

## CHAPTER 60 - PREDICTIVE SERVICES

Predictive Services provides decision-support to the federal, state and local wildland fire agencies for operational management of and strategic planning for firefighting resources. This is accomplished through the collection, analysis and dissemination of information about fire activity, resource status, weather and fuels, and assessments of fire danger and fire potential. The AICC Predictive Services Section includes personnel from Fire Intelligence and the Fire Weather and Fuels Programs.

### **Intelligence**

The AICC Intelligence section is responsible for gathering and disseminating data regarding wildfire, prescribed fire, and resource commitments on a statewide basis. This is disseminated to local and regional fire managers and, when activated, MAC group members. Data is gathered from 14 local units on a daily basis from mid-April through mid-September.

The Intelligence Staff maintain the Type 2 EFF/AD crew rotation list, post the agency crew status list, produce year end statistics, are the data stewards of the statewide historical fire records, and provide briefings.

AICC Intelligence is notified by the AICC Coordinator when the following situations arise:

- An Incident Management Team is ordered,
- There are a large number of fire starts,
- Politically sensitive incidents occur, or significant major incidents occur,
- If accidents, or entrapments, occur

### **Incident Status Summary (ICS-209)**

ICS-209s are the primary source of Alaska fire activity information for national fire managers. These managers determine the allocation of fire resources on a national basis. The ICS-209s are therefore an essential element in the ability to obtain national resources such as smokejumpers, airtankers, helicopters, and Type 1 crews.

This Incident Status Summary is located on the FAMWEB internet site.

<https://fam.nwcg.gov/fam-web/> A user guide may be found at:

<http://www.predictiveservices.nifc.gov/intelligence/intelligence.htm>; a user may also utilize the hover tips within the 209 program. Refer to the National Interagency Mobilization Guide for additional information.

### **Alaska ICS-209 Requirements for Wildfires**

The ICS-209 is used to report large wildfires or fires that have a significant resource commitment. Large fires are classified as 100 acres or larger in timber fuel types, 300 acres or larger in grass or brush fuel types, or when a Type 1 or 2 Incident Management Team is assigned. A report should be submitted daily until the incident is contained. ICS-209s should be submitted as required by the National Interagency Mobilization Guide, before 2200 AKD.

In addition to the national standard, Alaska requires ICS-209s for all fires (whether in Critical, Full, Modified or Limited) that have a commitment of 17 or more personnel for more than one

burning period (overnight). Zone and Area dispatch offices are responsible for completing the ICS-209s in the event that the Incident Commander fails to submit one.

### **Submitting 209s during a FamWeb Outage**

Complete the digital 209 form and email it to the Geographic Area Coordination Center (GACC) and to the National Interagency Coordination Center (NICC) ([intell@blm.gov](mailto:intell@blm.gov)). If a hard copy 209 form is filled out, fax it to both the Geographic Area Coordination Center and the NICC (NICC faxes: 208-387-5663, or 208-387-5414).

A digital “paper” copy of the current ICS-209 form is available on the NICC Intelligence Website at: <http://www.predictiveservices.nifc.gov/intelligence/intelligence.htm> A copy may also be found in the Appendix. (Incident management teams and dispatch centers should archive a copy of the 209 form in case there is a network outage preventing access to the web.)

Regardless of submission method, it is imperative to call the GACC and NICC (208-387-5093, or 208-387-5400) to let them know that a 209 is being submitted by fax or email. This will help to ensure that the 209 report gets to the Intelligence staff in a timely manner.

### **Alaska Interagency Situation Report**

AICC Intelligence produces a daily situation report from April 1st to September 30th. Statewide incident information for wildland and prescribed fires is assembled from the Zone, Area and Forest night reports. The Alaska Situation Report is posted on the AICC website by 0800 each day.

The AICC Situation Report narrative is the primary source for fire information and should summarize the day’s activities and expected activities for the following day.

Examples of suggested details when formulating an initial narrative are:

1. Who discovered or reported the fire,
2. Time (when the fire was discovered or reported),
3. General location (“approximately 35 miles southwest of Ruby”),
4. Size,
5. Fire Behavior,
6. Fuels and natural barriers,
7. Weather at time of observation,
8. Response and general resources – unit numbers allowed, but no names,
9. If non-standard response – reason for,
10. Current and future tactics,
11. Resources and values at risk,
12. If multiple jurisdictional agencies are involved.

Examples of additional items to consider for updating narratives are:

1. Acreage increases/decreases and collection method,
2. Complexity and is it changing (i.e. Type 3 to Type 2),
3. Estimated contain/control time.

## EXAMPLES

### NEWLY DISCOVERED FIRES:

At 1345 a commercial aircraft pilot reported seeing a new fire located approximately 45 miles southwest of Beaver. The fire was approximately 2-3 acres in size, 85% active and burning in white spruce and tundra. The fire plotted in Critical/Full/Modified suppression management area and it was determined that action needed to be taken. One load of smokejumpers were delivered by smokejumper aircraft J-66 along with zone helitack personnel with helicopter N34954. No additional resources were requested.

The fire plotted in a Modified/Limited suppression management area and was placed in monitor status.

### FIRE LOCATION IN A LIMITED MANAGEMENT AREA:

At 1517 zone detection aircraft N114MN discovered the fire located approximately 45 miles south of the village of Selawik. The fire was approximately 10 acres in size, creeping and smoldering in tundra and black spruce and located in a Limited suppression management area. The fire was placed in monitor status.

### FIRE LOCATED IN A FULL SUPPRESSION MANAGEMENT AREA:

At 1630 smokejumper patrol aircraft Jump-17 discovered the fire located 13 miles east of the village of Ambler. The fire was approximately 15 acres in size, backing and torching in black spruce and located in a Full suppression management area. It was determined that action needed to be taken.

At 1654 eight smokejumpers were delivered by Jump-17. Smokejumpers worked to achieve containment and no further resources were needed.

### FIRE LOCATED IN A CRITICAL SUPPRESSION MANAGEMENT AREA:

At 1212 a private citizen from the village of Nulato reported a wildfire located about ¼ mile from the end of the Nulato airstrip. The fire was approximately 3 to 5 acres in size, running and torching in black spruce and located in a Critical suppression management area. It was determined that action needed to be taken. One load of smokejumpers, 2 CL-215 scoopers and Air Attack resources responded and were able to achieve partial containment of the fire by 2200.

### UPDATES: ON-GOING FIRES WHEN OBSERVATIONS WERE MADE:

-At 1833 the fire was flown by zone surveillance aircraft N9011N. The fire was 30% active, creeping and backing with 3-5 foot flame lengths. The fire size had increased to approximately 550 acres.

-The digitized fire perimeter was updated revealing a new size of 475 acres.

-Observed fire behavior included...  
smoldering in tundra along the northwest perimeter,  
creeping in black spruce within the southeast corner  
single tree torching in black spruce throughout the interior.

-At 1833 the fire was flown by zone surveillance aircraft N9011N. There was no smoke showing and the fire was left in monitor status.

### **Prescribed Fire Reporting**

Prescribed fire information is assembled from the Zone, Area and Forest night reports. These prescribed fires are included in the Alaska Situation Report, as well as the national IMSR. It is the responsibility of the Agency conducting the burning to submit daily prescribed fire reports to their respective local dispatch center, which will forward the information to AICC Intelligence through normal dispatch channels.

### **Incident Management Team Incident Reporting**

When a Type 1 or 2 Team is assigned to an incident within Alaska, the Incident Action Plan should be submitted to the Intelligence Section at AICC on a daily basis.

This information can be faxed to: (907) 356-5678 or emailed to:  
[BLM\\_AK\\_ACCINT\\_dispatch@blm.gov](mailto:BLM_AK_ACCINT_dispatch@blm.gov).

### **National Incident Management Situation Report (IMSR)**

Refer to the *National Interagency Mobilization Guide*.

### **Alaska Type 2 Crew Rotation**

The AICC Intelligence section manages the Alaska Type 2 Crew Rotation list. The rotation list is posted on the AICC website. The list is utilized exclusively for Alaska Type 2 EFF/AD crews, and is updated as crews are assigned to an incident and as they are released.

AICC Intelligence must be notified immediately via TTY of any crew hire, reassignment and release. Crew hire time is the time the crew is asked to assemble to be hired. Release times need to reflect the time the crew is returned to the point of hire (village or home unit): the time that the plane lands or bus arrives. (We want to see times like 1057 and 1113, please do not just round to the nearest hour.) These times may differ from the time listed on their timesheet as more precise times may be needed to differentiate which crew returns first to the rotation list.

When a DOF Area is unable to fill an order with a local Type 2 crew, the dispatch center must place crew orders to AICC via SLC. The order will be filled from the Alaska Type 2 Crew Rotation list.

AFS Zone dispatch centers place crew orders to AICC when they cannot fill an order with their Zone crews, and the order is filled from the rotation list.

Basic guidelines for use of EFF/AD Type 2 crews are as follows:

- Each year the crew list is solidified by June 15th, any crews not made available by this date will be removed.
- AFS Zones and State Areas may use the crews within their Zones or Areas according to Zone or Area policy.

- For other than Initial Attack, orders for crews from outside a Zone or Area will be placed to AICC via established dispatch channels, and AICC will use the Alaska Type 2 Crew Rotation list to fill the requests.
- The crew rotation policy applies to crews that are hired for use as a Type 2 crew on a fire, preposition, support or severity order.
- A partial crew that is hired for Initial Attack, Standby or Camp Crew is not considered to be an EFF Crew.
- The following factors may periodically prevent the normal rotation of crews:
  - availability of transportation
  - poor weather conditions
  - prior notice of crew unavailability
  - village/community obligation to other activities such as fishing, construction, etc.
  - closer proximity of other villages/communities to the fire or staging area during critical fire behavior situations
  - amount of fire activity in the state
  - time restrictions
  - associated costs

If the crew is skipped for one of these reasons, it maintains its place on the rotation list and is considered for the next crew order.

- AICC Intelligence is notified by the Zone or Area dispatch of the date, time, resource order number and request number for all crew hires, reassignments and releases via the TTY.
- A crew is rotated to the bottom of the Alaska Type 2 Crew Rotation list when the crew arrives home from a fire assignment if the crew has been in pay status for three or more shifts. Their position on the list is dependent on the date and arrival time of the crew at their home community. If the crew has not been in pay status for three or more shifts, they retain their original position on the list.
- Crews are rotated regardless of whether they are hired for Zone or Area use, or are hired for use outside of a Zone or Area, if they are assigned to a fire for three or more shifts.
- If there are disputes over whether a crew should be rotated, the Zone/Area Fire Management Officer will make the final decision.

More information about Alaska Type 2 Crew Rotation list crews can be found in Chapter 30 – Crews and the Alaska Emergency Firefighter Type 2 Crew Management Guide, available on the AICC website. <http://fire.ak.blm.gov/logdisp/crews.php>

### **Agency Sponsored Type 1 and Type 2IA Crews**

Incident dispatch organizations, in coordination with incidents, are responsible for timely reporting of the disposition of the resources assigned to the incidents within their area of responsibility.

- Incidents will advise their supporting dispatch organizations regarding any change in the status of their assigned Type 1 and Type 2IA crews. This information is

expected to be relayed from the incident to their responsible dispatch in a timely manner.

## **Weather**

### **Predictive Services Outlooks**

These products are located on the AICC website.

### **7 Day Significant Fire Potential Outlook**

Fire potential is influenced by a combination of fuel dryness, weather, ignition triggers, and resource capability. This product uses each of these individual factors to forecast areas of significant fire potential. Alaska is divided into 21 Predictive Services Areas, or PSAs, each of which defines an area of consistent fire regime based on fire and weather history and administrative boundaries. This product includes narratives on weather, fuels, fire danger and resources.

#### Dryness Levels

WIMS data from designated RAWS stations are combined with weather model data to forecast the dryness levels for a seven day period for each PSA. Dryness levels are based on a national standard:

- Moist: Little or no risk of large fires.
- Dry: Low risk of large fires in the absence of a high-risk event.
- Very Dry: Low/moderate risk of large fires in absence of high-risk event.

#### High-Risk Events

High risk events are identified by a combination of factors which have historically led to a high probability of significantly large and/or active fire occurrence. High risk days can be forecasted by considering fuel dryness, critical weather conditions such as low humidity or wind events, ignition triggers such as lightning and high recreation days, and resource capabilities which may restrict initial attack. All of these elements are considered in the 7 Day Significant Fire Potential product.

This product is produced daily from the beginning of May through mid-August, though exact dates vary depending on fuel conditions, and is posted on both the National Predictive Services website and the AICC website by 11:00am (1100 hrs) each day.

<http://fire.ak.blm.gov/predsvcs/outlooks.php>



### Predictive Service Areas

- AK00 – North Slope
- AK01E - Tanana Valley East
- AK01W – Tanana Valley West
- AK02 - Upper Yukon Valley
- AK03N - Tanana Zone North
- AK03S – Tanana Zone South
- AK04 - Koyukuk/Upper Kobuk
- AK05 - Middle Yukon
- AK06 - Seward Peninsula
- AK07 - Lower Yukon
- AK08 - Yukon-Kuskokwim Delta
- AK09 - Kuskokwim Valley
- AK10 - Bristol Bay
- AK11 - Susitna Valley
- AK12 - Copper River Basin
- AK13 – Matanuska Valley and Anchorage
- AK14 - Kenai Peninsula
- AK15 - Northern Panhandle
- AK16 - Central Panhandle
- AK17 - Southern Panhandle
- AK18 - Kodiak Island

**7 Day Significant Fire Potential Map**

This is a map version of the 7 Day Significant Fire Potential product. It uses color coding to show the forecasted significant fire potential for each PSA over a seven day period.

<http://fire.ak.blm.gov/predsvcs/outlooks.php>

**NIFC Monthly / Seasonal Outlook or National Wildland Fire Potential Outlook**

This national product is issued by the first of each month throughout the year.

<http://www.predictiveservices.nifc.gov/outlooks/outlooks.htm>

Refer to the *National Interagency Mobilization Guide* for details.

**Monthly Outlook for Alaska Fire Season**

This outlook is published by the first of each month, with separate maps for 1 month, 2 month, and 3-4 month. It is included in the NIFC monthly outlook and is posted to the AICC website.

**Spring Outlook for Alaska Fire Season**

This outlook is produced once a year and is posted at the start of May to the AICC website. The Monthly Outlook (discussed above) will provide updates to the seasonal forecast.

**Fuels and Fire Behavior Advisories**

Fuels and Fire Behavior Advisories are issued by Predictive Services when the fuels conditions become exceptionally dry with very dangerous conditions for fire fighters. They are updated every two weeks or as needed.

**Weather Briefings****Statewide Weather Briefing**

Statewide weather briefings are provided seven days a week during the fire season, from the beginning of May through most of August. They are presented at 9:45 am (0945 hrs) in the Alaska Fire Service training rooms. There is a dial-in number available for those who cannot be present at the briefing. A pod cast of the briefing is produced as well, and posted by early afternoon.

The briefing slides are posted to the AICC website. Weather briefings encompass a comprehensive look at today, tomorrow and the next day's weather, with a seven day outlook.

**Operations Weather Briefings**

Weather briefings are also provided to the smokejumpers during much of the fire season, though the frequency of briefings varies depending on the amount of fire activity. During a typical fire season, briefings are provided daily at 10:30 am (1030 hrs) on weekdays, and 11:30 am (1130 hrs) on weekends. Briefings are held at the smokejumper box, and follow the same format as the statewide weather briefings. Requests for briefings are made by the Smokejumper management staff.

**Products Issued by National Weather Service**

All fire weather coordination between the National Weather Service (NWS) and AICC Predictive Services is documented annually in the Alaska Fire Weather Program Annual

Operating Plan for National Weather Service, Alaska Region (NWS) and Alaska Wildland Fire Coordinating Group (AWFCG), which can be found on the Alaska National Weather Service Fire Weather website. [http://firewx.arh.noaa.gov/Fire\\_Wx\\_AOP\\_2016\\_public.pdf](http://firewx.arh.noaa.gov/Fire_Wx_AOP_2016_public.pdf)

All Area/Zone dispatch offices are responsible for notification of their local fire departments, field personnel, and other cooperators regarding any of the advisories listed below.

### Red Flag Warnings and Fire Weather Watches

Red Flag Warnings and Fire Weather Watches are issued by the NWS for weather conditions that may lead to extreme fire behavior on existing fires and/or to numerous fire starts. These are issued when one or more of the following conditions are occurring or expected to occur:

#### General non-convective Red Flag Warning criteria:

Temp $\geq 75^{\circ}\text{F}$	RH $\leq 25\%$	Wind $\geq 15$ mph (sustained)
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#### Exceptions to the non-convective Red Flag Warning criteria:

223-Deltana and Tanana Flats	No temperature criteria	RH $\leq 25\%$	Wind $\geq 30$ mph (sustained)
226-Eastern Alaska Range			
<b>Pre-green*</b> up in zones: 101-Anchorage 111-Matanuska Valley 121-Western Kenai 125-Western PWS	Temp $\geq 65^{\circ}\text{F}$	RH $\leq 25\%$	Wind $\geq 15$ mph (sustained)

\*Green-up will be discussed with local fire managers each spring to ensure an appropriate change date for South Central zones.

#### Lightning criteria:

Forecast LAL $\geq 4$	Very dry fuels using adjective ratings with guidance from Predictive Services
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When a warning or a watch is issued, it will be in the headline of the forecast. The NWS first provides notification to the AICC Predictive Services. The main contact is the AICC Meteorologist (907-356-5691), or the Intelligence Section at AICC, (907-356-5671 or 5674). In turn, Predictive Services will transmit the watch or warning on the TTY to all interested parties, with a follow-up phone call to the affected Areas or Zones. If it is after normal duty hours or when Predictive Services is not available, the AICC Tactical Desk will receive the call, and will therefore disseminate the information over the TTY and by telephone.

A Fire Weather Watch is issued to alert fire personnel to the possible development of a significant fire weather event in the near future, usually for time periods beyond 24 hours. A Red Flag Warning is issued when conditions are occurring or expected to occur within 24 hours. A watch remains in effect until it expires, is canceled or upgraded to a warning. A warning remains in effect until it expires or is cancelled. For any such change, the same notification procedures are used as when a Watch or Warning is issued.

### **Spot Weather Forecasts**

Spot weather forecasts for wildfires, prescribed fires, or any other significant event, are available from the NWS. Requests are made to the appropriate NWS office (ANC, FAI, or JNU) through a national web page and should include the following information: location, aspect, elevation, drainage, fuels, fire name and number, agency, ignition time (for prescribed fires), size, any weather observations from the field, nearby RAWS stations or webcams, and any other information that will aid the forecaster in providing a good spot forecast. Spot requests can be made using one of the following methods:

#### Internet (primary)

On the NWS Spot Forecast web page, complete the information requested on the form. There are required fields as well as space for observations. When the form is completed, submit the request, and call the NWS office to confirm receipt and answer any questions the forecaster may have. This will get you a better product!

#### Paper

If electronic submission of the Spot Forecast Request form is not possible, the information may be faxed to the NWS, with a follow up phone call to confirm receipt and answer any questions the forecaster may have.

#### Other

If internet and fax are not available, a Spot Forecast may be requested via telephone from the NWS office. Be prepared with a list of all the information specified above.

The NWS will be bringing the new Spot Forecast web page online starting June 1, 2016. Training on the new page will be available on the AICC Fire Weather page (<http://fire.ak.blm.gov/predsvcs/weather.php>) as well as links to the new page. As long as the old page is still functional AICC will keep the link to the old site.

In all cases, maintain communication with NWS throughout the process.

Contact information for each of the NWS offices is as follows:

Anchorage:	(907) 266-5167	Fax: (907) 266-5188
Fairbanks:	(907) 458-3705	Fax: (907) 458-3703
Juneau:	(907) 790-6824	Fax: (907) 790-6827

## **Fire Weather Indices**

### **Canadian Forest Fire Danger Rating System Index Charts**

The Alaska interagency fire community utilizes the Canadian Forest Fire Danger Rating System (CFFDRS) for the Alaskan boreal forest in lieu of the National Fire Danger Rating System (NFDRS). CFFDRS tracks the effect of weather on forest fuels, which can then give an estimation of potential fire danger and fire behavior in the area adjacent to the station at which the weather is recorded. It is based on the moisture content of three classes of surface forest fuels, plus the effect of wind on fire behavior. Precipitation is the only input that will add to fuel moisture while temperature, relative humidity, wind speed, and time of year all control the rate of drying.

CFFDRS has fuel models for black spruce with a Fire Weather Index (FWI) component that predicts fuel moisture in duff at various depths. Historically, the long duration problem fires in Alaska have occurred in black spruce stands with a thick moss mat overlying the permafrost.

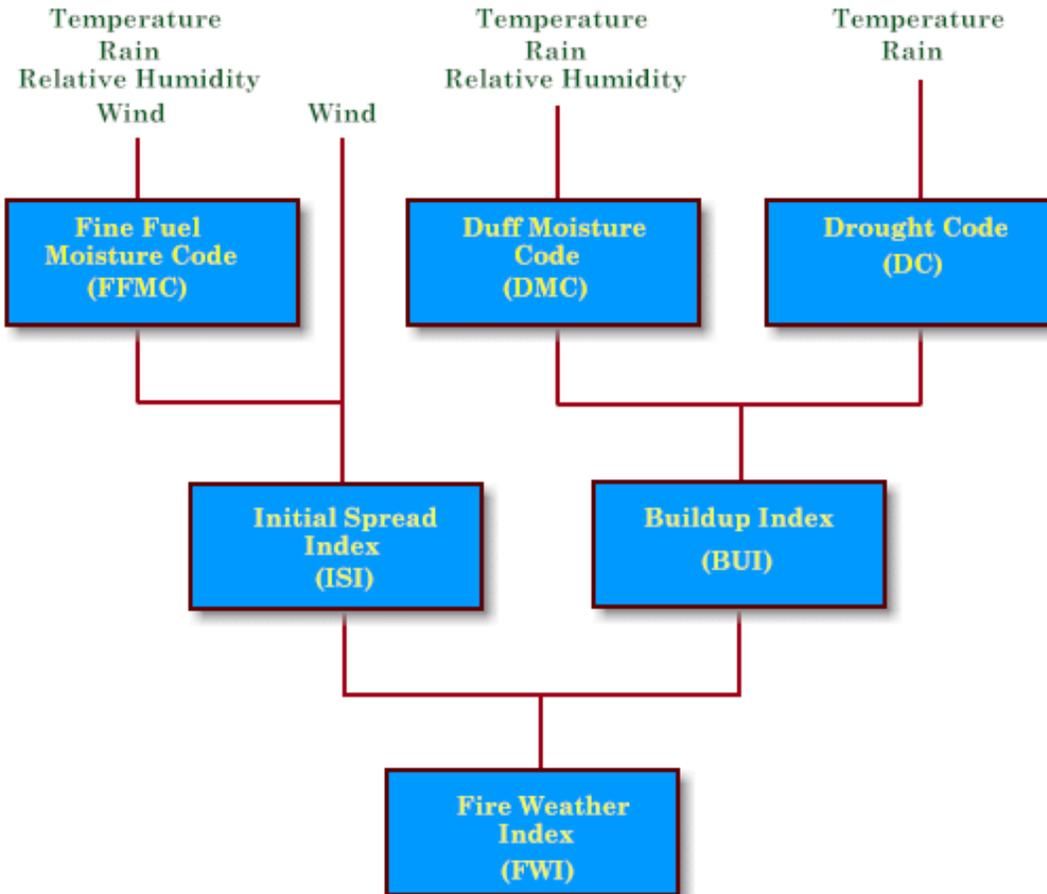
The Fire Weather Index is divided into Fuel Moisture Codes and Fire Behavior Indices.

### **Fuel Moisture Codes**

The three Fuel Moisture Codes are temporal models of the fuel moisture content at three depths in the forest floor. The Fine Fuel Moisture Code (FFMC) represents fine surface litter, and reflects fuel moisture changes over the course of a day. The Duff Moisture Code (DMC) is associated with loosely compacted duff at moderate depths, and gives indications of fuel moisture changes over a couple of weeks. The Drought Code (DC) indicates moisture in deep compact organic matter, and is therefore indicative of long term or seasonal drying trends.

### **Fire Behavior Indices**

The Fuel Moisture Codes are used in combination to form the Fire Behavior Indices. The Initial Spread Index (ISI) combines wind and FFMC to produce a code that indicates rate of fire spread in surface fuels. DMC and DC combine to estimate total fuel available for consumption in the Build Up Index (BUI). The ISI and the BUI combine to give a final Fire Weather Index (FWI) value that represents the fire danger rating (Low, Moderate, High, and Extreme) for a given day. All three Moisture Codes are used in the Fire Behavior Prediction program to forecast quantifiable aspects of fire behavior: rate of fire spread, fuel consumption, crown fraction burned, and fire intensity. See Figure 1 for a breakdown of CFFDRS codes and indices.



**Figure 1 - CFFDRS Components**

Daily CFFDRS data is located on the AK Fire and Fuels website.

<http://afsfire/predsvcs/fuelfire.php>

#### **AK Fire & Fuels Database and Website (MesoWest)**

AICC has contracted with University of Utah MesoWest to maintain the Alaskan FWI database. It is now operational for the 2016 season and is found at <http://mesowest.org/akff/>. It works best in Google Chrome. There are tabular and graphing functions as well as a mapping function which uses gridded forecast data to plot indices for each pixel across the state, as well as for each RAWS station.