19/2018 | 1,244 | 3rd Friday |
| 6/29/2018 | 11/16/2018 | 539 | 3rd Friday |
| 6/29/2018 | 12/21/2018 | 7,465 | 3rd Friday |
| 6/29/2018 | 1/18/2019 | 3,364 | 3rd Friday |
| 6/29/2018 | 2/15/2019 | 115 | 3rd Friday |
| 6/29/2018 | 3/15/2019 | 814 | 3rd Friday |
| 6/29/2018 | 4/18/2019 | 130 | 3rd Friday |
| 6/29/2018 | 5/17/2019 | 22 | 3rd Friday |
| 6/29/2018 | 6/21/2019 | 597 | 3rd Friday |
| 6/29/2018 | 12/20/2019 | 2,187 | 3rd Friday |
| 6/29/2018 | 12/18/2020 | 308 | 3rd Friday |
| 7/31/2018 | 8/17/2018 | 33,476 | 3rd Friday |
| 7/31/2018 | 9/21/2018 | 33,985 | 3rd Friday |
| 7/31/2018 | 10/19/2018 | 5,665 | 3rd Friday |
| 7/31/2018 | 11/16/2018 | 2,055 | 3rd Friday |
| 7/31/2018 | 12/21/2018 | 8,674 | 3rd Friday |
| 7/31/2018 | 1/18/2019 | 3,597 | 3rd Friday |
| 7/31/2018 | 2/15/2019 | 230 | 3rd Friday |
| 7/31/2018 | 3/15/2019 | 1,059 | 3rd Friday |
| 7/31/2018 | 4/18/2019 | 160 | 3rd Friday |
| 7/31/2018 | 5/17/2019 | 31 | 3rd Friday |
| 7/31/2018 | 6/21/2019 | 1,223 | 3rd Friday |
| 7/31/2018 | 12/20/2019 | 3,111 | 3rd Friday |
| 7/31/2018 | 12/18/2020 | 455 | 3rd Friday |
| 8/31/2018 | 9/21/2018 | 48,820 | 3rd Friday |
| 8/31/2018 | 10/19/2018 | 17,184 | 3rd Friday |
| 8/31/2018 | 11/16/2018 | 10,662 | 3rd Friday |
| 8/31/2018 | 12/21/2018 | 14,992 | 3rd Friday |
| 8/31/2018 | 1/18/2019 | 4,054 | 3rd Friday |
| 8/31/2018 | 2/15/2019 | 358 | 3rd Friday |
| 8/31/2018 | 3/15/2019 | 4,125 | 3rd Friday |
| 8/31/2018 | 4/18/2019 | 290 | 3rd Friday |
| 8/31/2018 | 5/17/2019 | 126 | 3rd Friday |
| 8/31/2018 | 6/21/2019 | 2,211 | 3rd Friday |
| 8/31/2018 | 10/18/2019 | 8 | 3rd Friday |
| 8/31/2018 | 12/20/2019 | 3,292 | 3rd Friday |
| 8/31/2018 | 12/18/2020 | 619 | 3rd Friday |
| 9/28/2018 | 10/19/2018 | 34,310 | 3rd Friday |
| 9/28/2018 | 11/16/2018 | 15,768 | 3rd Friday |
| 9/28/2018 | 12/21/2018 | 22,638 | 3rd Friday |
| 9/28/2018 | 1/18/2019 | 5,051 | 3rd Friday |
| 9/28/2018 | 2/15/2019 | 548 | 3rd Friday |
| 9/28/2018 | 3/15/2019 | 4,765 | 3rd Friday |
| 9/28/2018 | 4/18/2019 | 375 | 3rd Friday |
| 9/28/2018 | 5/17/2019 | 182 | 3rd Friday |
| 9/28/2018 | 6/21/2019 | 5,897 | 3rd Friday |
| 9/28/2018 | 9/20/2019 | 68 | 3rd Friday |
| 9/28/2018 | 10/18/2019 | 72 | 3rd Friday |
| 9/28/2018 | 12/20/2019 | 4,444 | 3rd Friday |
| 9/28/2018 | 12/18/2020 | 663 | 3rd Friday |

NDX month end Open interest by expiration date (non-3rd Friday)

| Month | Expiration date | Open interest | Expiration day |
|------------|-----------------|---------------|----------------|
| 7/31/2017 | 8/4/2017 | 22,646 | Friday |
| 7/31/2017 | 8/11/2017 | 6,450 | Friday |
| 7/31/2017 | 8/25/2017 | 4,257 | Friday |
| 7/31/2017 | 9/1/2017 | 3,485 | Friday |
| 7/31/2017 | 9/8/2017 | 169 | Friday |
| 8/31/2017 | 9/1/2017 | 18,582 | Friday |
| 8/31/2017 | 9/8/2017 | 18,472 | Friday |
| 8/31/2017 | 9/22/2017 | 5,896 | Friday |
| 8/31/2017 | 9/29/2017 | 5,307 | Friday |
| 8/31/2017 | 10/6/2017 | 3,063 | Friday |
| 8/31/2017 | 10/13/2017 | 936 | Friday |
| 9/29/2017 | 9/29/2017 | 27,913 | Friday |
| 9/29/2017 | 10/6/2017 | 21,190 | Friday |
| 9/29/2017 | 10/13/2017 | 9,234 | Friday |
| 9/29/2017 | 10/27/2017 | 3,955 | Friday |
| 9/29/2017 | 11/3/2017 | 3,888 | Friday |
| 9/29/2017 | 11/10/2017 | 648 | Friday |
| 10/31/2017 | 11/3/2017 | 31,436 | Friday |
| 10/31/2017 | 11/10/2017 | 16,405 | Friday |
| 10/31/2017 | 11/24/2017 | 2,454 | Friday |
| 10/31/2017 | 12/1/2017 | 3,856 | Friday |
| 10/31/2017 | 12/8/2017 | 408 | Friday |
| 11/30/2017 | 12/1/2017 | 21,388 | Friday |
| 11/30/2017 | 12/8/2017 | 19,469 | Friday |
| 11/30/2017 | 12/22/2017 | 6,250 | Friday |
| 11/30/2017 | 12/29/2017 | 4,416 | Friday |
| 11/30/2017 | 1/5/2018 | 618 | Friday |
| 11/30/2017 | 1/12/2018 | 78 | Friday |
| 12/29/2017 | 12/29/2017 | 17,780 | Friday |
| 12/29/2017 | 1/5/2018 | 17,445 | Friday |
| 12/29/2017 | 1/12/2018 | 20,212 | Friday |
| 12/29/2017 | 1/26/2018 | 3,244 | Friday |

(5) Ratio of monthly aggregate volume in Weekly Expiration series to total monthly class volume.

Ratio of NDXP volume to total class volume (NDX+NDXP) fluctuated between 40-50% (not including January 2018 when it was 22%), rising just above 50% in September 2018.



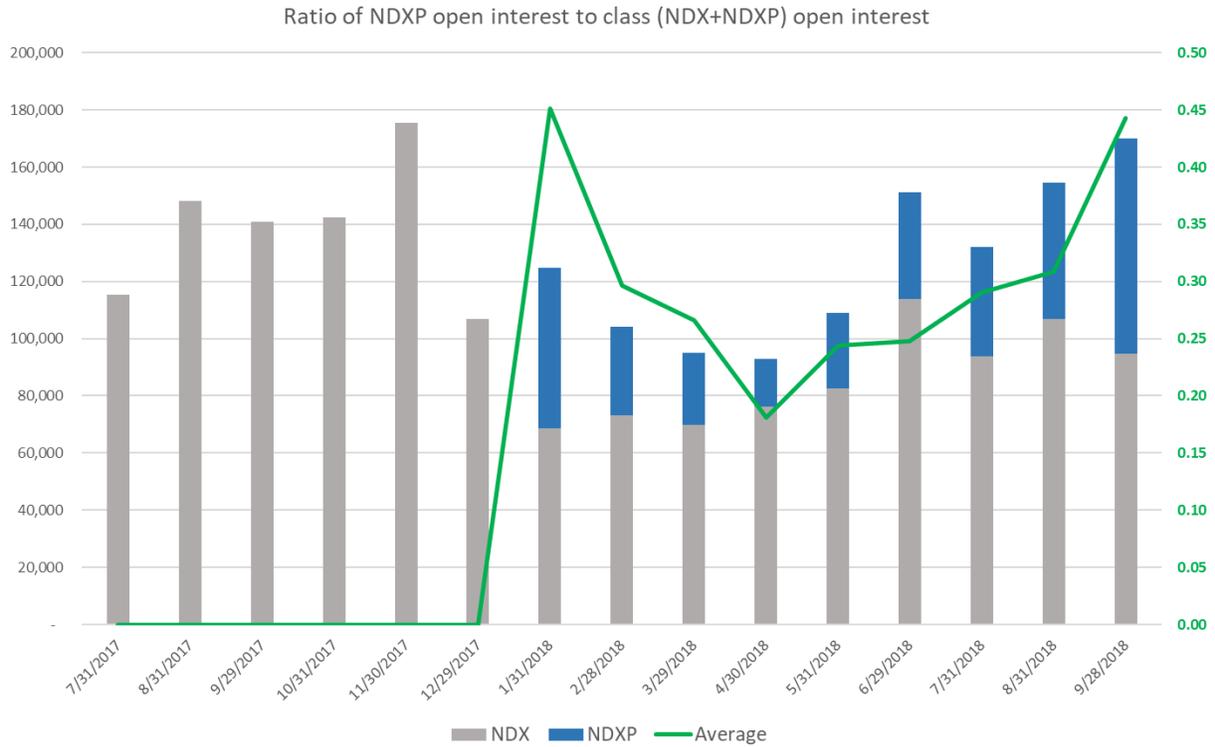
Ratio of NDXP contract volume to class volume

| Month | NDX | NDXP | Sum | Ratio |
|--------|---------|---------|---------|-------|
| Jul-17 | 614,878 | 0 | 614,878 | 0.00 |
| Aug-17 | 783,976 | 0 | 783,976 | 0.00 |
| Sep-17 | 583,680 | 0 | 583,680 | 0.00 |
| Oct-17 | 635,576 | 0 | 635,576 | 0.00 |
| Nov-17 | 783,388 | 0 | 783,388 | 0.00 |
| Dec-17 | 593,504 | 0 | 593,504 | 0.00 |
| Jan-18 | 582,456 | 163,990 | 746,446 | 0.22 |
| Feb-18 | 325,908 | 314,060 | 639,968 | 0.49 |
| Mar-18 | 273,912 | 243,016 | 516,928 | 0.47 |
| Apr-18 | 272,914 | 216,280 | 489,194 | 0.44 |
| May-18 | 252,708 | 173,304 | 426,012 | 0.41 |
| Jun-18 | 331,264 | 234,098 | 565,362 | 0.41 |
| Jul-18 | 306,550 | 317,458 | 624,008 | 0.51 |
| Aug-18 | 309,646 | 344,652 | 654,298 | 0.53 |
| Sep-18 | 250,670 | 296,606 | 547,276 | 0.54 |

Volume Jul 1, 2017 - Sep 30, 2018

(6) Ratio of month-end open interest in each Weekly Expiration series to total class open interest.

Ratio of NDXP open interest to total class open interest (NDX+NDXP) has fluctuated widely, rising to 44% in September 2018.



Ratio of NDXP open interest to class open interest

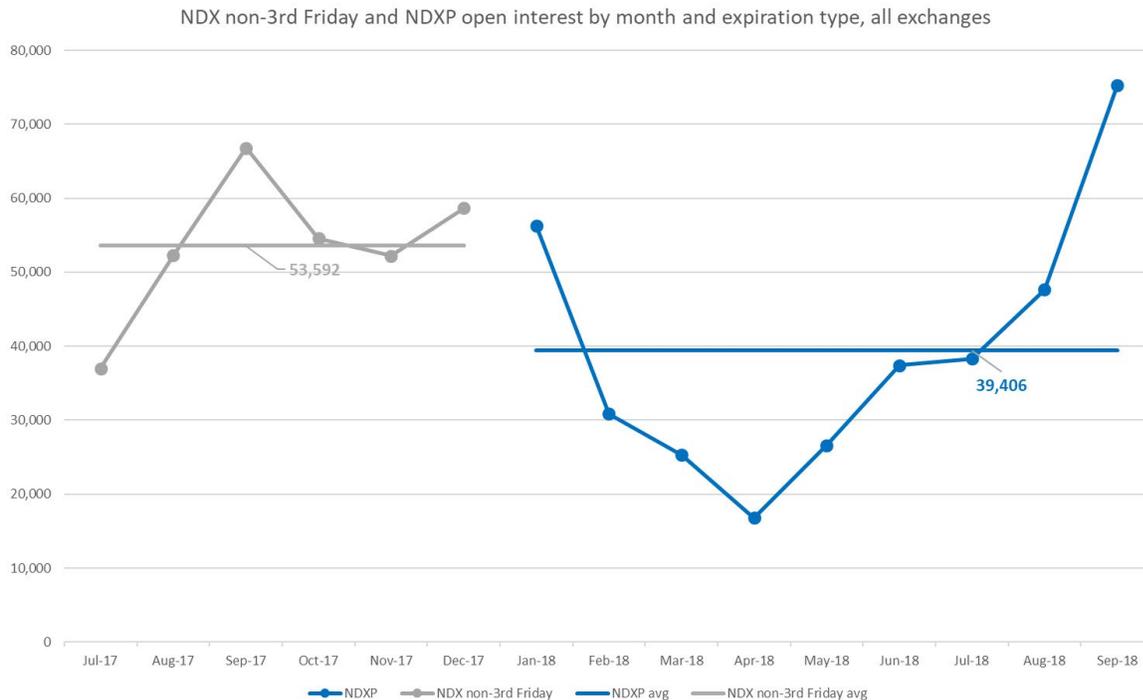
| Month | NDX | NDXP | Sum | Ratio |
|------------|---------|--------|---------|-------|
| 7/31/2017 | 115,491 | | 115,491 | 0.00 |
| 8/31/2017 | 148,145 | | 148,145 | 0.00 |
| 9/29/2017 | 140,978 | | 140,978 | 0.00 |
| 10/31/2017 | 142,374 | | 142,374 | 0.00 |
| 11/30/2017 | 175,566 | | 175,566 | 0.00 |
| 12/29/2017 | 106,946 | | 106,946 | 0.00 |
| 1/31/2018 | 68,543 | 56,330 | 124,873 | 0.45 |
| 2/28/2018 | 73,287 | 30,879 | 104,166 | 0.30 |
| 3/29/2018 | 69,796 | 25,276 | 95,072 | 0.27 |
| 4/30/2018 | 76,090 | 16,791 | 92,881 | 0.18 |
| 5/31/2018 | 82,429 | 26,626 | 109,055 | 0.24 |
| 6/29/2018 | 113,834 | 37,446 | 151,280 | 0.25 |
| 7/31/2018 | 93,721 | 38,338 | 132,059 | 0.29 |
| 8/31/2018 | 106,741 | 47,646 | 154,387 | 0.31 |
| 9/28/2018 | 94,781 | 75,324 | 170,105 | 0.44 |

Monthly Analysis of Weekly Expiration and EOM Trading Patterns

In this annual report, the Exchange analyzed open interest in Weekly Expiration series aggregated by expiration date compared to open interest in near-term standard Expiration Friday a.m.-settled series in order to determine whether users are shifting positions from standard series to Weekly Expiration series. Nasdaq has no data on other weekly p.m. settled products from other exchanges to compare open interest with these options in order to determine whether users are shifting positions from other weekly or monthly p.m.-settled products to the Weekly Expiration series. Declining open interest in standard series or the weekly p.m.-settled products of other exchanges accompanied by rising open interest in Weekly Expiration series would suggest that users are shifting positions.

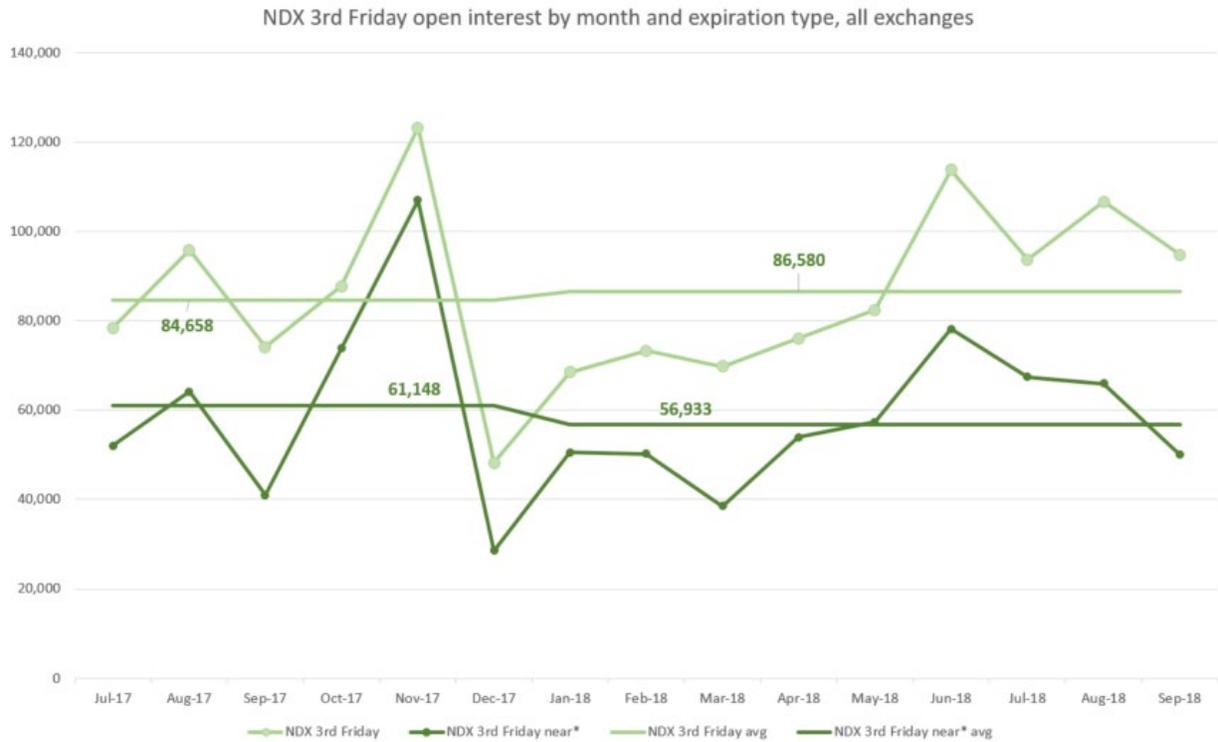
Open interest trends:

After the introduction of NDXP and discontinuation of non-3rd Friday NDX contracts, open interest shifted from NDX regular Friday expirations to NDXP. Average month-end open interest fell from 53,592 contracts in NDX during Jul-Dec 2017 to 39,406 contracts in NDXP during Jan-Sept 2018. NDXP average open interest has grown since hitting a low in April 2018. It passed 70,000 contracts at the end of October 2018.



Open interest in the full range of 3rd Friday NDX contracts has not changed significantly since the introduction of NDXP. Average open interest before the introduction was 84,658 contracts. Open interest after the introduction has been 86,580. Open interest in near-term 3rd Friday NDX contracts

(expiring within 7 weeks) fell slightly after the introduction of NDXP. Month-end open interest in 3rd Friday NDX fell from 61,148 to 56,933 contracts, a 7% decline.



*NDX contracts with expirations within 7 weeks

Clearly users shifted positions from discontinued NDX non-3rd Friday expiration contracts to NDXP. Any shift from 3rd Friday NDX contracts to NDXP is limited at most. First, NDXP does not compete directly with 3rd Friday expirations. Second, NDX 3rd Friday open interest has changed very little since the introduction of NDXP. Third, NDXP average open interest has so far been below the average open interest in NDX non-3rd Friday expiration contracts.

NDX and NDXP open interest at end of month, by expiration type, all exchanges

| Month | NDXP | NDX 3rd Friday | NDX 3rd Friday near* | NDX non-3rd Friday | NDX Total |
|------------|--------|----------------|----------------------|--------------------|-----------|
| 7/31/2017 | | 78,484 | 52,094 | 37,007 | 115,491 |
| 8/31/2017 | | 95,889 | 64,216 | 52,256 | 148,145 |
| 9/29/2017 | | 74,150 | 41,045 | 66,828 | 140,978 |
| 10/31/2017 | | 87,815 | 73,898 | 54,559 | 142,374 |
| 11/30/2017 | | 123,347 | 107,011 | 52,219 | 175,566 |
| 12/29/2017 | | 48,265 | 28,625 | 58,681 | 106,946 |
| 1/31/2018 | 56,330 | 68,543 | 50,560 | | 68,543 |
| 2/28/2018 | 30,879 | 73,287 | 50,242 | | 73,287 |
| 3/29/2018 | 25,276 | 69,796 | 38,598 | | 69,796 |
| 4/30/2018 | 16,791 | 76,090 | 53,928 | | 76,090 |
| 5/31/2018 | 26,626 | 82,429 | 57,337 | | 82,429 |
| 6/29/2018 | 37,446 | 113,834 | 78,187 | | 113,834 |
| 7/31/2018 | 38,338 | 93,721 | 67,461 | | 93,721 |
| 8/31/2018 | 47,646 | 106,741 | 66,004 | | 106,741 |
| 9/28/2018 | 75,324 | 94,781 | 50,078 | | 94,781 |

*NDX contracts with expirations within 7 weeks