Iranian Forest Fire Monitoring system

Iranian Space Agency

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Needs Assessment

Lack of adequate forest resources & terms of forest fire justify presence a forest fire monitoring system

Forest & Range land Fire Condition in Iran

- **Only 8.8% of the country's land area consists of forests divide in two groups:**

  1. ***The northern forests (Caspian Hyrcanian Mixed Forests ecoregion)***
  2. ***Outside of North forests (Zagros Forest Region)***

- **Per Capita forest in Iran is 17.0 Hectares vs World per capita of 62.0 Hectares**

- **52% of the country's land area consists of rangelands containing more than 7000 Plant species.**

Forest and range fire in Iran

- Arson is a very significant cause of forest fires
- October to December is fire season in Caspian Hyrcanian Mixed Forests
- May to September is fire season in Zagros Forest Region

Lack of adequate forest resources & terms of forest fire justify presence a forest fire monitoring system

Objectives

- Production of Daily fire risk map
- Detection and warning of forest fire as soon as possible
- Easy access of Fire danger rate through www protocol

Functional Procedures

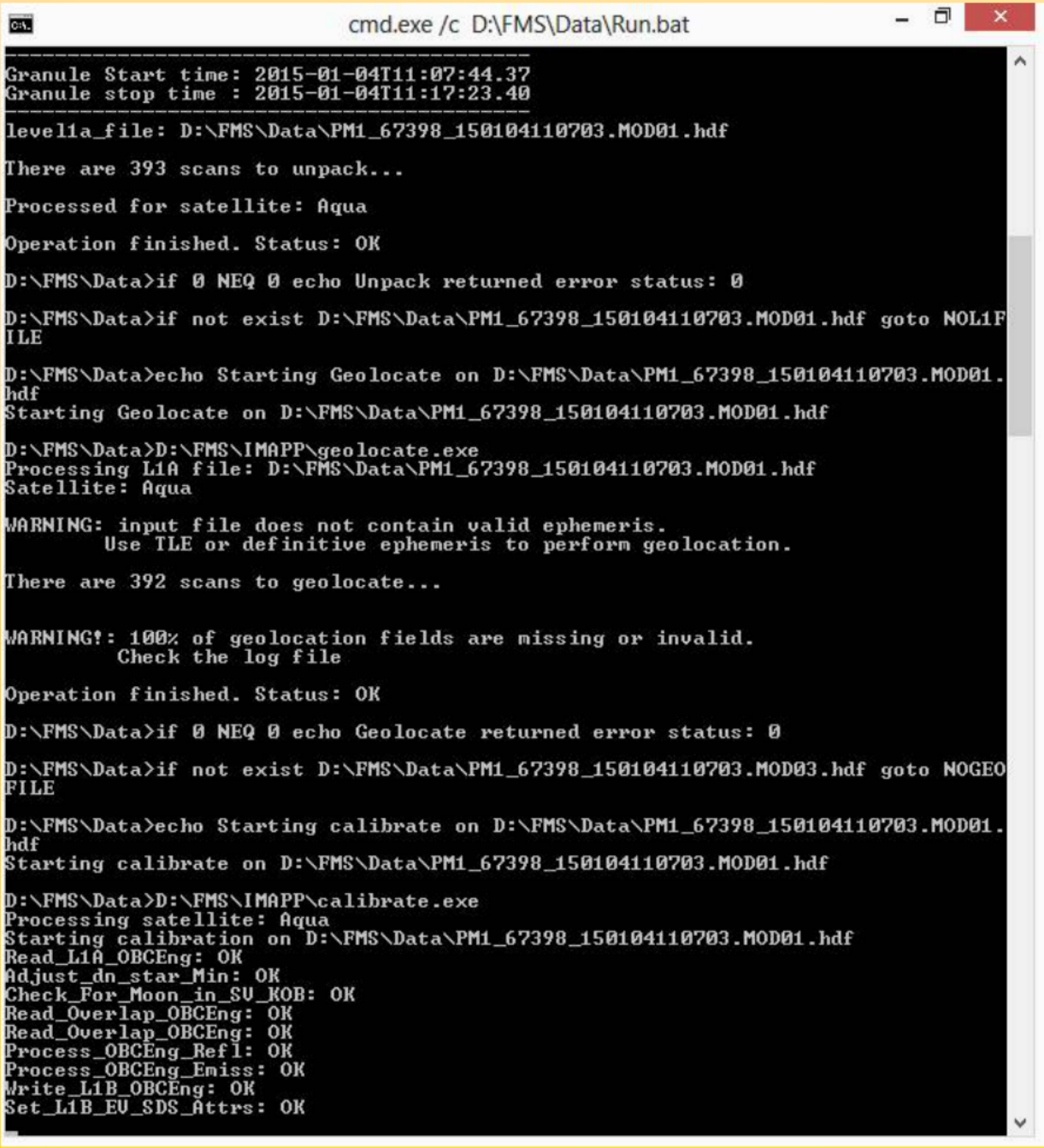
GSM Modem

Receiving Station

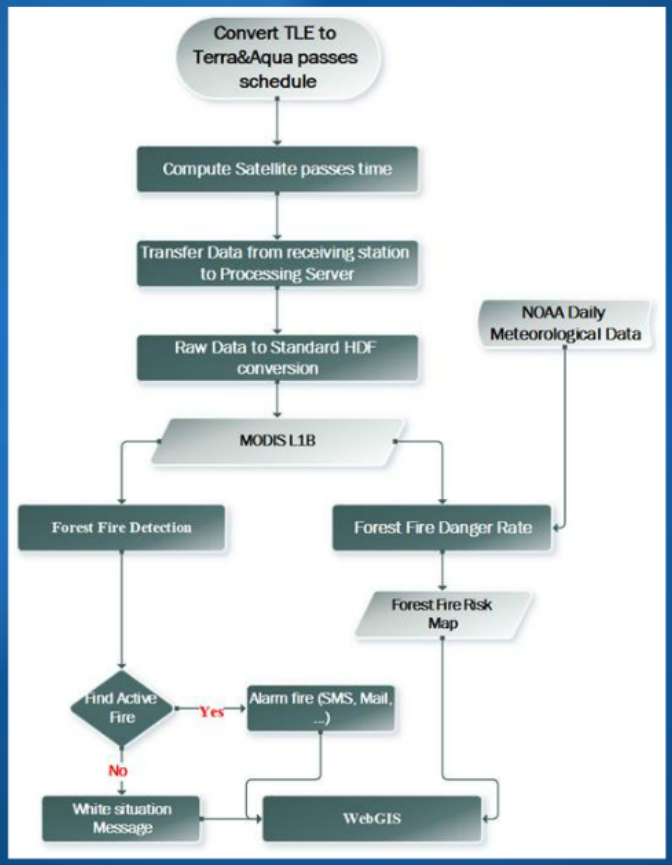
Processing and web GIS Server

Receiving Data from MODIS Satellites by Antenna

Decoding and Processing Raw data



Run Fire Detection algorithms



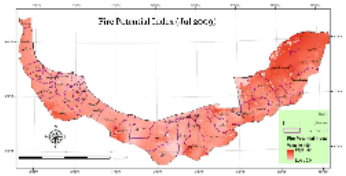
Method in a glance

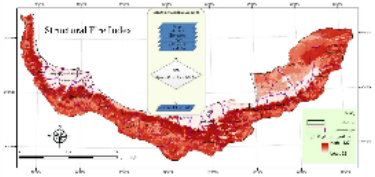
Short-Term or Dynamic Fire Risk Indices

Based on Parameters that change continuously over time

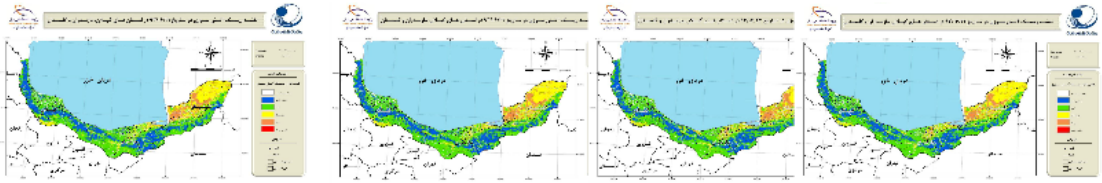
Long-Term Fire Risk Indices

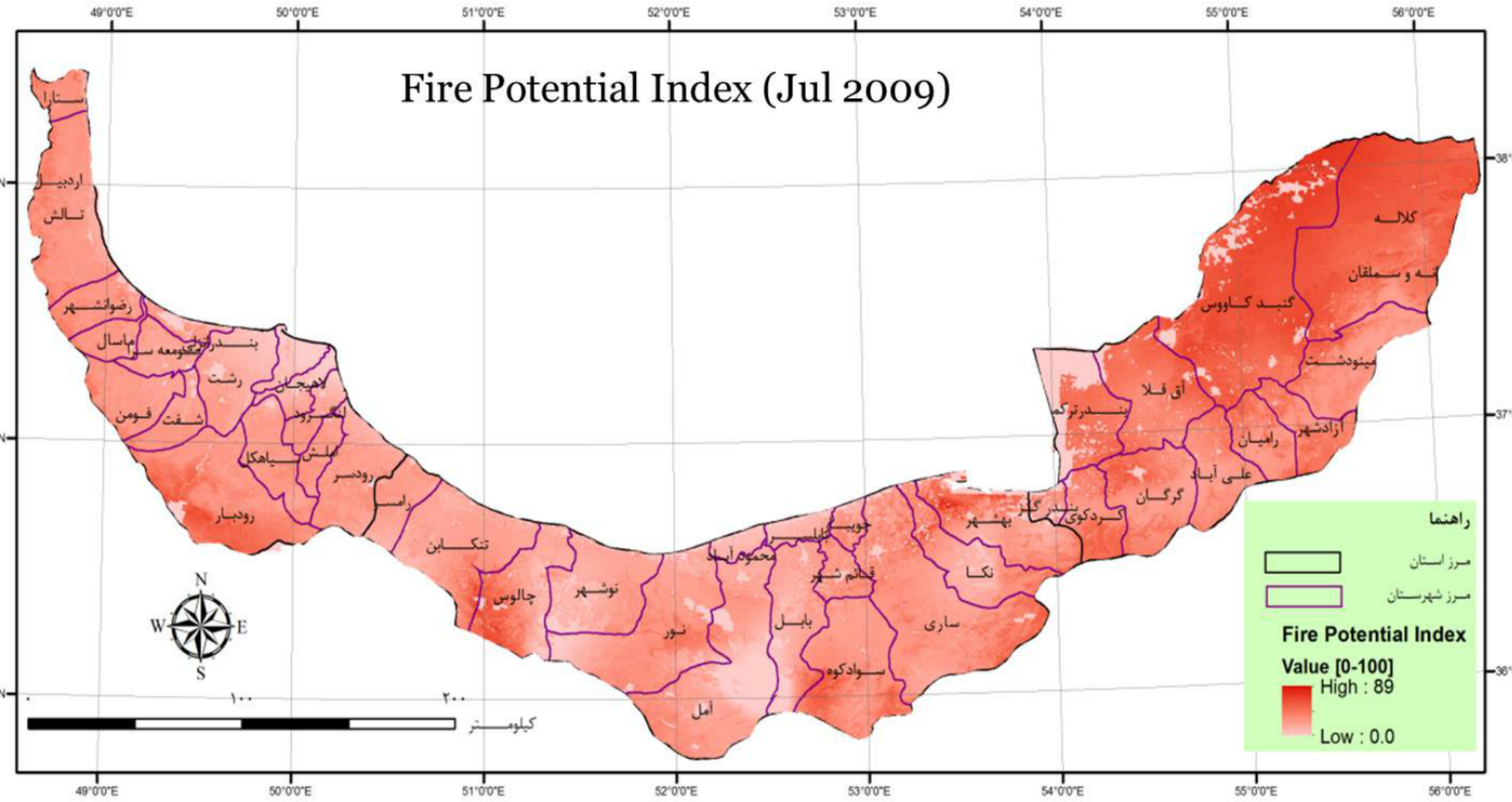
Based on Variables that do not change in short lapse of time

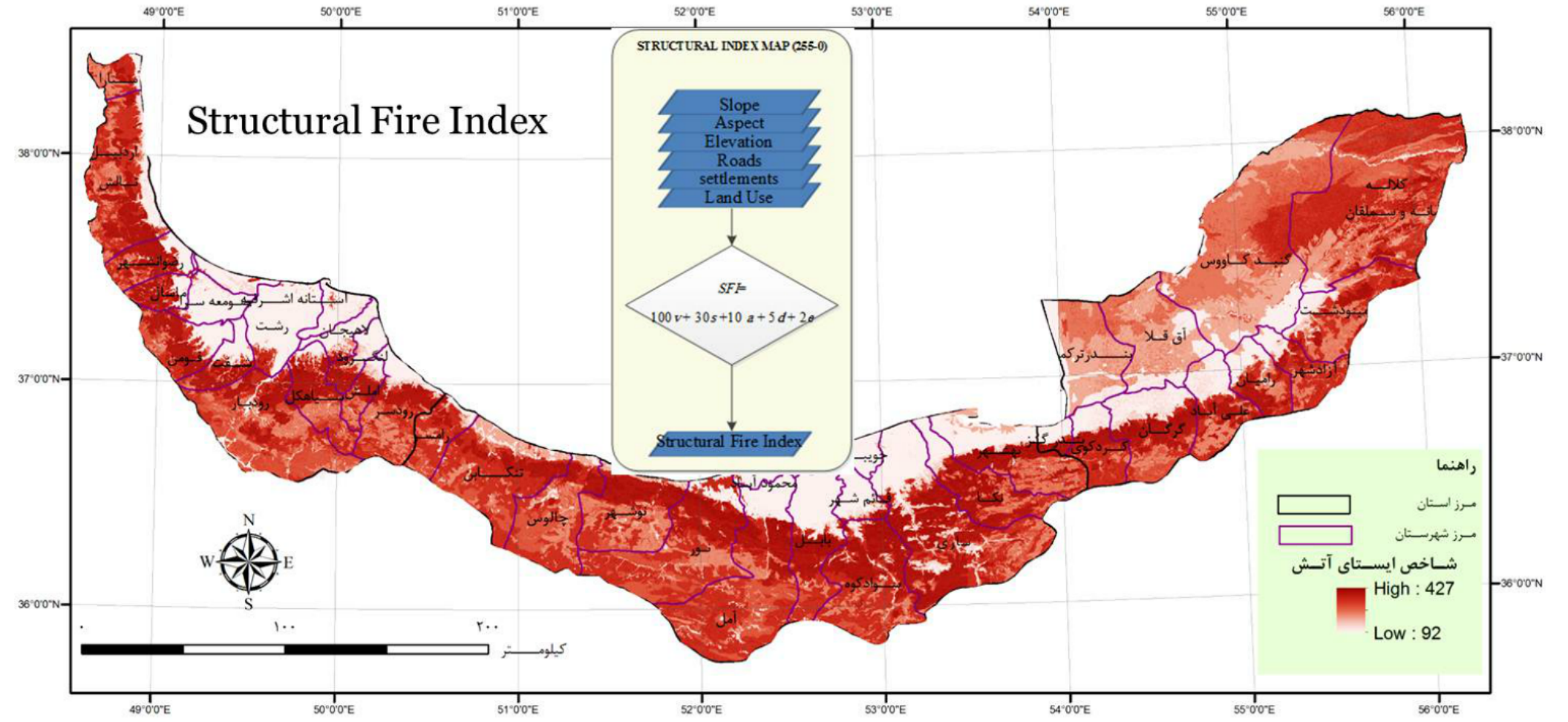


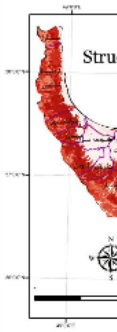


Integrated Fire Risk

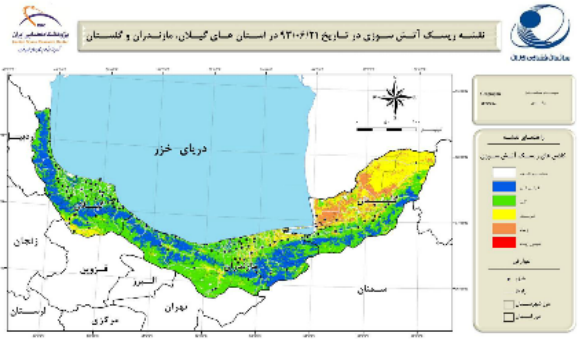


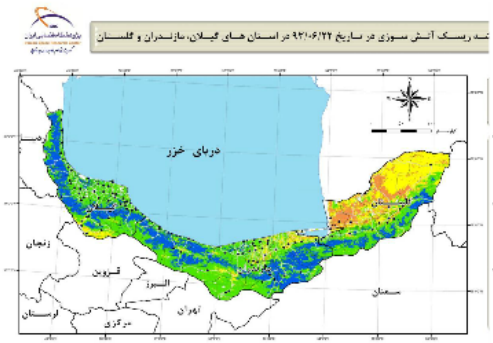

Fire Potential Index (Jul 2009)
49°0'0"E
50°0'0"E
51°0'0"E
52°0'0"E
53°0'0"E
54°0'0"E
55°0'0"E
56°0'0"E
ستارا
اردبیل
تالش
رضوانشهر
ماسال
بندرانزلی
حکومعه سرا
رشت
لاهیجان
لنگرود
شفت
فومن
املش
سیاهکل
رودسر
رودبار
رامسر
تنکابن
چالوس
نوشهر
نور
محمودآباد
قایمشهر
بابل
آمل
سوادکوه
ساری
نکا
بهشهر
کردکوی
بندرگز
گرگان
علی آباد
آق قلا
بندرترکمن
گنبد کاووس
رامیان
مینودشت
ازادشهر
کلاله
ته و سملقان
N
W
E
S
۰
۱۰۰
۲۰۰
کیلومتر
راهنما
مرز استان
مرز شهرستان
Fire Potential Index
Value [0-100]
High : 89
Low : 0.0

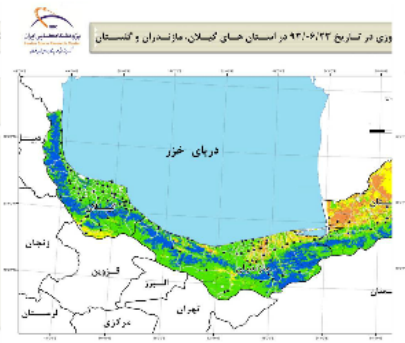

Structural Fire Index
STRUCTURAL INDEX MAP (255-0)
Slope
Aspect
Elevation
Roads
settlements
Land Use
SFI=
100 v+ 30 s+10 a+5 d+ 2 e
Structural Fire Index
راهنما
مرز استان
مرز شهرستان
شاخص ایستای آتش
High : 427
Low : 92
N
W
E
S
۰
۱۰۰
۲۰۰
کیلومتر
49°0'0"E
50°0'0"E
51°0'0"E
52°0'0"E
53°0'0"E
54°0'0"E
55°0'0"E
56°0'0"E
38°0'0"N
37°0'0"N
36°0'0"N
رشت
لاهیجان
لنگرود
رودسر
تنکابن
چالوس
نوشهر
نور
بابلسل
آمل
محمودآباد
قائم شهر
بهشهر
گرگان
گنبد کاووس
آق قلا
بندرترکمن
علی آباد
کردکوی
بندرگز
رامیان
ازادشهر
مینودشت
کلاله
مینو دشت

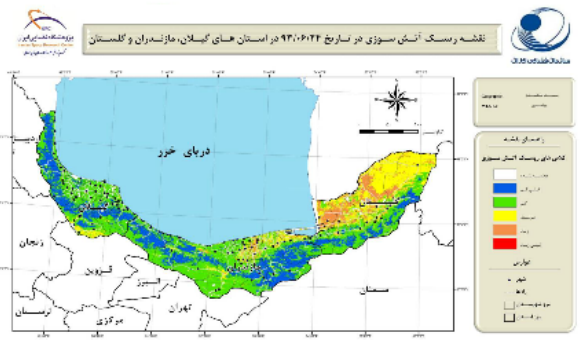


Integrated Fire Risk

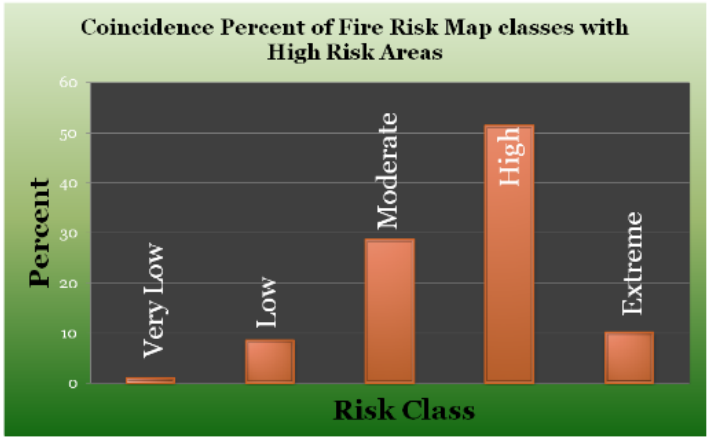


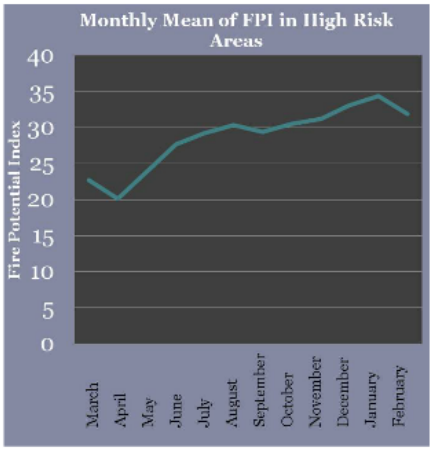


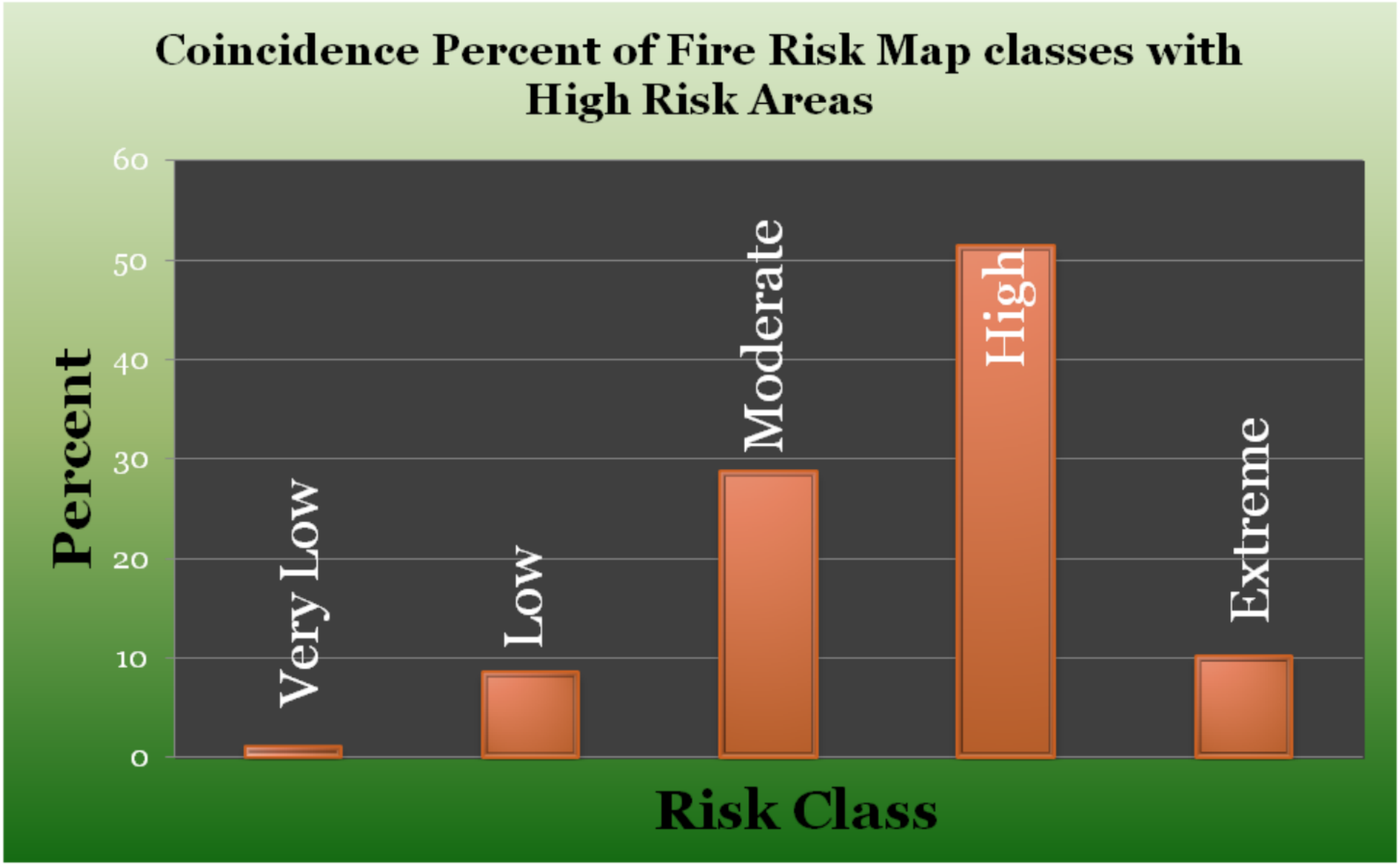




Accuracy Assessment





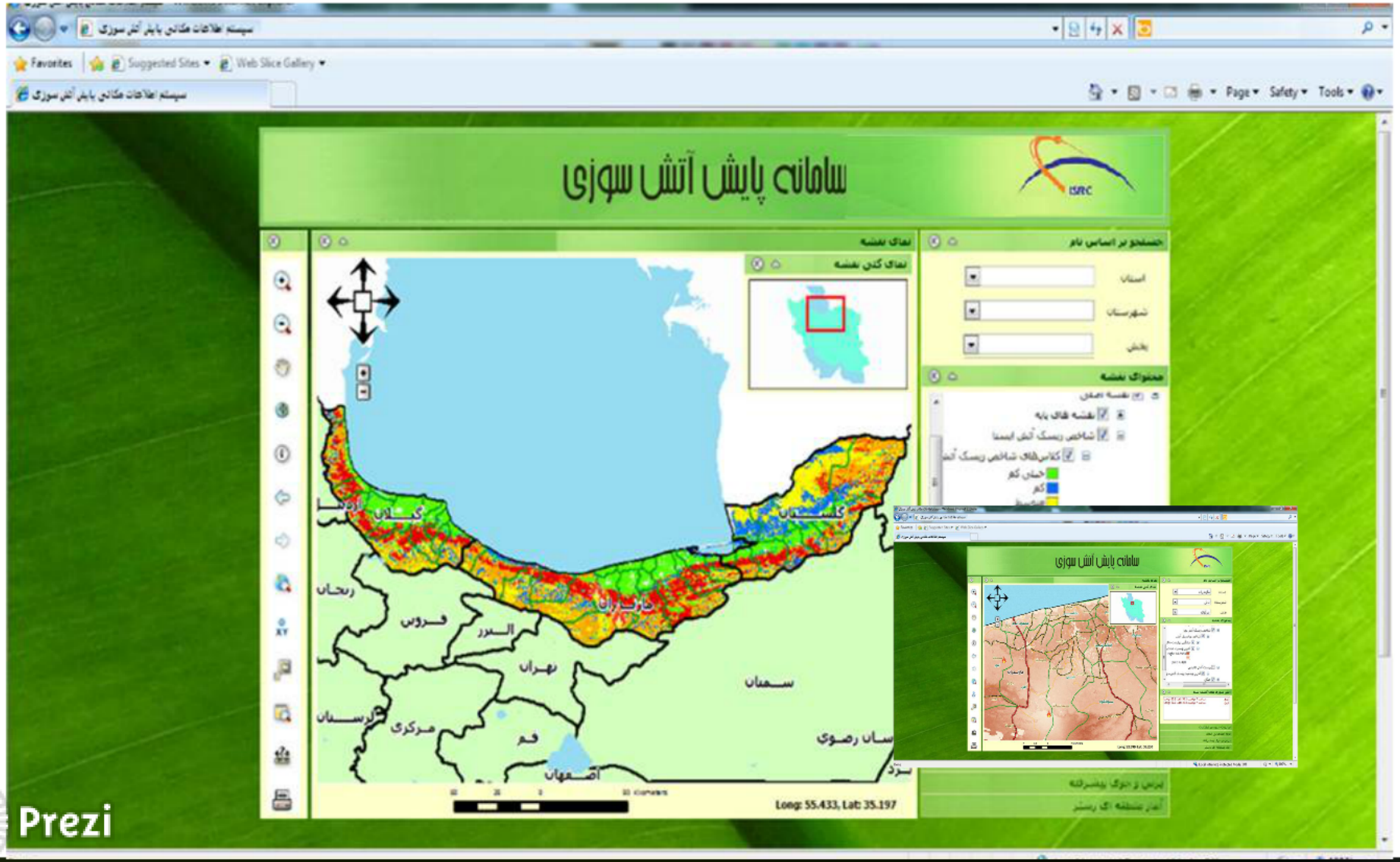

Coincidence Percent of Fire Risk Map classes with High Risk Areas
Percent
60
50
40
30
20
10
0
Very Low
Low
Moderate
High
Extreme
Risk Class

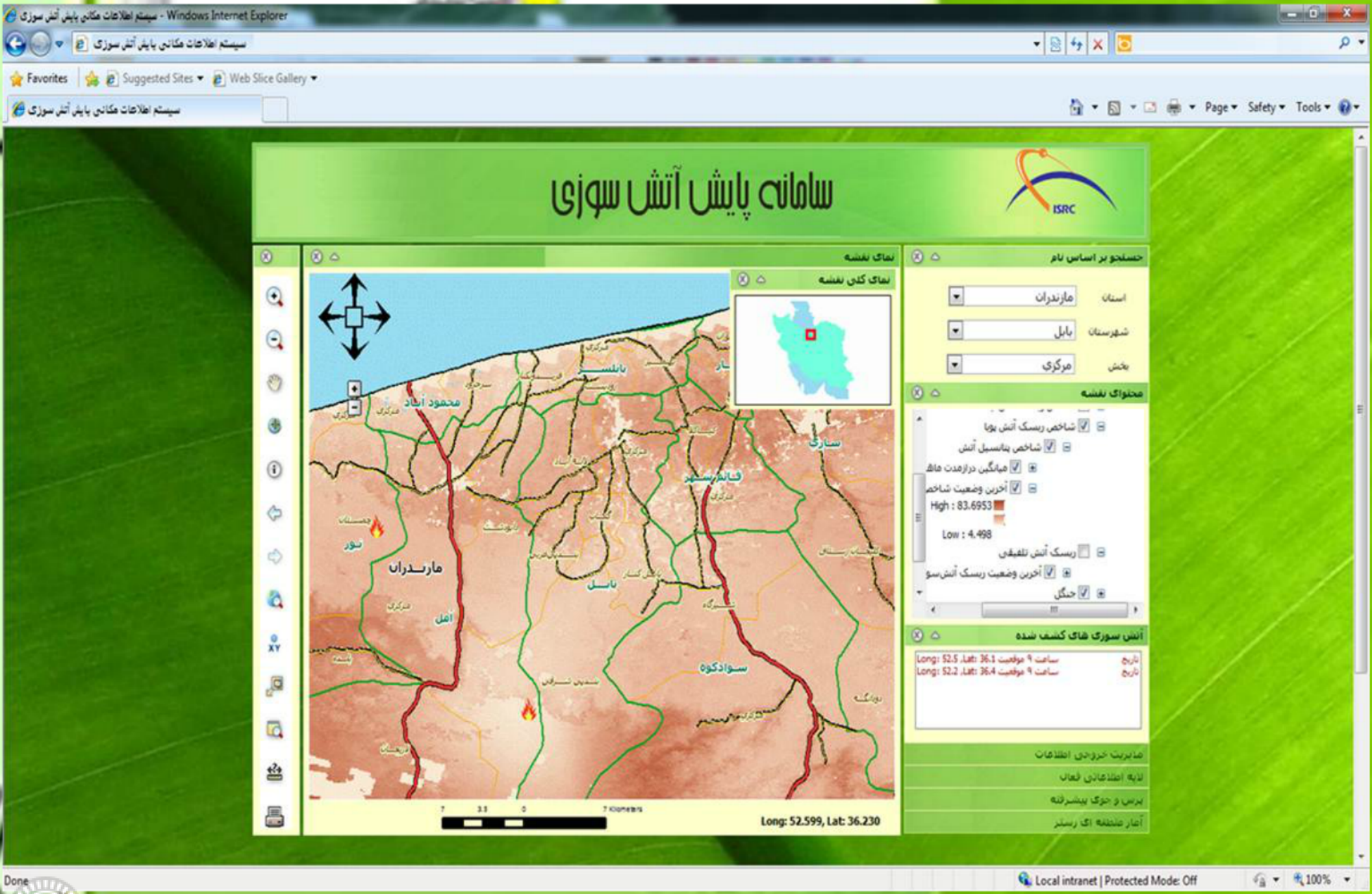
Monthly Mean of FPI in High Risk Areas
Fire Potential Index
40
35
30
25
20
15
10
5
0
March
April
May
June
July
August
September
October
November
December
January
February

Fire Risk Assessment Map: Web GIS

Capabilities

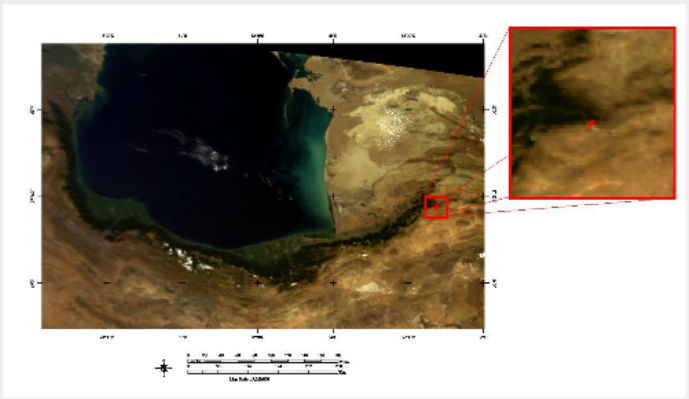
- Automated production and updating of fire risk maps & warning maps
- Standard spatial WebGIS tools(Zooming, Padding, Query, ..)



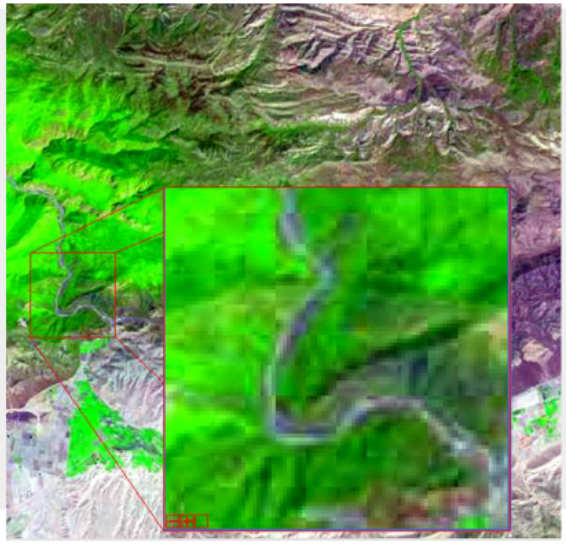

سیستم اطلاعات مکانی پایش آتش سوزی - Windows Internet Explorer
Favorites
Suggested Sites
Web Slice Gallery
Page
Safety
Tools
سامانه پایش آتش سوزی
ISRC
نمای نقشه
نمای کلی نقشه
جستجو بر اساس نام
استان
مازندران
شهرستان
بابل
بخش
مرکزی
محتوای نقشه
شاخص ریسک آتش پویا
شاخص پتانسیل آتش
میانگین درازمدت هاله
آخرین وضعیت شاخص
High : 83.6953
Low : 4.498
ریسک آتش تلفیقی
آخرین وضعیت ریسک آتش‌سو
جنگل
آتش سوزی های کشف شده
Long: 52.5 ,Lat: 36.1 ساعت ۹ موقعیت
Long: 52.2 ,Lat: 36.4 ساعت ۹ موقعیت
مدیریت خروجی اطلاعات
لایه اطلاعاتی فعال
پرس و جوی پیشرفته
آمار منطقه ای رستر
محمود آباد
نوشهر
چمستان
نور
مازندران
آمل
بابل
قائم‌شهر
ساری
سوادکوه
Long: 52.599, Lat: 36.230
Done
Local intranet | Protected Mode: Off
100%
Prezi

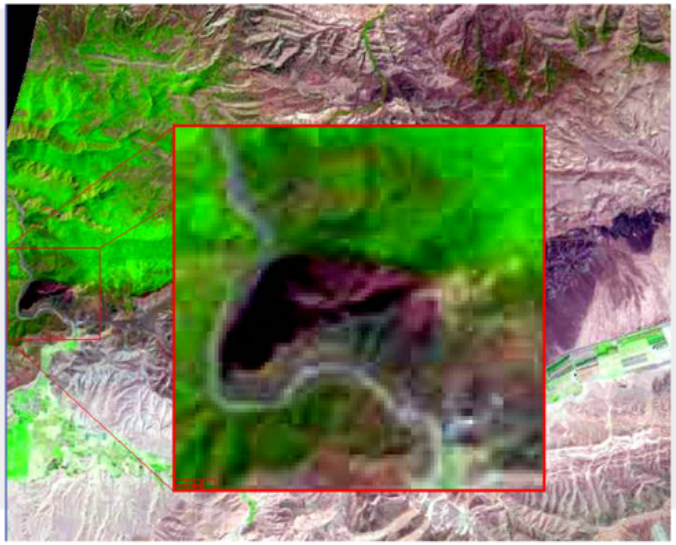
Application of IFFMS in deforestation

Golestan Fire 07July 2014 - is detected 3 hours before official report



The actual fire size is estimated 53.40 hectares.





Final Note

Iranian Space Agency have the potential of any international cooperation in the following items:

- Design, implementation and development of Fire Monitoring System
- Conducting Training Courses
- Land cover/ Land use studies using RS&GIS technologies

Thanks!