

NATIONAL WEATHER SERVICE INSTRUCTION 10-519

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Operations and Services

Public Weather Services, NWSPD 10-5

WFO AIR QUALITY PRODUCTS SPECIFICATION

NOTICE: This publication is available at: <https://www.weather.gov/directives/>.

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WFO Air Quality Products Specification

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1. Introduction

This procedural instruction provides product specifications for external air quality messages relayed by the National Weather Service's (NWS) Weather Forecast Offices (WFOs). This instruction neither changes the method of interactions between NWS and state and local air quality forecasters, nor requires NWS forecasters to initiate messages for state and local air quality forecasters. This instruction provides a standardized template for relaying air quality messages generated by state and local air quality forecasters should they request their local WFOs to do so. Template specifications include the guidelines associated with these products, detailed content, and format for each product type. Air quality alerts and statements are not prepared directly by WFO staff. The function of initiating and issuing air quality messages is performed by state and local air quality forecasters. The NWS' sole function in this process is providing, on request, a means of disseminating these state and locally issued air quality messages.

2. Air Quality Statement (AQI)

The AQI product is used by WFOs to relay routine air quality messages issued by state and local agencies.

2.1 Mission Connection

The AQI is a non-technical product, which relays routine air quality information compiled by state and local air quality agencies. The content of this message varies widely from state to state, and often from jurisdiction to jurisdiction. Some examples of information contained in these messages include:

- a. Pollen Count
- b. Environmental Protection Agency (EPA) Air Quality Index (AQI)
- c. Gross Mold Count
- d. Air Quality Index Code Level for the day (Green, Yellow, Orange, Red)
- e. Source of Pollution (ozone, smoke, particulate matter (PM), etc.)
- f. Sky Condition relating to air pollution-induced haze

WFOs are only responsible for the dissemination of these messages, not the content. Any content issues are relayed to the issuing state or local agency.

2.2 Issuance Guidelines

2.2.1 Creation Software

The AQI should be created using the Advanced Weather Interactive Processing System (AWIPS) Graphical Forecast Editor (GFE) Formatter Launcher application or other text editor.

2.2.2 Issuance Criteria

The AQI product will be relayed by WFOs for all routine air quality messages issued by the state or local agencies within the WFO's area of responsibility per state/local agency agreement. The following guidelines are to be used to delineate a routine and a non-routine product issuance.

2.2.2.1 Routine Issuances

All routine issuances of air quality messages will be disseminated under the AQI product header. A message should be considered routine when it is issued for sub-health-threatening threshold levels or is scheduled such as when:

- a. The EPA's Air Quality Index value is between zero and 100 (see Appendix 1 for color-coded table and explanation of the EPA Air Quality Index)
- b. A "Code Level" or the "Level of Health Concern" is forecast to be Low or Moderate (green or yellow)
- c. The "Skycast" is forecast to be yellow or green
- d. It is issued daily at the request of the local/state air quality agency

Issuing agencies can set higher thresholds for areas which normally experience higher levels of pollutants.

If the above guidelines/thresholds are exceeded, then a non-routine message will be relayed with an Air Quality Alert Message (AQA) product header, which is described in Section 3 of this instruction.

2.2.3 Issuance Time

The issuance time of the AQI varies from WFO to WFO. It is dependent upon the frequency with which state or local agencies issue their messages. In some cases, products will be issued once per day in one WFO, while another WFO may relay hourly messages.

2.2.4 Valid Time

AQIs are valid from time of release until the next release, or as specified by the issuing agency.

2.2.5 Product Expiration Time

AQIs are not required to contain a product expiration time. If the WFO wishes to put an expiration time on the product, it will require coordination with the state and local agency which issues the message.

2.3 Technical Description

AQIs should follow the format and content described in the following section.

2.3.1 Universal Geographic Code (UGC) Type

There is no UGC coding associated with the AQI product.

2.3.2 Mass News Disseminator (MND) Broadcast Instruction Line

There is no MND Broadcast Instruction Line associated with this product.

2.3.3 MND Product Type Line

The MND Product Type of the AQI varies from WFO to WFO and all AQIs will always include the phrase "Relayed by National Weather Service (insert WFO name here)" under

the MND Product Type or issuing agencies.

Some example MND Product Types (determined in collaboration with the issuing state/local agency or agencies) which appear on the AQI are:

- a. Air Quality Forecast
- b. Air Quality Forecast Index
- c. Air Quality Index
- d. Air Quality Index Forecast
- e. Air Quality Index and Skycast
- f. Pollution Index/Pollen Count
- g. Pollutant Standards Index (PSI)
- h. Ground Level Ozone Forecast

2.3.4 Content

As stated previously in this section, the content of the AQI will be determined by the issuing state or local agency. The WFO’s sole purpose is to serve as a dissemination means for these routine air quality messages. Changes in content need to be coordinated with the issuing agency or agencies.

FXaaii cccc ddhhmm AQIxxx	<i>WMO heading (AEUS7x)</i> <i>AWIPS Identifier</i>
<u>Product Format</u>	<u>Description of Entry</u>
PRODUCT HEADER (see section 2 for examples)	<i>(MND/NWS Product Name)</i>
NAME(S) OF AGENCY (AGENCIES) ISSUING MESSAGE (optional)	<i>(Issuing Agency or Agencies)</i>
RELAYED BY NATIONAL WEATHER SERVICE city state	<i>(Issuing Office)</i>
time am/pm time_zone day mon dd yyyy	<i>(Issuing Time/Date)</i>
...[headline to highlight any relevant forecast information]...	<i>(Topical Headline - Optional)</i>
[Content to be defined by issuing agency or agencies]	
## or \$\$	

Figure 1. Air Quality Statement (AQI) Product Format.

2.4 Updates and Corrections

Any updates or corrections to the AQI will be issued by the issuing state or local agency, or need to be coordinated with the issuing agency.

3. Air Quality Alert Message (AQA)

The AQA product is used by the WFOs to relay non- routine air quality alert messages issued by state and local agencies.

3.1 Mission Connection

The AQA is a non-technical product, which relays non-routine air quality alerts and information compiled by state and local air quality agencies. As with the AQI product, the content of these messages, as well as the type of alerts, varies widely from state to

state, and often from jurisdiction to jurisdiction.

3.2 Issuance Guidelines

3.2.1 Creation Software

The AQA should be created using the AWIPS GFE Formatter Launcher application.

3.2.2 Issuance Criteria

The AQA product will be relayed by the WFOs for all requested non-routine air quality alert messages issued by the state or local agencies within the WFO's area of responsibility. The following guidelines are to be used to delineate a non-routine product issuance (routine product issuances are discussed in Section 2.2.2.1).

3.2.2.1 Non-Routine Issuances

All non-routine issuances of air quality alert messages will be disseminated under the AQA product header. A message should be considered non-routine whenever any of the following conditions are met:

- a. A product received from the issuing agency contains a headline indicating that a watch/advisory/alert/warning is in effect
- b. The EPA's Air Quality Index value is at least 101 or higher. Values at or above 101 is considered unhealthy for Sensitive Groups - please see Appendix 1 at A-5 (Figure 3) for a color-coded table and an explanation of the EPA Air Quality Index. The "Code Level" or the "Level of Health Concern" is forecast to be Code Orange or higher
- c. The "Skycast" is forecast to be red

Issuing agencies can set higher thresholds for areas, which normally experience higher levels of pollutants. In addition, other unique alert thresholds from state and local agencies may also be utilized to trigger NWS AQA messages to meet local user needs.

3.2.3 Issuance Time

The issuance time of the AQA varies from WFO to WFO. It is dependent upon the frequency with which state or local agencies issue their messages.

3.2.4 Valid Time

AQAs are valid from time of release until the next release, or, until the alert is no longer in effect.

3.2.5 Product Expiration Time

State or local air quality officials should designate the product expiration time of the air quality alert message. If not designated, WFOs should coordinate with state or local air quality agencies to determine an expiration time.

3.3 Technical Description

AQAs should follow the format and content described in the following section.

3.3.1 UGC Type

All WFOs are to use zone coding as the UGC coding for the AQA product.

3.3.2 MND Broadcast Instruction Line

There is no MND Broadcast Instruction Line associated with this product.

3.3.3 MND Product Type Line and Headline

The MND Product Type of the AQA will always be “Air Quality Alert Message,” and will also include the phrase “Relayed by National Weather Service (insert WFO name here)” under the MND Product Type or issuing agencies. The headline for the AQA product will contain wording determined by the issuing state or local agency or agencies. Some examples of wording that headlines can contain are:

- a. Ozone Alert
- b. Ozone Warning
- c. Air Quality Health Alert
- d. Air Quality Watch
- e. Air Quality Warning
- f. Air Quality Advisory
- g. Ozone Action Day
- h. EPA Air Quality Warning
- i. Air Quality Action Day

3.3.4 Content

As stated previously in this section, the content of the AQA will be determined by the issuing state or local agency. The WFO’s sole purpose is to serve as the dissemination means for these non-routine air quality messages. Changes in content need to be coordinated with the issuing agency or agencies.

FXaaii cccc ddhhmm AQAxXX st##...-ddhhmm- <u>Product Format</u> AIR QUALITY ALERT MESSAGE NAME(S) OF AGENCY (AGENCIES) ISSUING MESSAGE RELAYED BY NATIONAL WEATHER SERVICE city state time am/pm time _zone day mon dd yyyy ...[headline to highlight alert/watch/warning in effect] ... [Content to be defined by issuing agency or agencies] ## or \$\$	<i>WMO heading (AEUS7x)</i> <i>AWIPS Identifier</i> <i>UGC zone coding/expiration time</i> <u>Description of Entry</u> (<i>MND/NWS Product Name</i>) (<i>Issuing Agency or Agencies</i>) (<i>Issuing Office</i>) (<i>Issuing Time/Date</i>) (<i>Topical Headline</i>)
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Figure 2. Air Quality Alert Message (AQA) Product Format.

3.4 Updates and Corrections

Any updates or corrections to the AQA will be issued by the issuing state or local agency, or need to be coordinated with the issuing agency.

APPENDIX 1 – Product Examples and Air Quality Resources

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1. Air Quality Statement (AQI) Examples

a. Issuance with Expiration Time (time of next scheduled issuance):

AEUS74 KSHV 092227
AQISHV
LAZ001-100230-

AIR QUALITY INDEX
RELAYED BY NATIONAL WEATHER SERVICE SHREVEPORT LA
427 PM CST WED MAR 9 2022

THE AIR QUALITY INDEX FOR TODAY FOR SHREVEPORT WAS 19...
WHICH WAS IN THE GOOD CATEGORY.

CATEGORIES:
0 - 50 = GOOD
51 - 100 = MODERATE
101 - 200 = UNHEALTHFUL
201 - 300 = VERY UNHEALTHFUL
301 - 500 = EXTREMELY UNHEALTHY

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b. Issuance with Issuing Agency listed in MND header:

AEUS71 KPBZ 152130
AQIPBZ

Air Quality Forecast
Pennsylvania Department of Environmental Protection
Relayed by National Weather Service Pittsburgh PA
430 PM EST Wed Dec 15 2021

Air quality forecasts for Pennsylvania are provided by the
Pennsylvania Department of Environmental Protection.

PAZ014-020>022-029-073>076-162100-
Allegheny-Butler-Beaver-Armstrong-Washington-Westmoreland-Fayette-
430 PM EST Wed Dec 15 2021

The forecast for Thursday in Pittsburgh is code GREEN, which is
good, and means little or no health risk. The primary pollutant
will be fine particles.

For more information on ground-level ozone and
fine particles, visit <http://www.airnow.gov> and
<https://www.ahs.dep.pa.gov/AQPartnersWeb/>

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c. List of Counties and their AQI values

AEUS72 KRAH 161515
AQIRAH

AIR QUALITY FORECAST
RELAYED BY NATIONAL WEATHER SERVICE RALEIGH NC
1015 AM EST THU DEC 16 2021

Air quality forecasts for most of central North Carolina including the Triangle, Fayetteville and Rocky Mount are provided by the North Carolina Division of Air Quality. Air quality forecasts specifically for the Triad region including Alamance, Davidson, Forsyth, Guilford, and Randolph Counties are provided by the Forsyth County Office of Environmental Assistance and Protection.

AIR QUALITY FORECAST FOR THU DEC 16 2021

Anson County
AQI.....60
COLOR CODE.....YELLOW
PRIMARY POLLUTANT...SMALL PARTICULATE
SIGNIFICANCE.....AIR QUALITY IS A CONCERN FOR PEOPLE WHO ARE UNUSUALLY SENSITIVE TO AIR POLLUTION.

Chatham County
AQI.....55
COLOR CODE.....YELLOW
PRIMARY POLLUTANT...SMALL PARTICULATE
SIGNIFICANCE.....AIR QUALITY IS A CONCERN FOR PEOPLE WHO ARE UNUSUALLY SENSITIVE TO AIR POLLUTION.

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AIR QUALITY INDEX INFORMATION...

COLOR CODE	AIR QUALITY INDEX	DESCRIPTION
GREEN	0-50	GOOD
YELLOW	51-100	MODERATE
ORANGE	101-150	UNHEALTHY FOR SENSITIVE GROUPS
RED	151-200	UNHEALTHY
PURPLE	201-300	VERY UNHEALTHY

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ADDITIONAL INFORMATION...

North Carolina Division of Air Quality website
www.ncair.org
919.707.8400

Forsyth County Office of Environmental Assistance and Protection website
www.forsyth.cc/eap/dailyforecast.aspx
336.727.8060

AirNow website
www.airnow.gov

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2. Air Quality Alert Message (AQA) Examples

a. Counties listed in body of message:

AEUS71 KALY 201416
AQAALY

Air Quality Alert Message
Relayed by National Weather Service ALBANY NY
1016 AM EDT Tue Jul 20 2021

CTZ001-013-210400-
Northern Litchfield-Southern Litchfield-
New Milford, Terryville, and Thomaston
1016 AM EDT Tue Jul 20 2021

...AIR QUALITY ALERT IN EFFECT UNTIL MIDNIGHT EDT TONIGHT...

The Connecticut Department of Energy and Environmental protection
has issued an air quality action day for the following counties...

Northern Litchfield...Southern Litchfield.

An air quality action day means that particulate matter within the
region may approach or exceed unhealthy standards. For additional
information...Please visit the Connecticut Department of
Environmental Protection website at <http://www.ct.gov/deep/AQI>

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NYZ032-033-038>043-047>054-058>061-063>066-082>084-210400-
Northern Herkimer-Hamilton-Southern Herkimer-Southern Fulton-
Montgomery-Northern Saratoga-Northern Warren-Northern Washington-
Schoharie-Western Schenectady-Eastern Schenectady-Southern Saratoga-
Western Albany-Eastern Albany-Western Rensselaer-Eastern Rensselaer-
Western Greene-Eastern Greene-Western Columbia-Eastern Columbia-
Western Ulster-Eastern Ulster-Western Dutchess-Eastern Dutchess-
Northern Fulton-Southeast Warren-Southern Washington-
1016 AM EDT Tue Jul 20 2021

...AIR QUALITY ALERT IN EFFECT UNTIL MIDNIGHT EDT TONIGHT...

The New York State Department of Environmental Conservation has
issued an air quality health advisory for the following counties...

Dutchess...Ulster...Columbia...Greene...Schoharie...Albany...Rensselaer...
Saratoga...Schenectady...Washington...Fulton...Montgomery...Warren...
Hamilton...Northern Herkimer...Southern Herkimer.

Air quality levels in outdoor air are predicted to be greater than an
air quality index value of 100 for fine particles.
The air quality index...or AQI...was created as an easy way to correlate
levels of different pollutants to one scale. The higher the AQI value, the
greater the health concern.

When pollution levels are elevated...the New York State Department of Health recommends that individuals consider limiting strenuous outdoor physical activity to reduce the risk of adverse health effects. People who may be especially sensitive to the effects of elevated levels of pollutants include the very young and those with pre existing respiratory problems such as asthma or heart disease. Those with symptoms should consider consulting their personal physician.

For additional information, please visit the New York State Department of Environmental Conservation website at, <https://on.ny.gov/nyaqi>, or call the Air Quality Hotline at 800-535-1345.

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b. Counties listed in header:

AEAK79 PAFG 141922
AQAAFQ

Air Quality Alert Message
Department of Environmental Conservation
Relayed by National Weather Service Fairbanks AK
1022 AM AKST Tue Dec 14 2021

AKZ222-161700-
Middle Tanana Valley-
1022 AM AKST Tue Dec 14 2021

...AIR QUALITY ALERT IN EFFECT UNTIL 8 AM AKST THURSDAY...

The Department of Environmental Conservation has issued an Air Quality Alert which is in effect until 8 AM AKST Thursday.

North Pole has a Stage 2 alert.

Fairbanks has a Stage 1 alert.

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For additional information about air quality in the Fairbanks North Star Borough please access the web site at <http://dec.alaska.gov/fnsbair> or call 451-2132.

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c. What, Where, When, Impacts bulleted format:

AEUS73 KUNR 141050
AQAUUNR

Air Quality Alert Message
Relayed by National Weather Service Rapid City SD
350 AM MST Tue Dec 14 2021

WYZ054-055-151100-
Northern Campbell-Southern Campbell-
Including the cities of Gillette and Wright
350 AM MST Tue Dec 14 2021

...BLOWING DUST HEALTH ALERT IN EFFECT FOR THE POWDER RIVER BASIN OF

NORTHEASTERN WYOMING IN EFFECT UNTIL 2 PM MST THIS AFTERNOON...

The following message is transmitted in collaboration with the Wyoming Department of Environmental Quality, Air Quality Division.

- * WHAT...Southwest winds 20 to 30 mph with gusts up to 60 mph.
- * WHERE...Powder River Basin of northeastern Wyoming.
- * WHEN...Until 2 PM MST this afternoon.
- * IMPACTS...The strong winds will create blowing dust.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

The Wyoming Air Quality Division recommends the elderly, young children, and individuals with respiratory problems avoid excessive physical exertion and minimize outdoor activities during this time. Although these people are most susceptible to health impacts, the air quality division also advises that everyone should avoid prolonged exposure to the poor air quality conditions.

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3. Air Quality Resources

3.1 Environmental Protection Agency’s Air Quality Index

The Air Quality Index (AQI) is an index for reporting daily air quality. It tells how clean or polluted air is, and what associated health effects might be a concern for the public. The AQI ranges from zero to 500. An AQI value of 100 generally corresponds to the national air quality standard for the pollutant, which is the level EPA has set to protect public health. AQI values below 100 are generally thought of as satisfactory. When AQI values are above 100, air quality is considered to be unhealthy—at first for certain sensitive groups of people, then for everyone as AQI values get higher.

AQI Basics for Ozone and Particle Pollution			
Daily AQI Color	Levels of Concern	Values of Index	Description of Air Quality
Green	Good	0 to 50	Air quality is satisfactory, and air pollution poses little or no risk.
Yellow	Moderate	51 to 100	Air quality is acceptable. However, there may be a risk for some people, particularly those who are unusually sensitive to air pollution.
Orange	Unhealthy for Sensitive Groups	101 to 150	Members of sensitive groups may experience health effects. The general public is less likely to be affected.
Red	Unhealthy	151 to 200	Some members of the general public may experience health effects; members of sensitive groups may experience more serious health effects.
Purple	Very Unhealthy	201 to 300	Health alert: The risk of health effects is increased for everyone.
Maroon	Hazardous	301 and higher	Health warning of emergency conditions: everyone is more likely to be affected.

Figure 3. EPA’s Air Quality Index Colors (Source: <https://www.airnow.gov/aqi/aqi-basics/>)

3.2 Air Quality Guidance Products

NOAA's NWS produces daily air quality forecast guidance which is used by state and local agencies to assist them with issuing their forecasts and alerts, which are also disseminated by the EPA. Four types of guidance are produced: 1-hour and 8-hour average ozone and fine particulate matter (PM_{2.5}) concentrations and their daily maxima from 0 to 72 hours for the Nation, smoke forecast guidance for the Nation and dust forecast guidance for the contiguous United States from 0 to 48 hours. These products are described in detail in NWS Instruction 10-516, [National Non-Precipitation Weather Products Specification](#) at Section 6.

3.3 Useful Air Quality Web Links/Information

The following are a list of useful resources for additional air quality information:

NWS National Air Quality Forecast Capability (NAQFC):
<https://airquality.weather.gov/>

Additional background on NAQFC:
<https://vlab.noaa.gov/web/osti-modeling/air-quality>

EPA's AIRNOW webpage:
<https://airnow.gov/>

Basic Air Quality Training:
[Air Quality Forecasting Fundamentals](#)

Information on Air Stagnation Advisories (NPW Product):
https://www.weather.gov/media/directives/010_pdfs/pd01005015curr.pdf

Note: The NPW Air Stagnation Advisory (AS.Y) product is an advisory issued by NWS WFOs to describe meteorological conditions that yield stagnating air. AQA/AQI products are relayed by the NWS at the request of a local or state air quality agency.