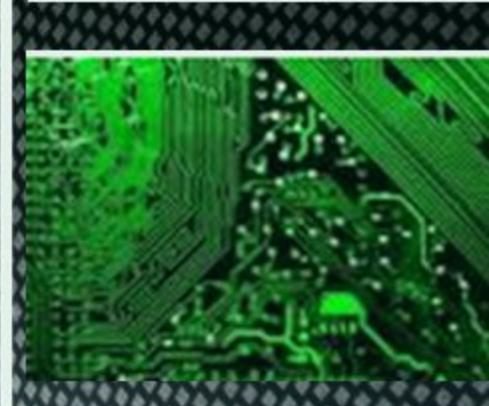
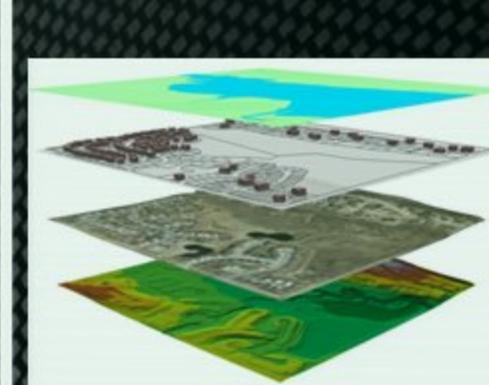
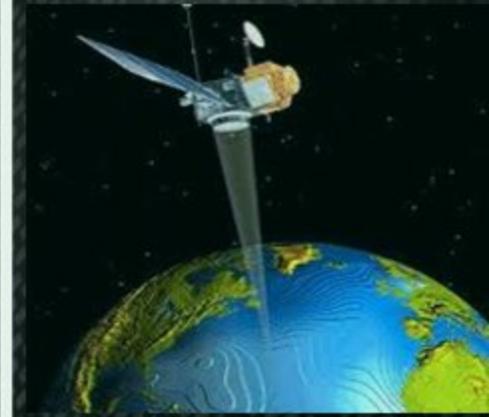


# Training in the latest developments in remote sensing, geographic information systems, information management, and communications technologies

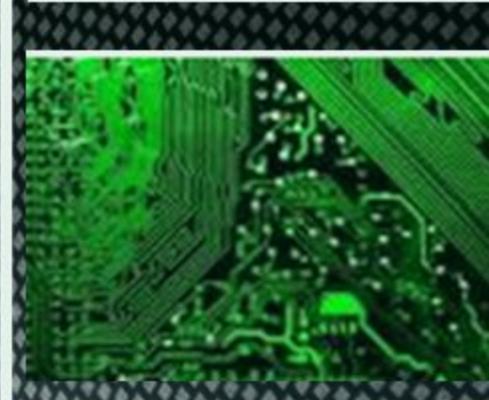
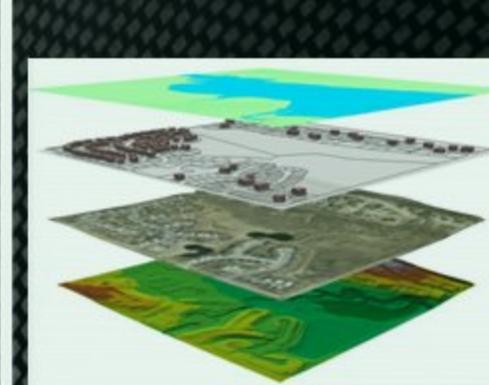
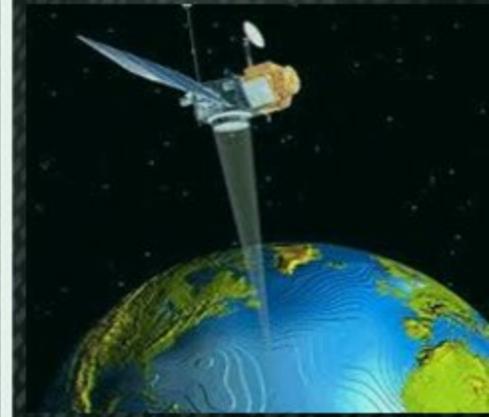
Laurie Kurth, Fire Ecologist, USDA Forest Service

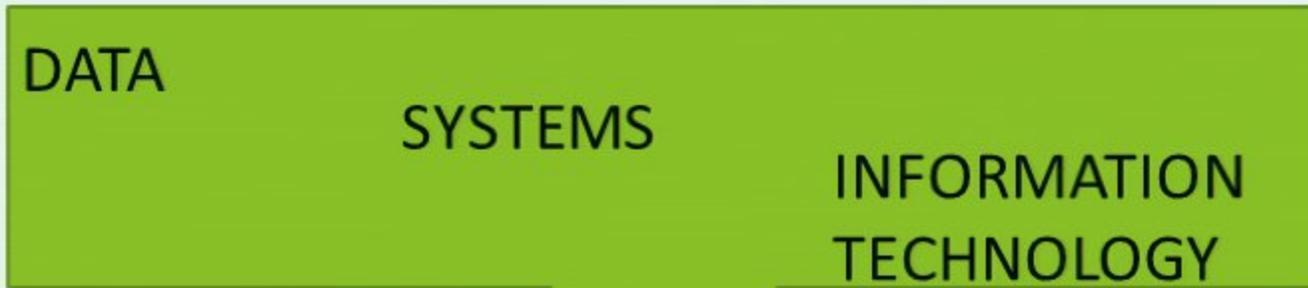
Deb Fleming, NWCG Training Branch Manager

Jeff Jones, Ecologist, USDA Forest Service

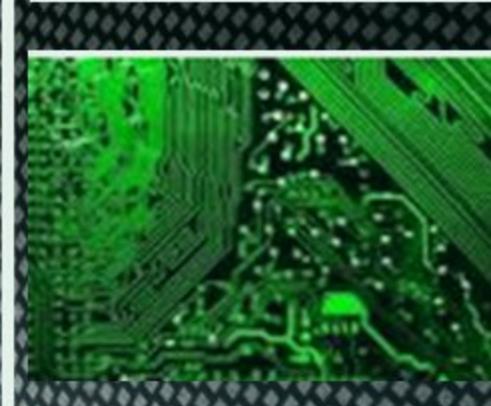
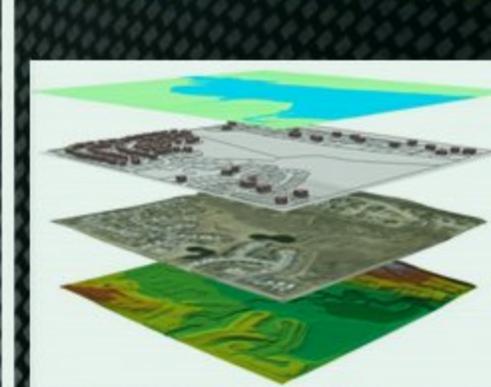
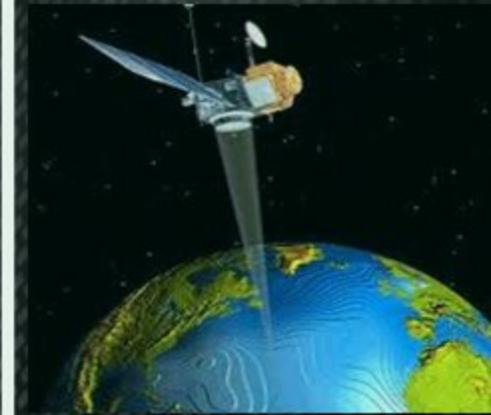


*Recommendation 7: There should be a new emphasis on training that incorporates the latest developments in remote sensing, geographic information systems, information management, and communications technologies*



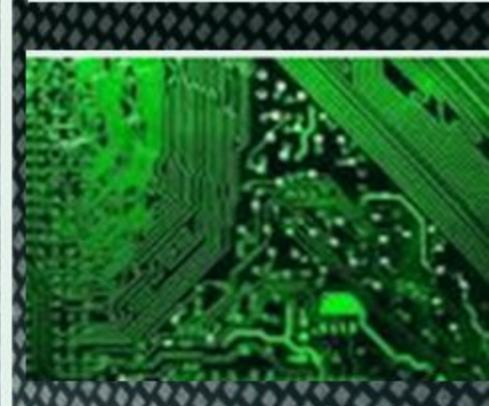
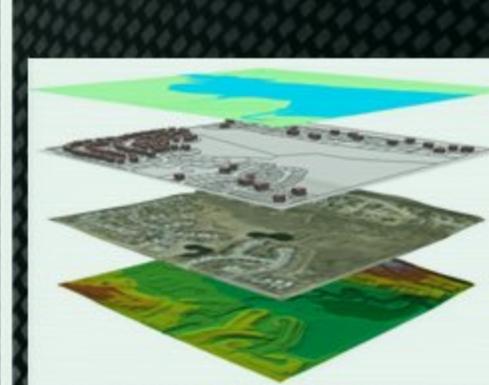
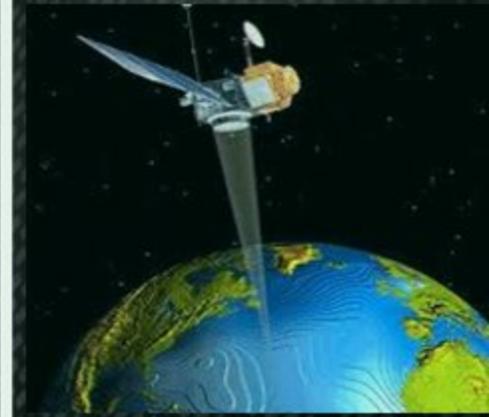


TRAINING

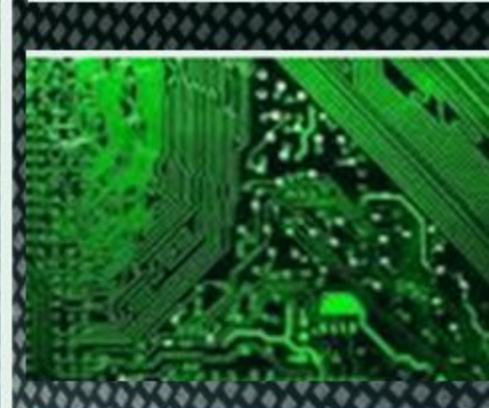
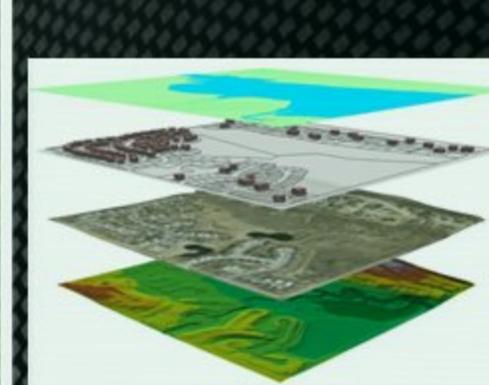
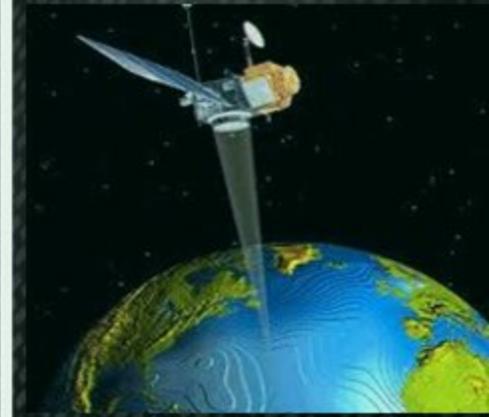


# PURPOSE

- *Review the data, systems, information technology and training available in 2000*
- *List the advances in data, systems, and information technology since 2000*
- *Identify the methods and organizations now delivering training*
- *Discuss future opportunities and challenges*



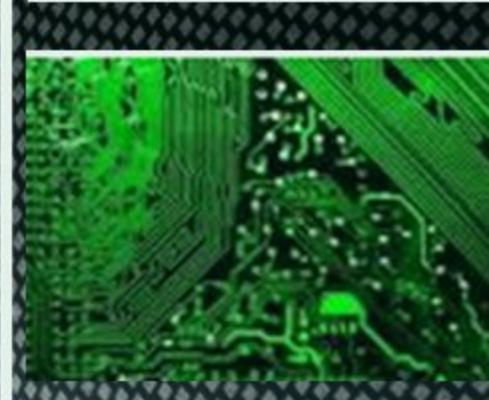
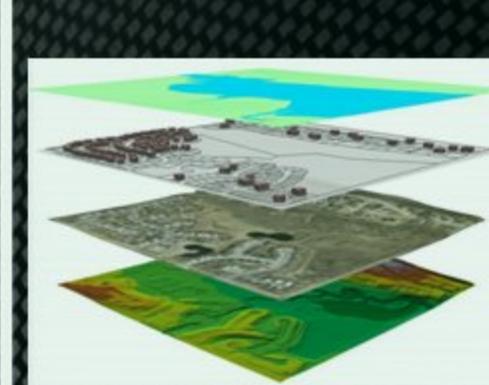
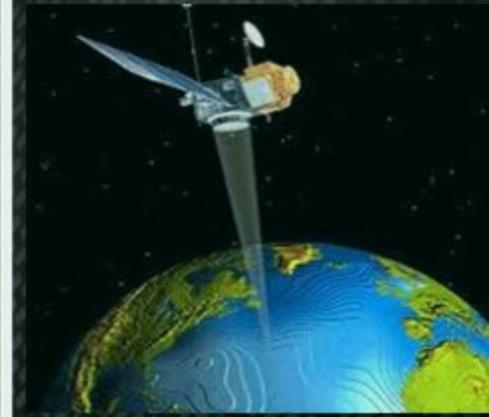
# Where We Were in 2000



# Where we were

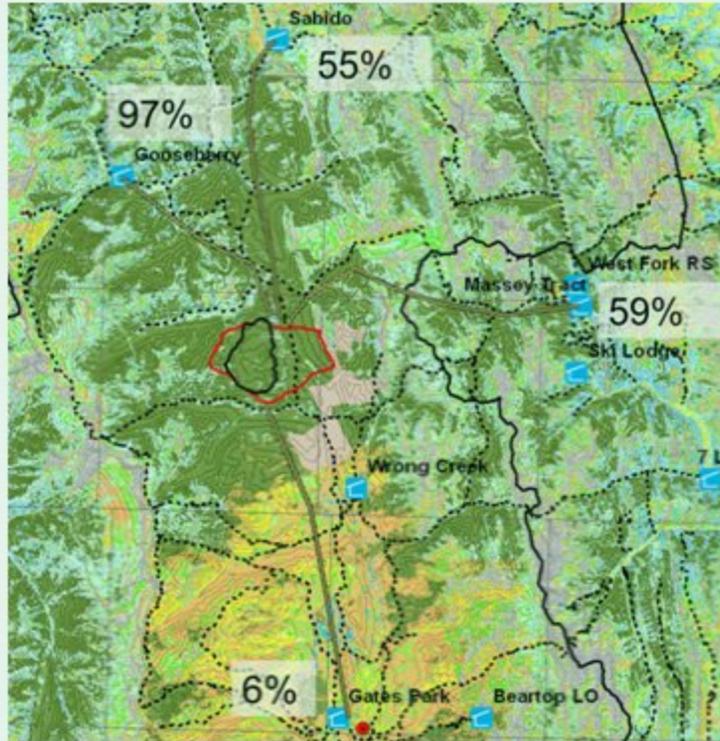
## DATA

- Geospatial data available at some local units, areas or regions
- GIS programs in many land management units – managed and used by GIS specialists, primarily map production, limited analysis



# Where we were

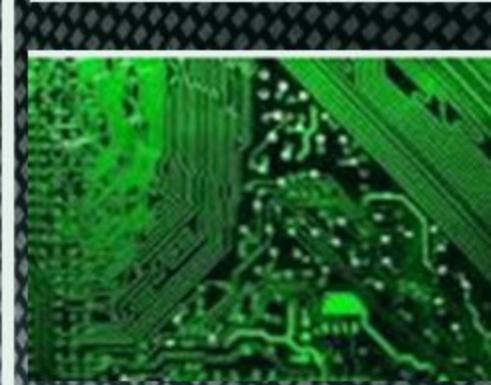
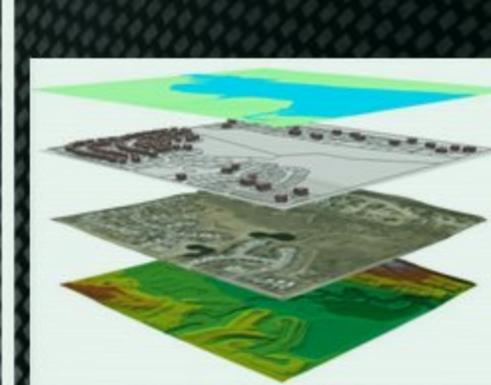
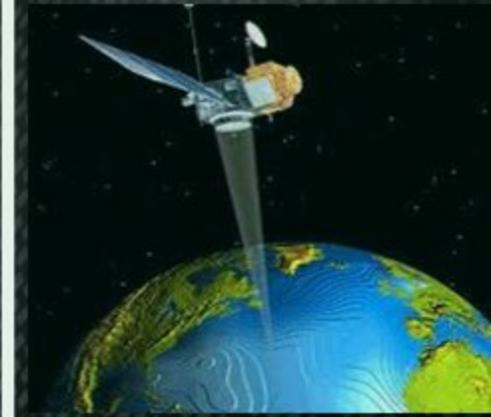
## SYSTEMS



RERAP  
Season  
Probability

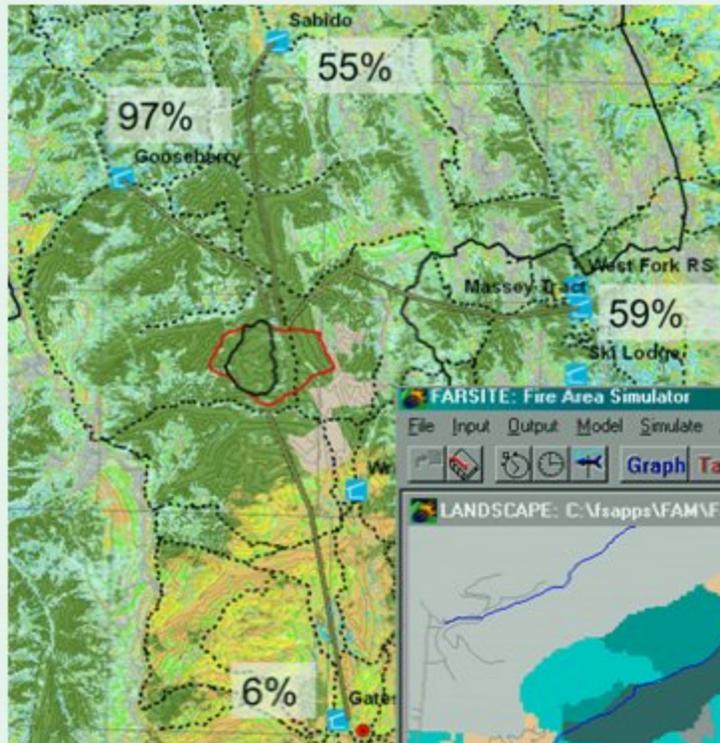
West Fork  
Gooseberry  
Sabido  
Gates Park

(Wrong Creek already  
prepared)



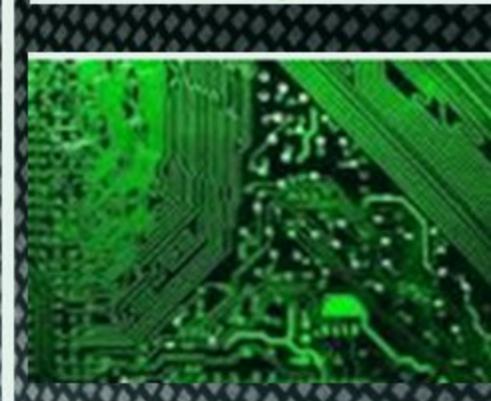
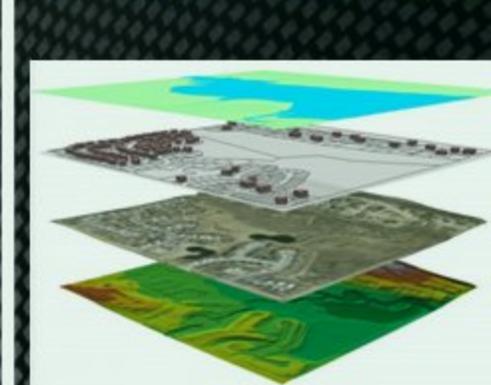
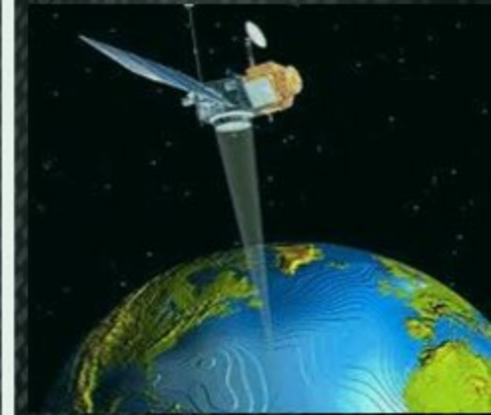
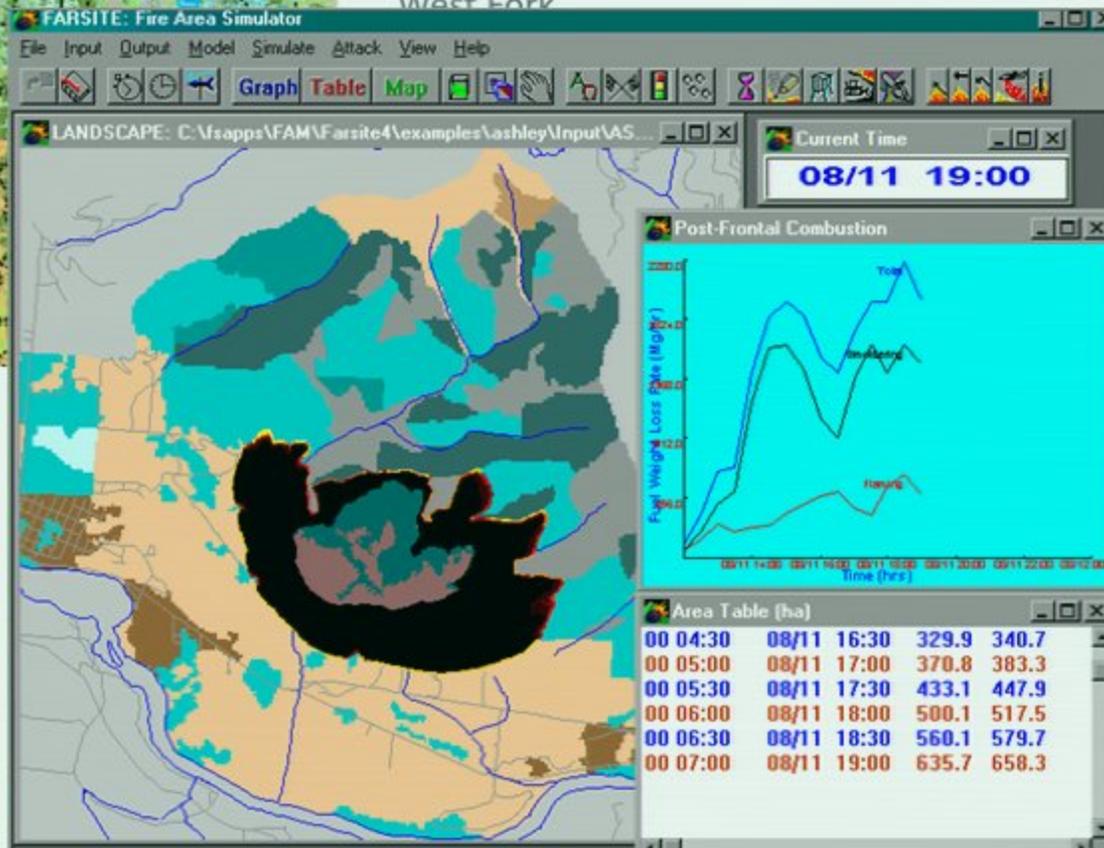
# Where we were

## SYSTEMS



RERAP  
Season  
Probability

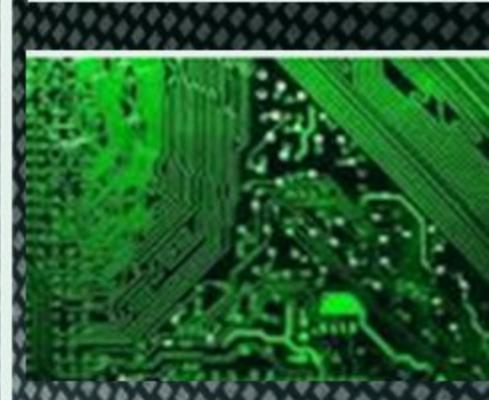
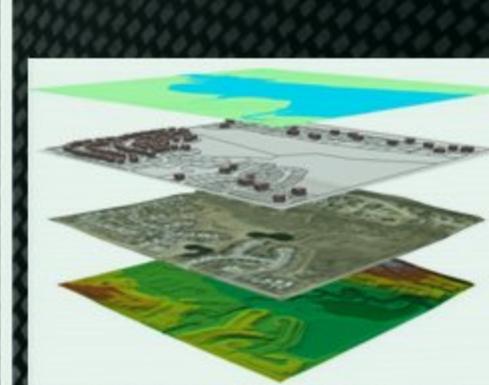
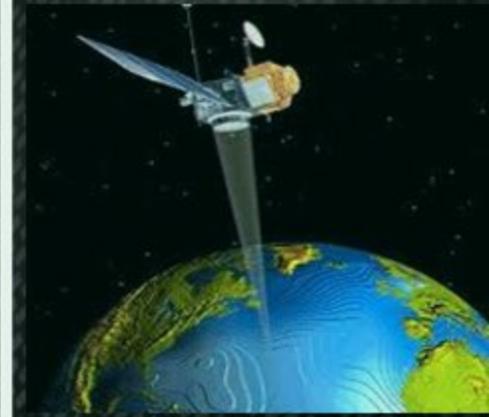
West Fork



# Where we were

## INFORMATION TECHNOLOGY

- Some wildland fire information and data available through the world wide web



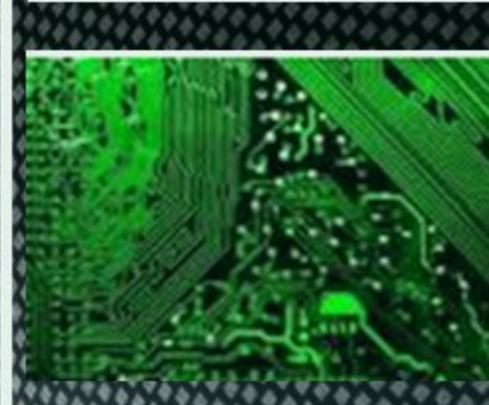
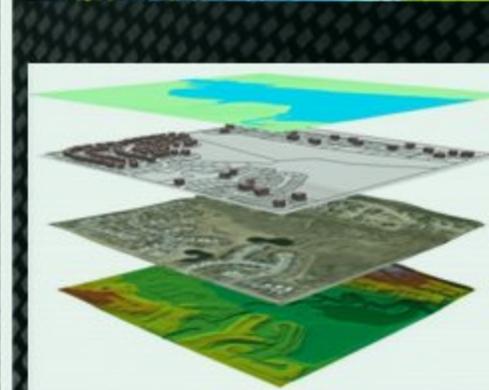
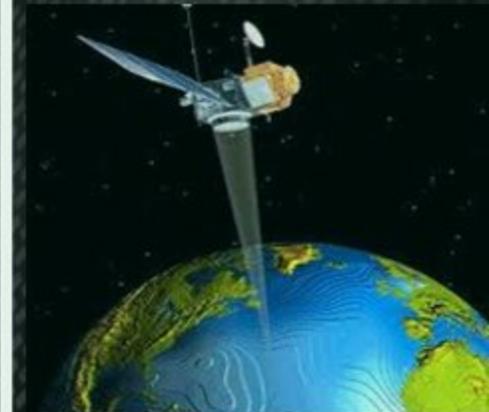
# Where we were

## INFORMATION TECHNOLOGY

- Some wildland fire information and data available through the world wide web

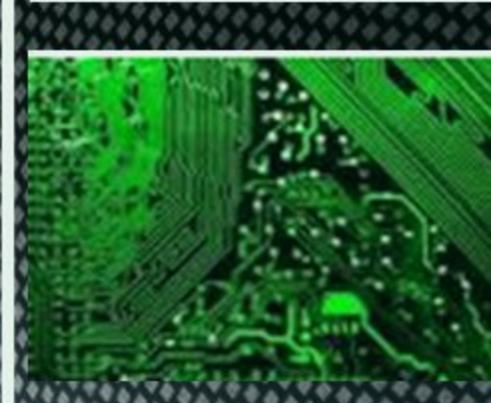
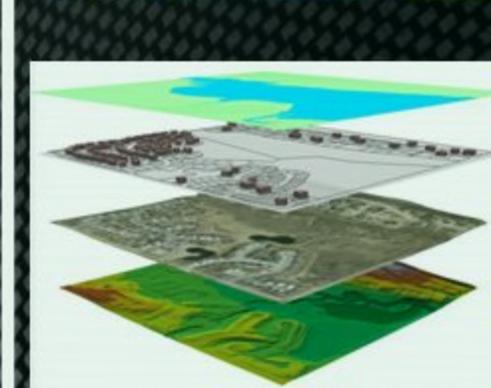
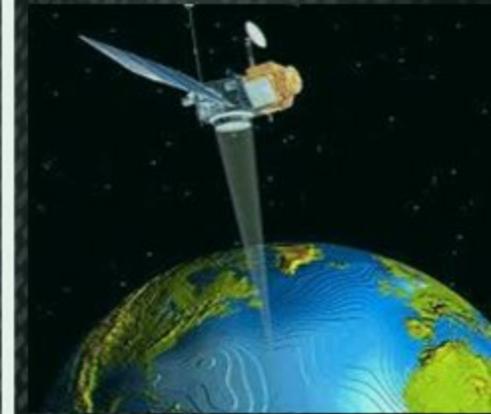
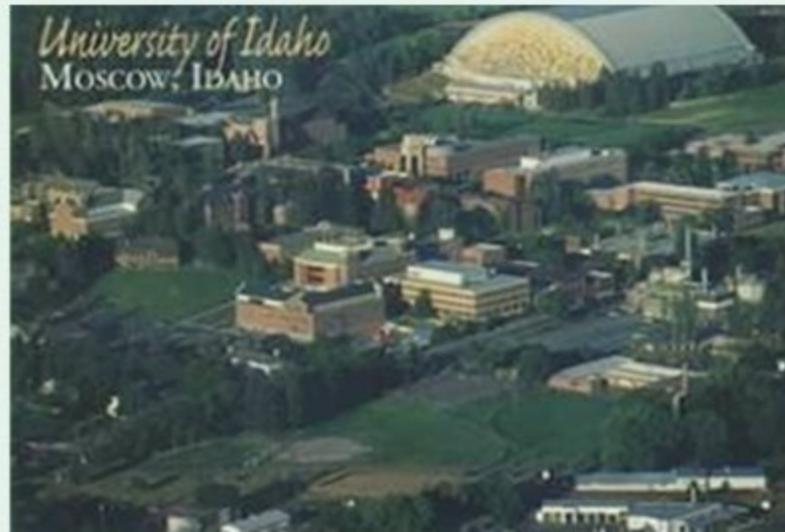


- Internet is available at most agency offices and at some incident command posts



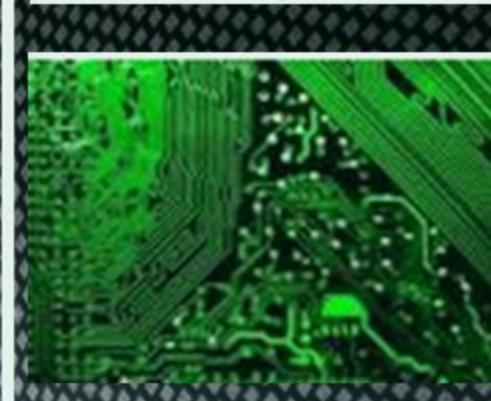
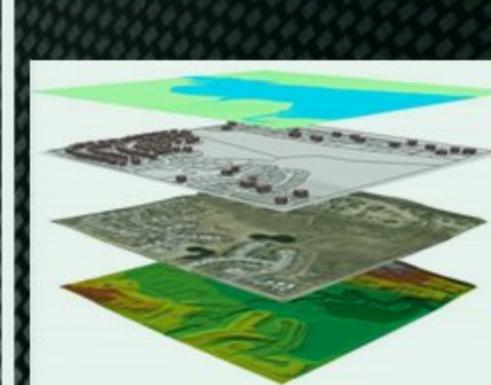
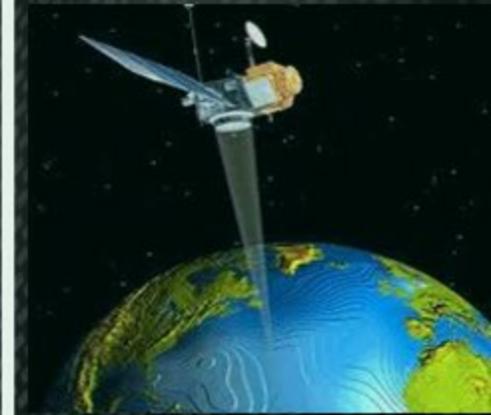
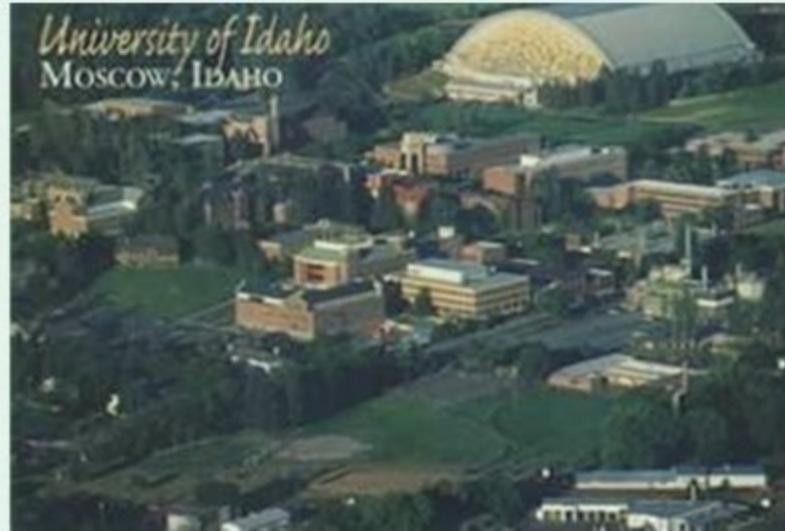
# Where we were

## TRAINING

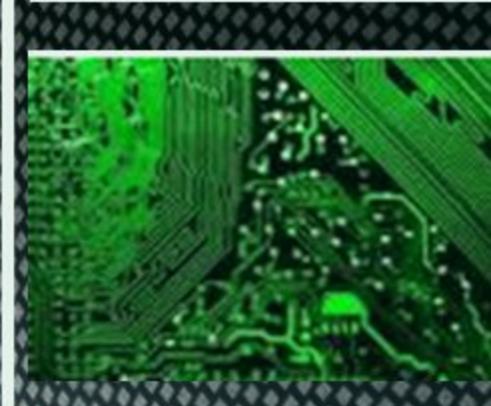
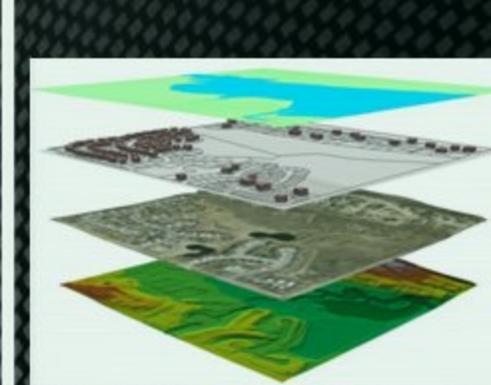
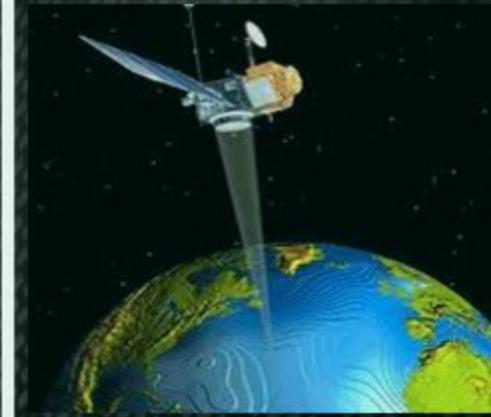


# Where we were

## TRAINING



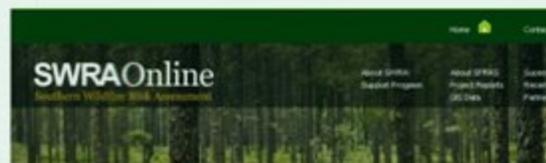
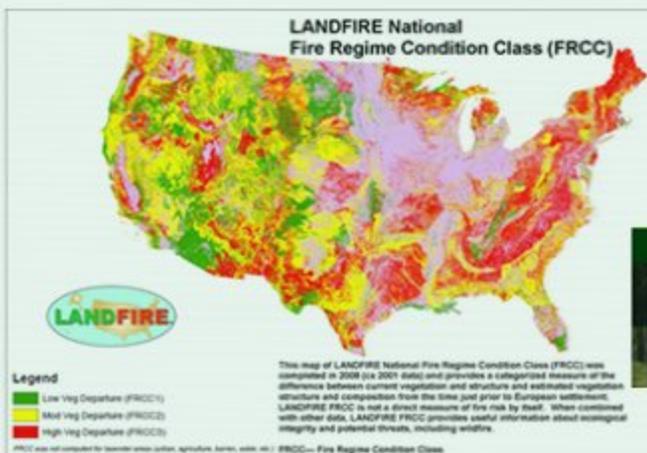
# Advances since 2000



# Advances Since 2000

## DATA

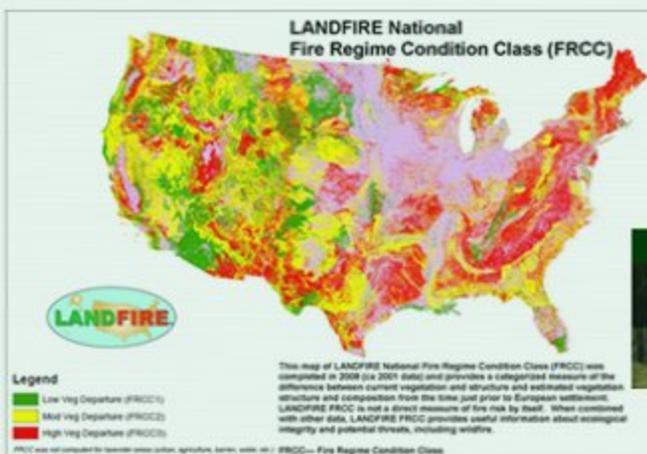
- LANDFIRE provides national geospatial data coverage for the US



# Advances Since 2000

## DATA

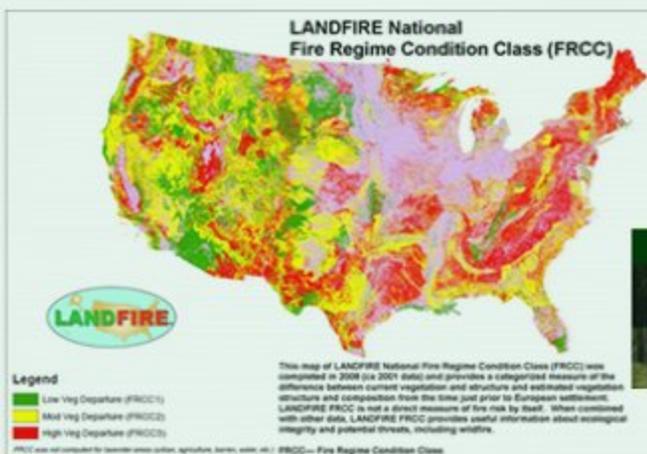
- LANDFIRE provides national geospatial data coverage for the US
- Southern Wildfire Risk Assessment provides geospatial data for the southern US



# Advances Since 2000

## DATA

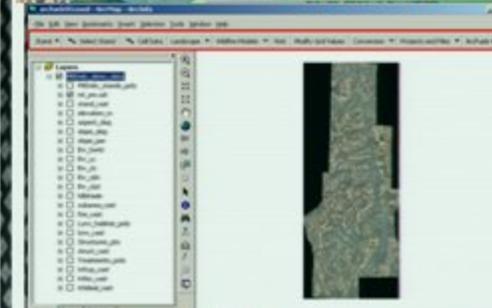
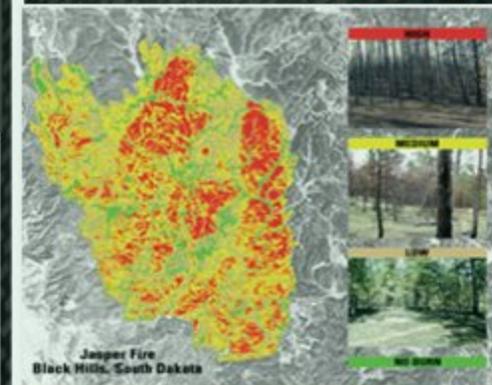
- LANDFIRE provides national geospatial data coverage for the US
- Southern Wildfire Risk Assessment provides geospatial data for the southern US
- FS Remote Sensing Applications Center (RSAC)



# Advances Since 2000

## SYSTEMS

- Monitoring Trends in Burn Severity (MTBS)



Wildland Fire  
Decision Support System

# Advances Since 2000

## SYSTEMS

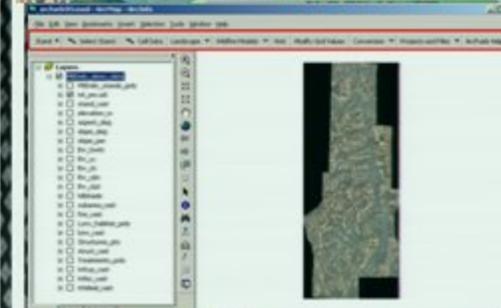
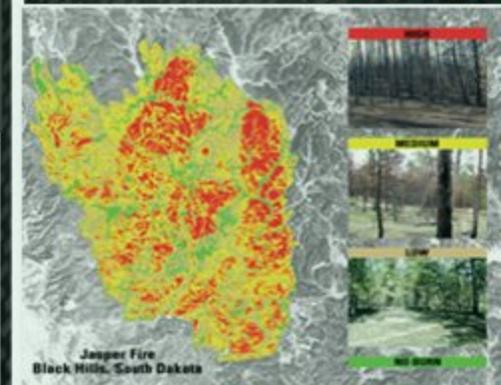
- Monitoring Trends in Burn Severity (MTBS)
- Minimum Travel Time (MTT) in FlamMap, FSPPro, and FSIM allow for relatively quick geospatial analysis for incident management and planning



# Advances Since 2000

## SYSTEMS

- Monitoring Trends in Burn Severity (MTBS)
- Minimum Travel Time (MTT) in FlamMap, FSPPro, and FSIM allow for relatively quick geospatial analysis for incident management and planning
- Fire Regime Condition Class (FRCC)



Wildland Fire  
Decision Support System

# Advances Since 2000

## SYSTEMS

- Monitoring Trends in Burn Severity (MTBS)
- Minimum Travel Time (MTT) in FlamMap, FSPro, and FSIM allow for relatively quick geospatial analysis for incident management and planning
- Fire Regime Condition Class (FRCC)
- Fuel Characteristic and Classification System (FCCS)



# Advances Since 2000

## SYSTEMS

- Monitoring Trends in Burn Severity (MTBS)
- Minimum Travel Time (MTT) in FlamMap, FSPPro, and FSIM allow for relatively quick geospatial analysis for incident management and planning
- Fire Regime Condition Class (FRCC)
- Fuel Characteristic and Classification System (FCCS)
- ArcFuels
- Wildland Fire Decision Support System (WFDSS) provides data, analysis, risk assessment and decision documentation for incidents.

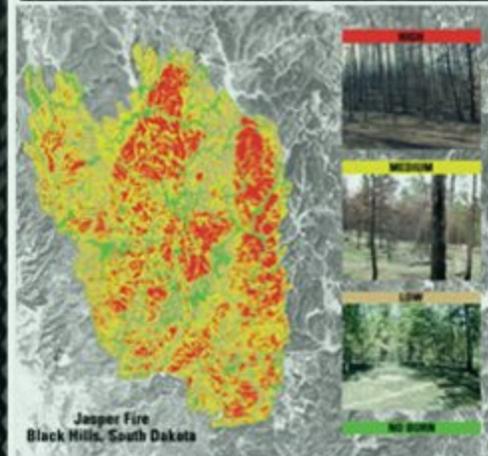


# Advances Since 2000

- Interagency Fuels Treatment Decision Support System (IFTDSS) provides data and analysis for planning.

## Interagency Fuels Treatment Decision Support System

Version 2.0 Beta

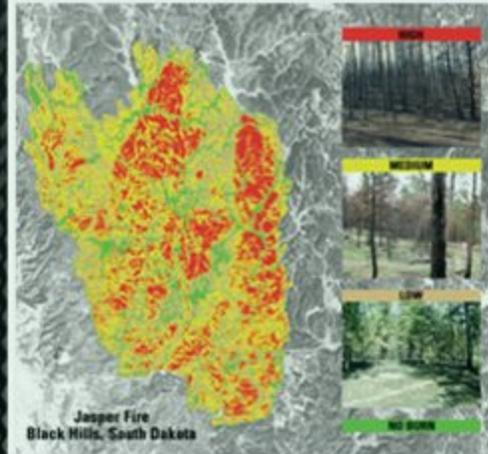


# Advances Since 2000

- Interagency Fuels Treatment Decision Support System (IFTDSS) provides data and analysis for planning.
- Spatial Fire Management Plans

## Interagency Fuels Treatment Decision Support System

Version 2.0 Beta

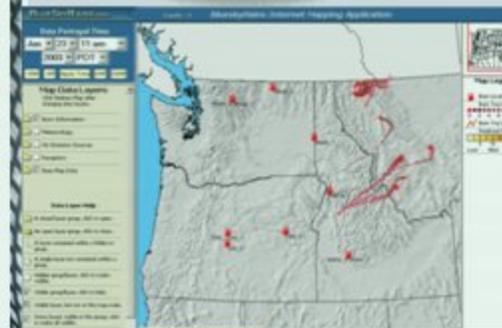
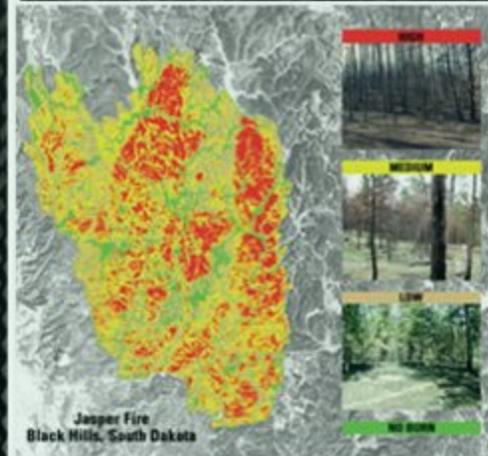


# Advances Since 2000

- Interagency Fuels Treatment Decision Support System (IFTDSS) provides data and analysis for planning.
- Spatial Fire Management Plans
- Fire Order Fire Effect Model (FOFEM)

## Interagency Fuels Treatment Decision Support System

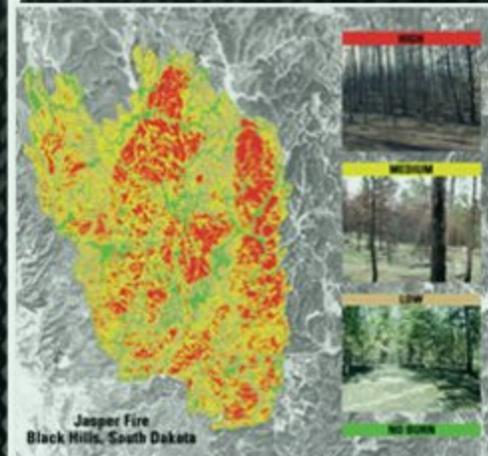
Version 2.0 Beta



# Advances Since 2000

- Interagency Fuels Treatment Decision Support System (IFTDSS) provides data and analysis for planning.
- Spatial Fire Management Plans
- Fire Order Fire Effect Model (FOFEM)
- BlueSky and Consume

Interagency Fuels Treatment  
Decision Support System  
Version 2.0 Beta



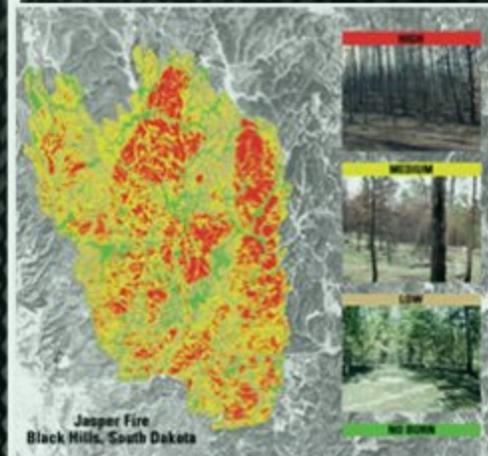
# Advances Since 2000

- Interagency Fuels Treatment Decision Support System (IFTDSS) provides data and analysis for planning.
- Spatial Fire Management Plans
- Fire Order Fire Effect Model (FOFEM)
- BlueSky and Consume
- Geospatial Equipment and Technology Application Group (GETA)



## Interagency Fuels Treatment Decision Support System

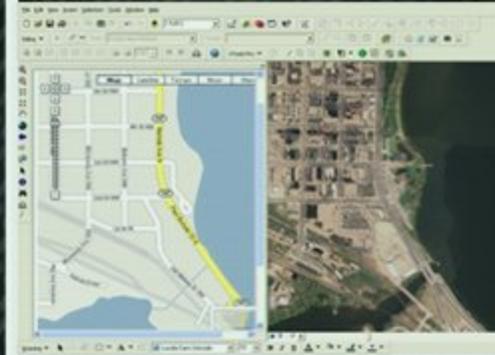
Version 2.0 Beta



# Advances Since 2000

## **INFORMATION TECHNOLOGY**

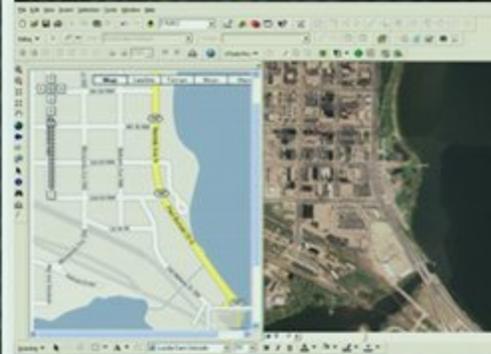
- GIS and Google Earth are readily available to fire managers



# Advances Since 2000

## INFORMATION TECHNOLOGY

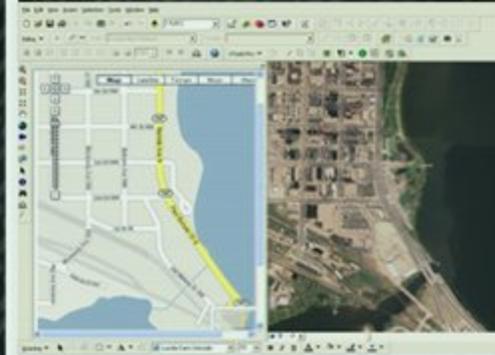
- GIS and Google Earth are readily available to fire managers
- Internet is readily available at most incident command posts



# Advances Since 2000

## INFORMATION TECHNOLOGY

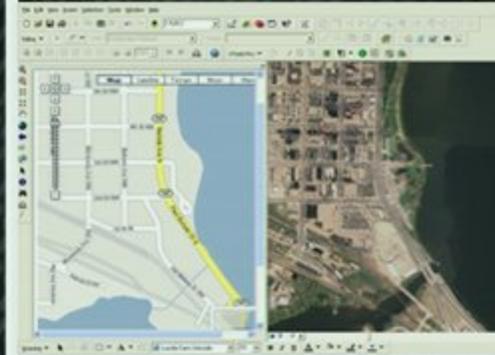
- GIS and Google Earth are readily available to fire managers
- Internet is readily available at most incident command posts
- Content Management Systems



# Advances Since 2000

## INFORMATION TECHNOLOGY

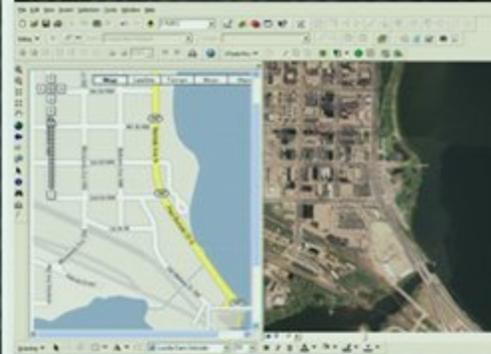
- GIS and Google Earth are readily available to fire managers
- Internet is readily available at most incident command posts
- Content Management Systems
- Laptops, Ipads, Iphones,



# Advances Since 2000

## INFORMATION TECHNOLOGY

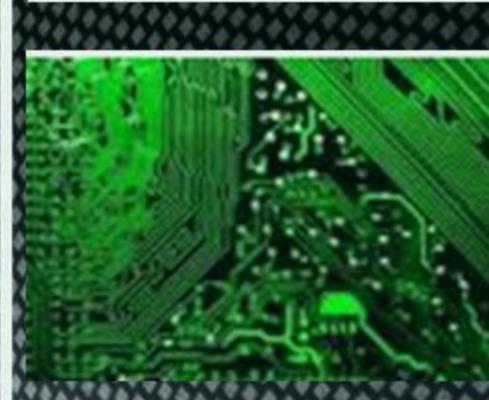
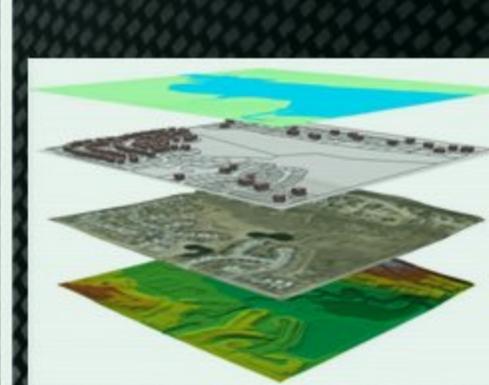
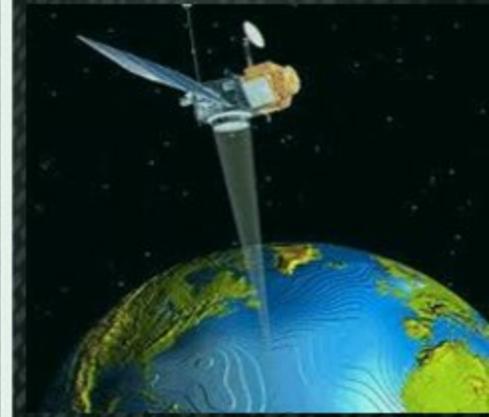
- GIS and Google Earth are readily available to fire managers
- Internet is readily available at most incident command posts
- Content Management Systems
- Laptops, Ipads, Iphones,
- Webinars, Video Tele Conference (VTC), YouTube, Twitter, Facebook



# Advances Since 2000

## TRAINING METHODS

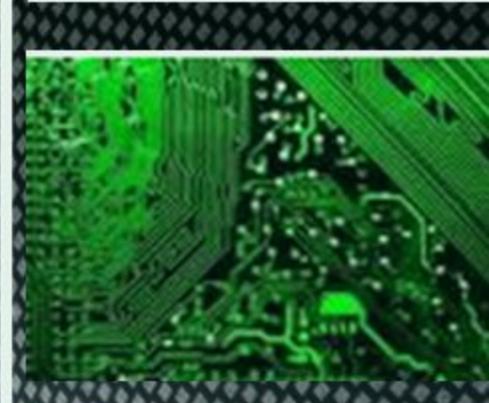
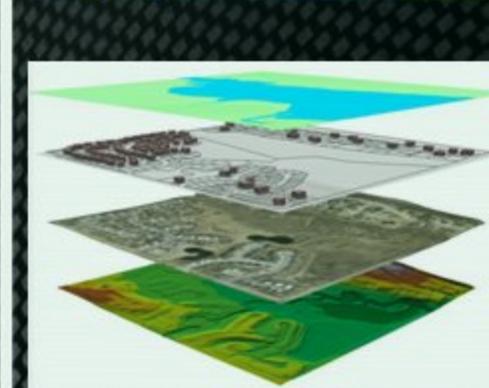
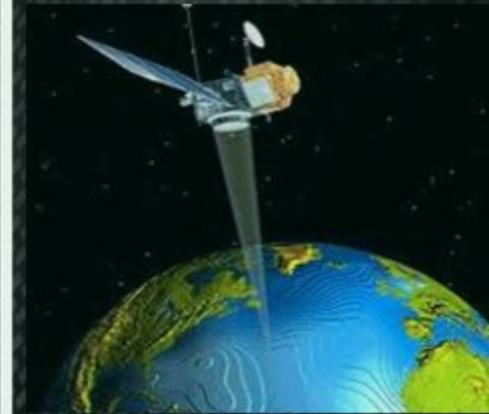
- Classroom
- Webinars
- Online Lessons
- System Help
- Workshops
- YouTube Videos
- Details/Internships



# Advances Since 2000

## ORGANIZATIONS PROVIDING TRAINING

- Universities
- NWCG
- National Interagency Fuels Technology Transfer (NIFTT)
- GETA
- ArcFuels
- FCCS
- IFTDSS
- Wildland Fire Management RD&A
- RSAC
- Lessons Learned Center
- JFSP Regional Consortia
- Fire Modeling Institute



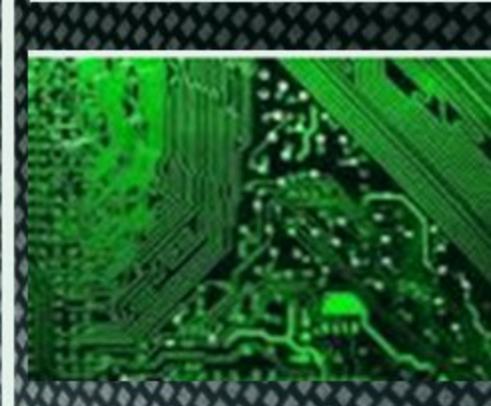
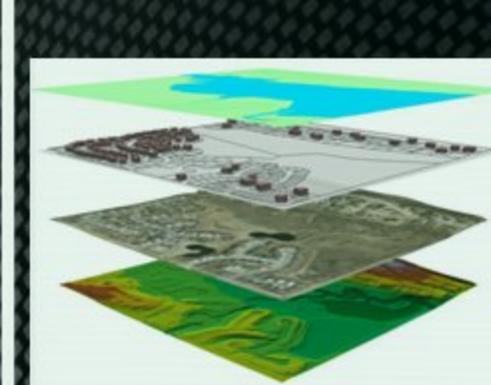
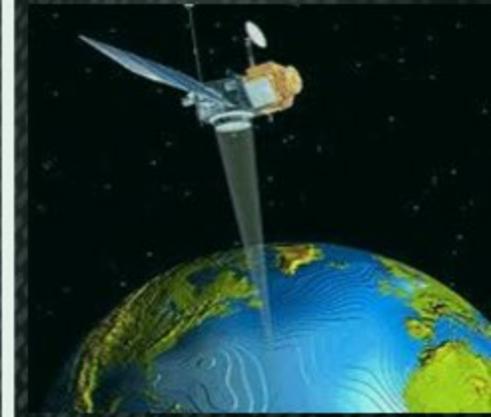
# Advances Since 2000

## UNIVERSITIES

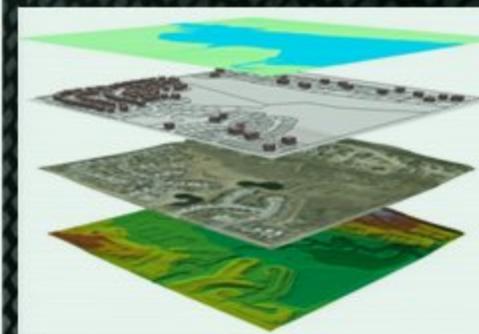
More than 20 universities offer fire science programs, several with academic majors and undergraduate certificate programs.

University of Idaho has been lead institution with an academic major, online materials, coordination with agencies and organizations to provide practical experience.

Source: Kobziar, Leda N., et. al. 2009. Challenges to educating the next generation of wildland fire professionals in the United States. *Journal of Forestry*, vol. 107, no. 7, p. 339 – 345.



# Advances Since 2000



# Advances Since 2000



**National Interagency Fuels Technology Transfer (NIFTT)**

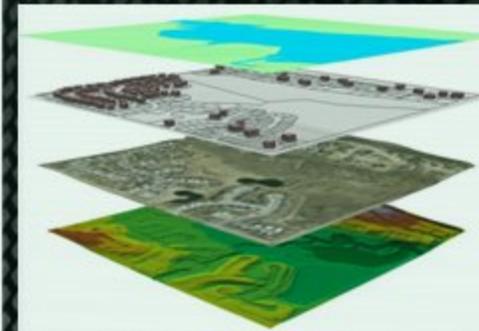
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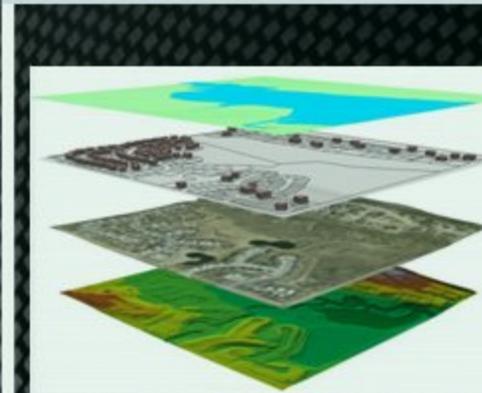
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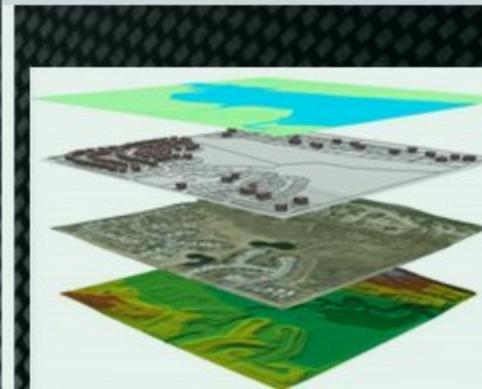
5th International Fire Ecology and Management Congress in Portland, OR, December 3, 2012, 8 hours. The workshop is free for registered conference attendees. <http://afefirecongress.org/>

4th Fire Behavior and Fuels Conference in Raleigh, NC, February 18, 2012, 4 hours. The cost is \$35 for registered conference attendees: <http://www.iawfonline.org/2013FuelsConference/CFP.php>

### Past Training and Workshops

[ArcFuels Overview Webinar](#)

- 11/14-15/2012 - Yreka CA. Klamath National Forest



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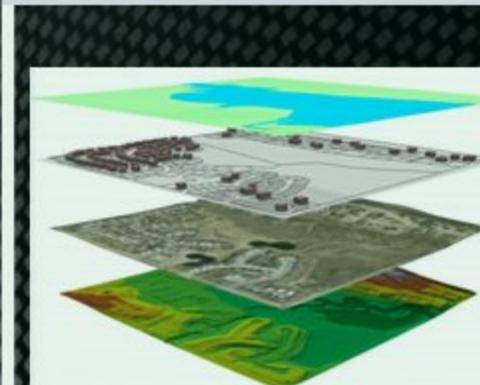
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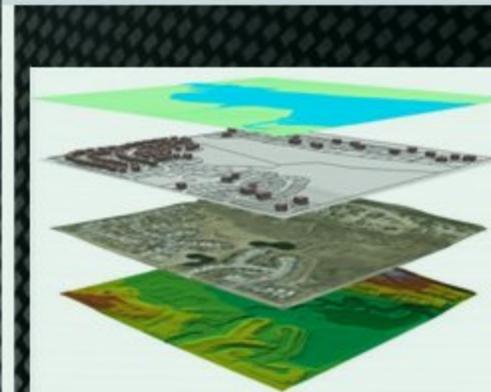
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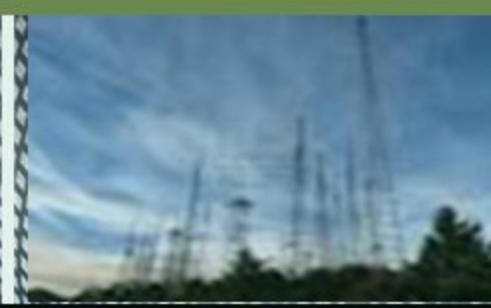
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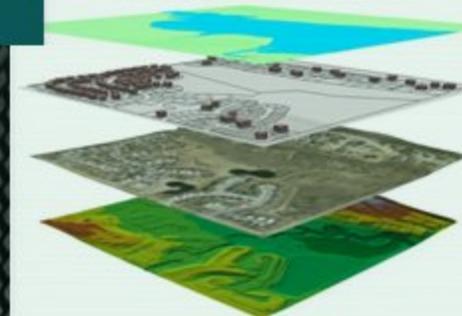
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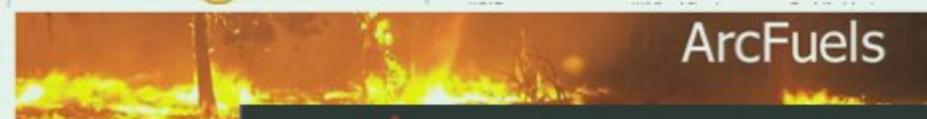
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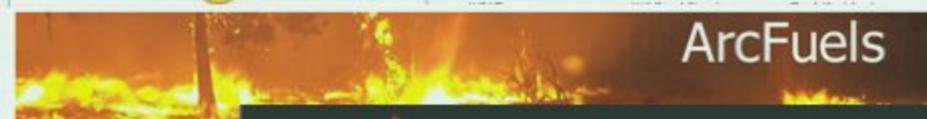
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Learned  
Center

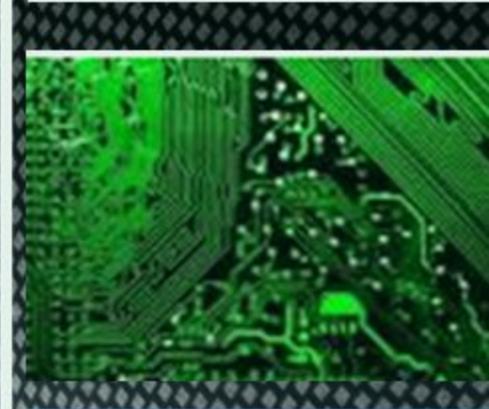
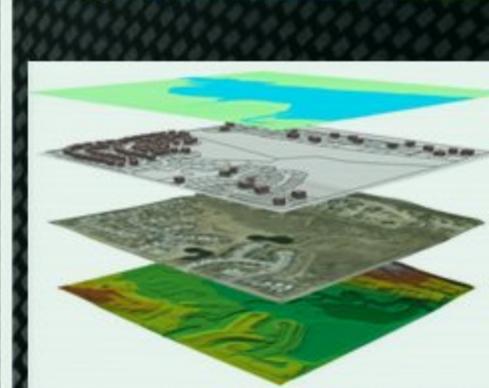
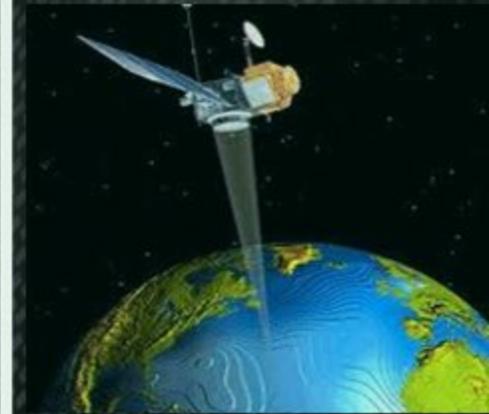
Wildland  
Fire



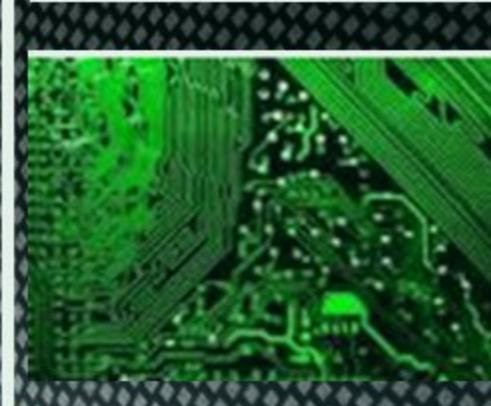
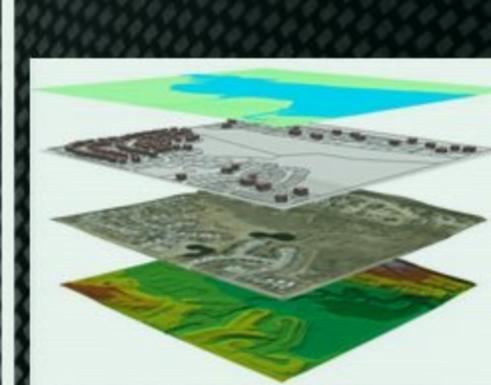
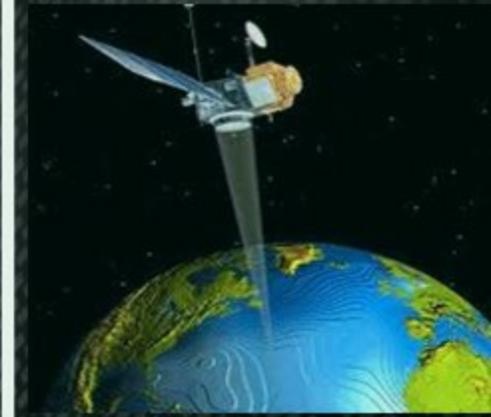
# Advances Since 2000

## Professional Development Triangle

AFE Education Committee, 2009



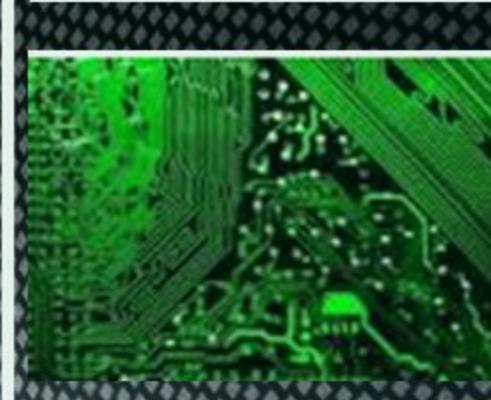
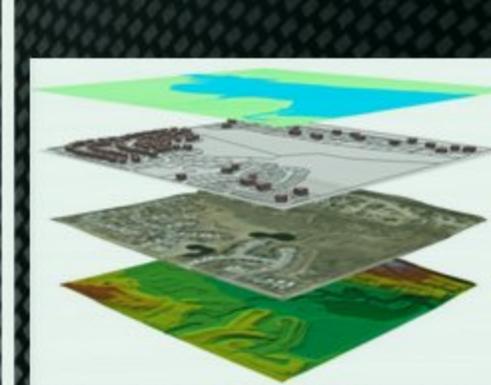
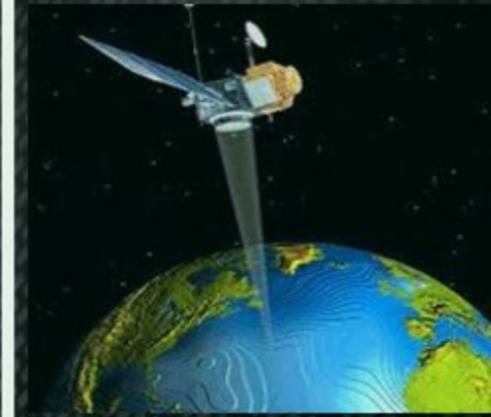
# Future Opportunities and Challenges in Training



# Future Opportunities and Challenges

## DATA

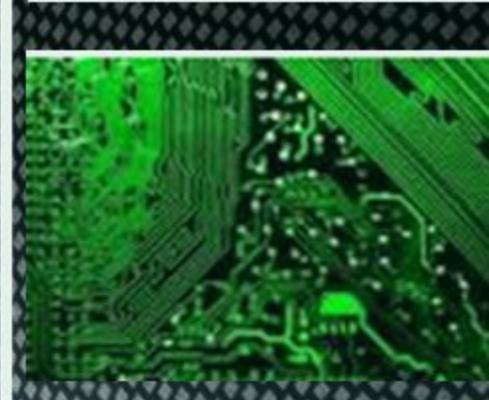
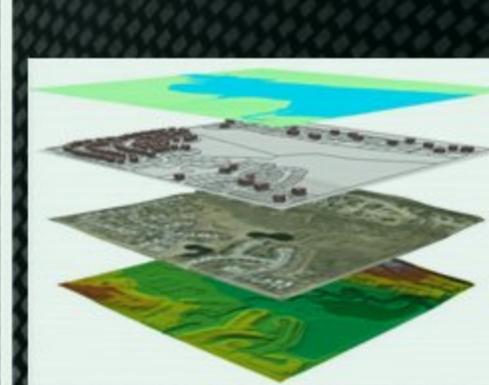
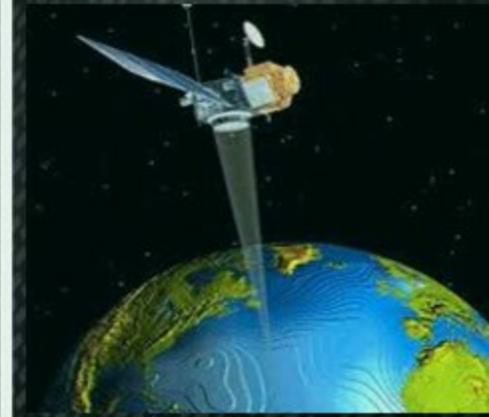
- Incorporate local management and issues, including fuel treatments – methods not clear, training not available



# Future Opportunities and Challenges

## DATA

- Incorporate local management and issues, including fuel treatments – methods not clear, training not available
- Standards for geospatial data



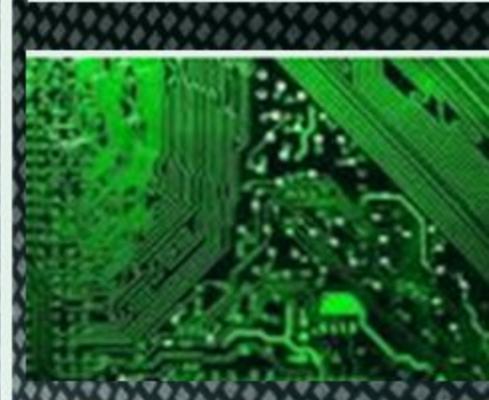
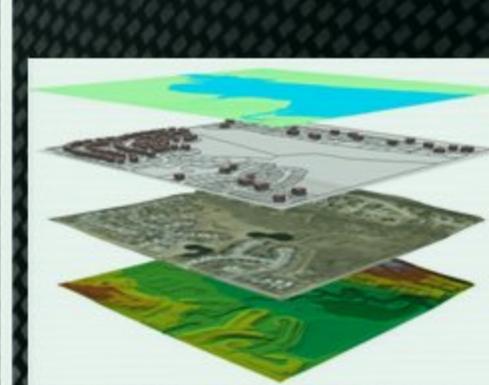
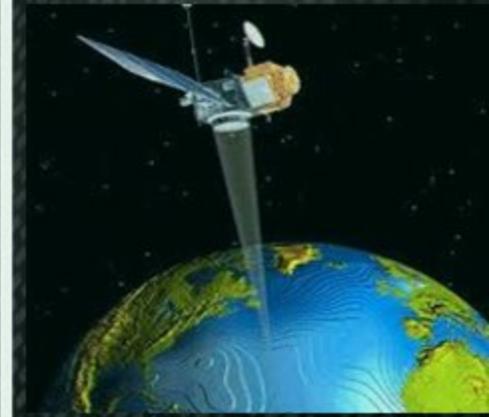
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## SYSTEMS

- Develop assistance in choosing which systems to use for application.



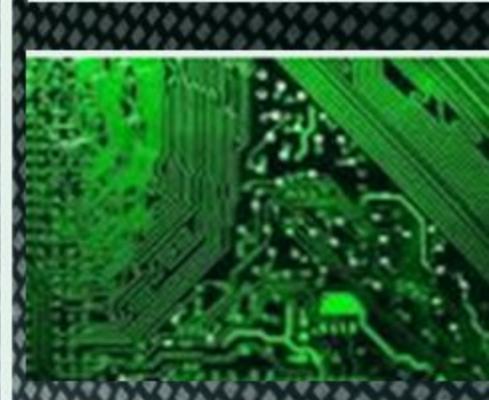
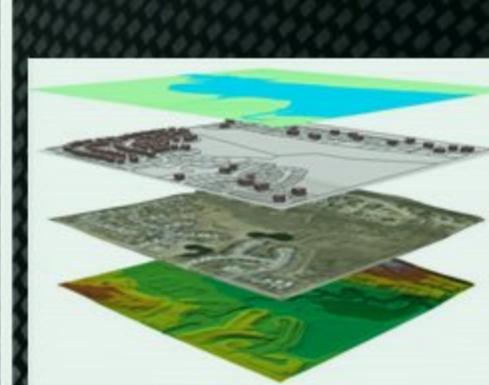
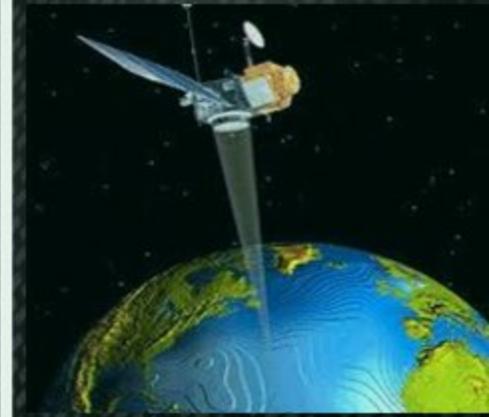
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## DATA

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## SYSTEMS

- Develop assistance in choosing which systems to use for application.
- Maintain systems



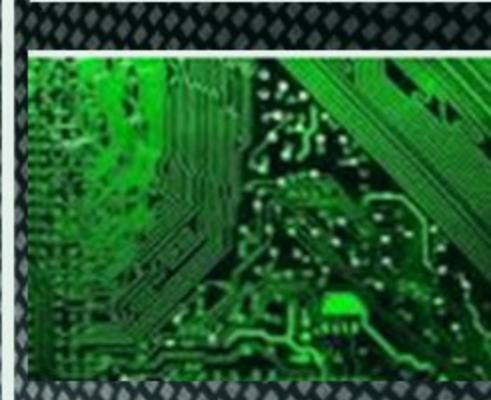
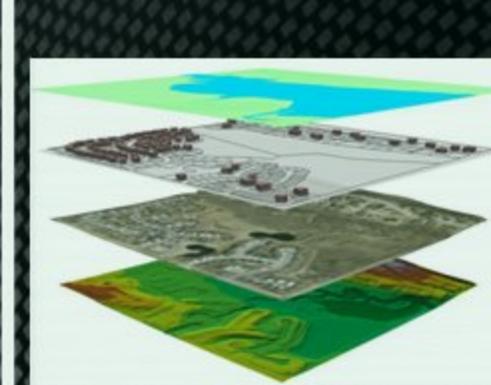
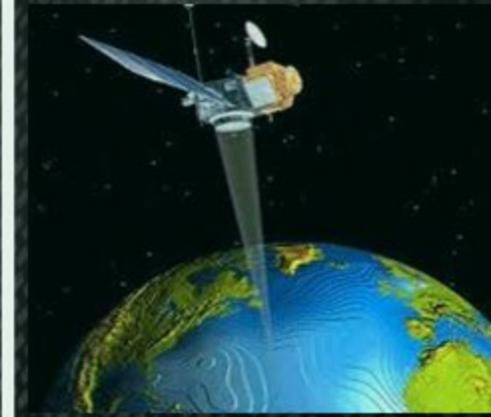
# Future Opportunities and Challenges

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- Update/develop new systems as research improves algorithms for fire spread.



# Future Opportunities and Challenges

## DATA

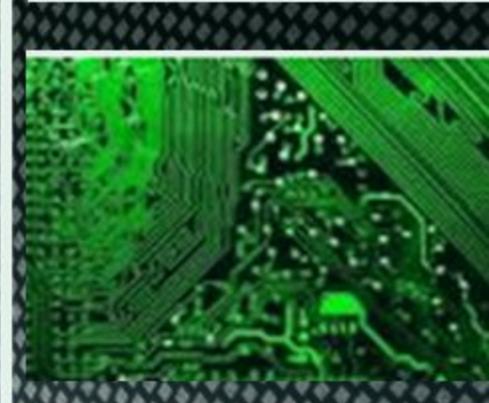
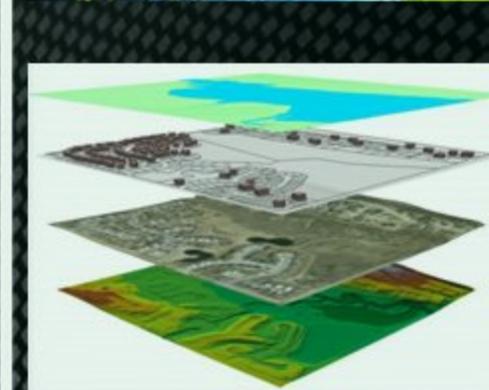
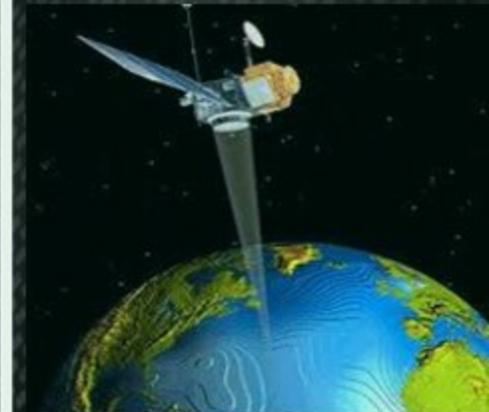
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## INFORMATION TECHNOLOGY

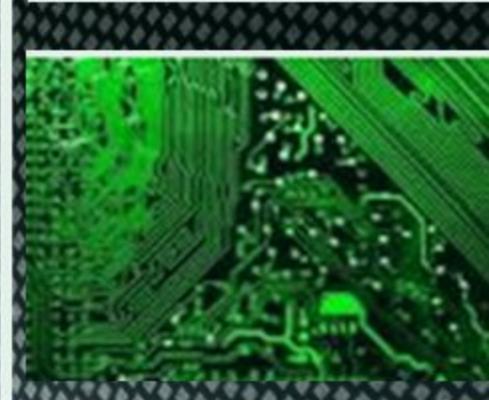
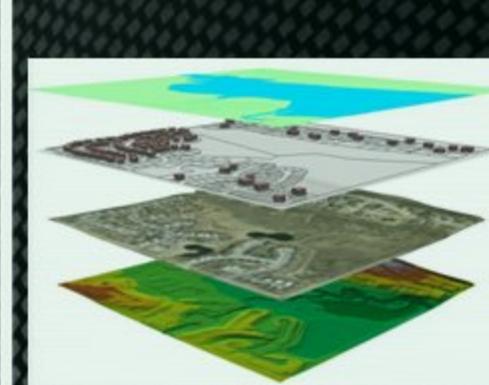
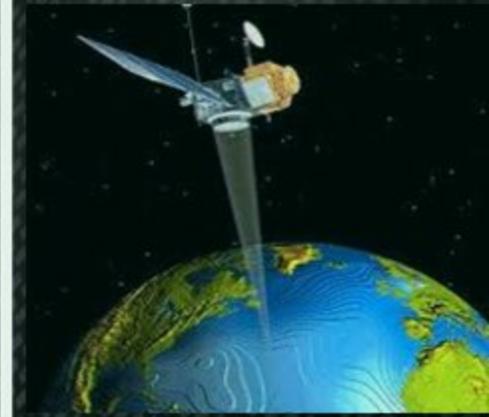
- Determine for which devices to provide training



# Future Opportunities and Challenges

## TRAINING

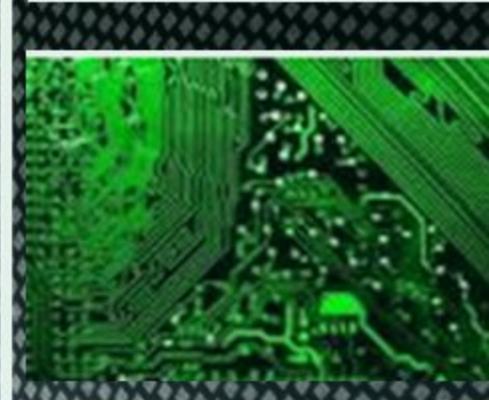
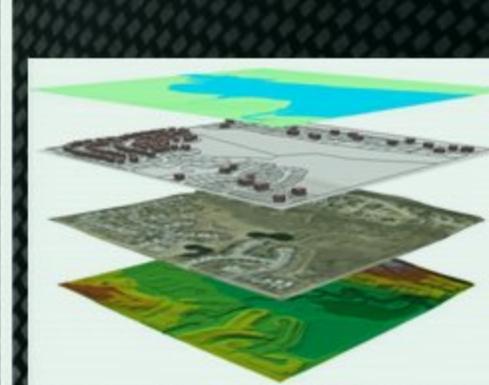
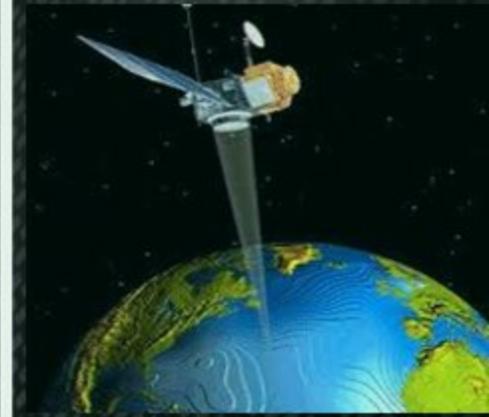
- Incorporate new development methods



# Future Opportunities and Challenges

## TRAINING

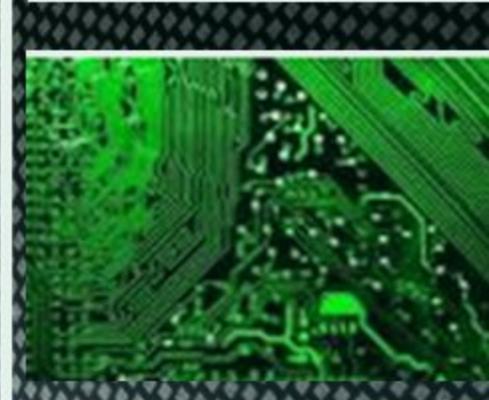
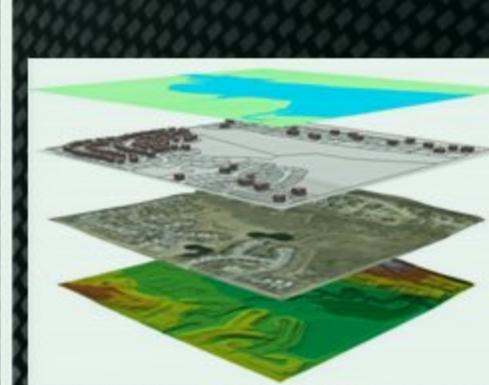
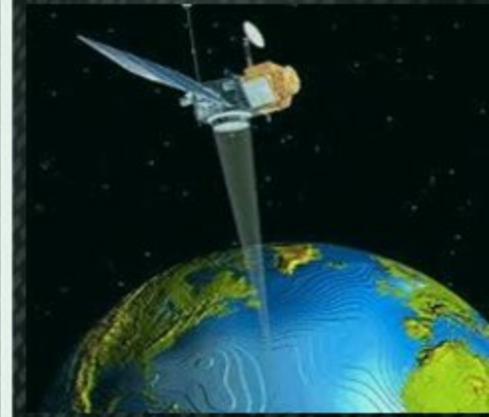
- Incorporate new development methods
- Training development is significant investment



# Future Opportunities and Challenges

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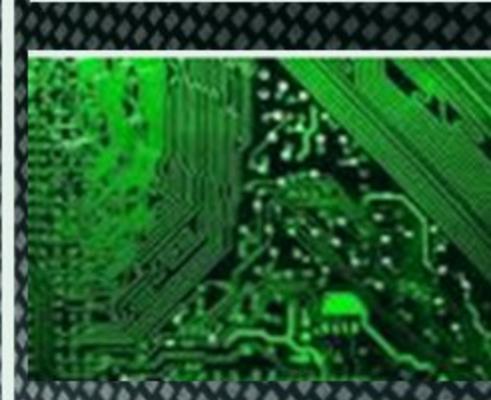
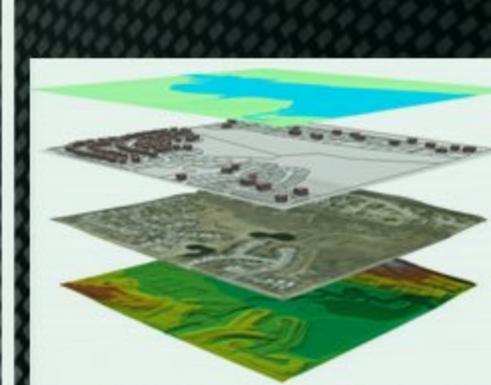
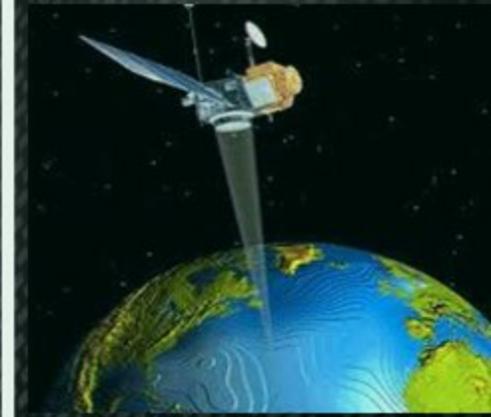
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# Future Opportunities and Challenges

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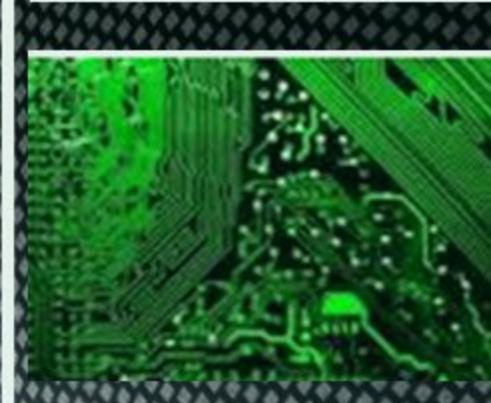
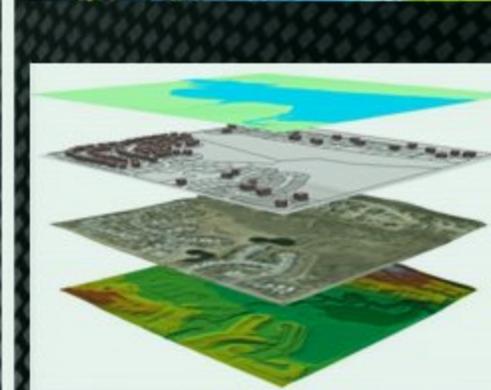
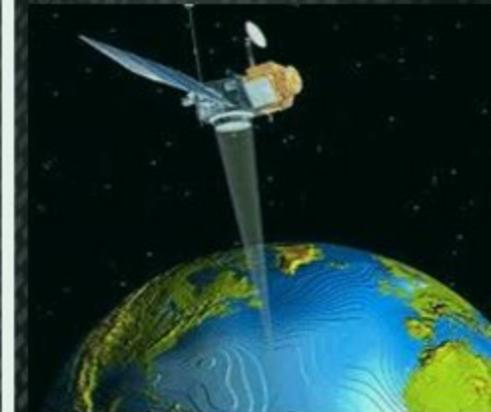
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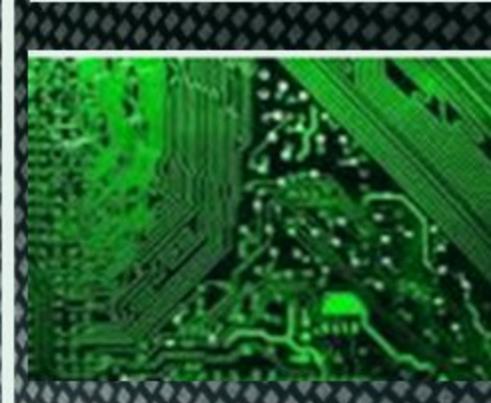
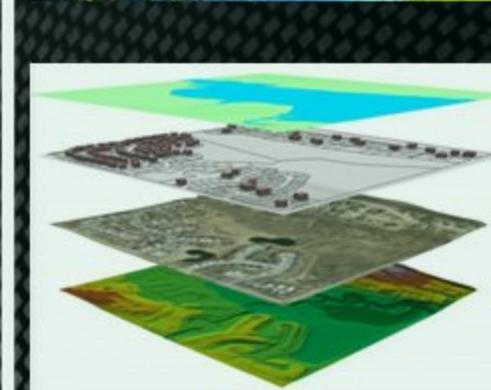
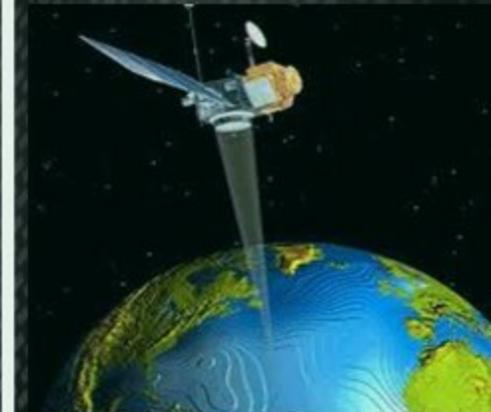
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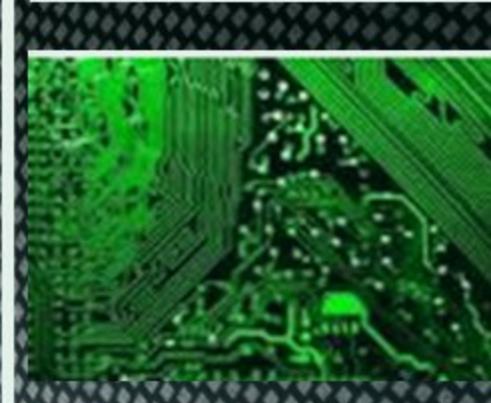
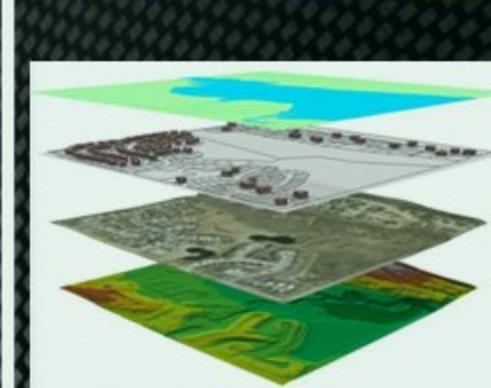
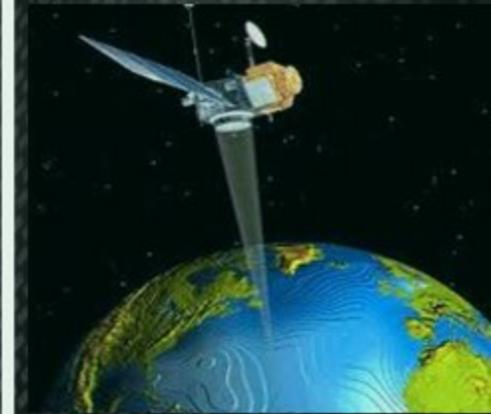
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# Future Opportunities and Challenges

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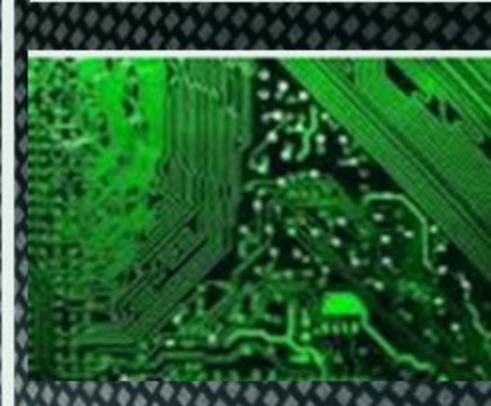
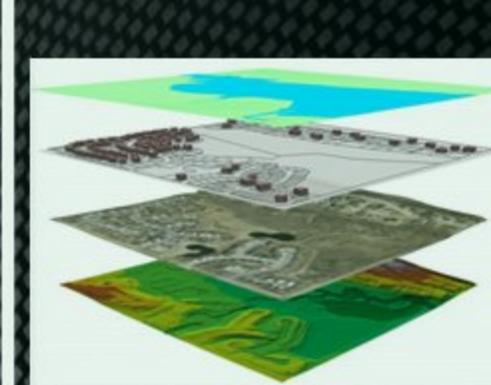
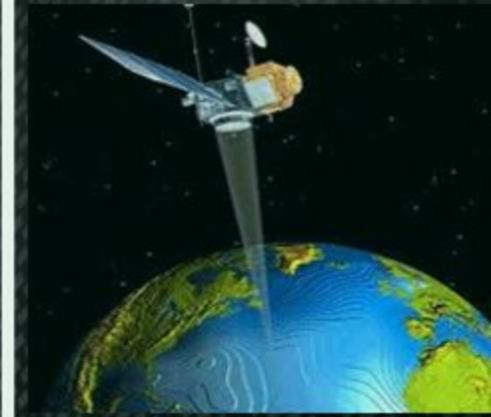
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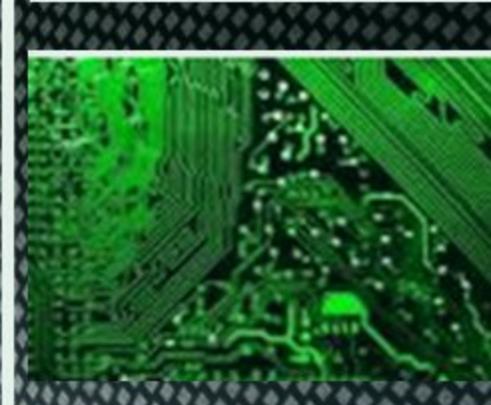
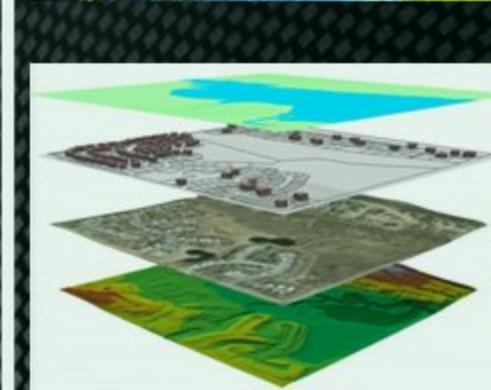
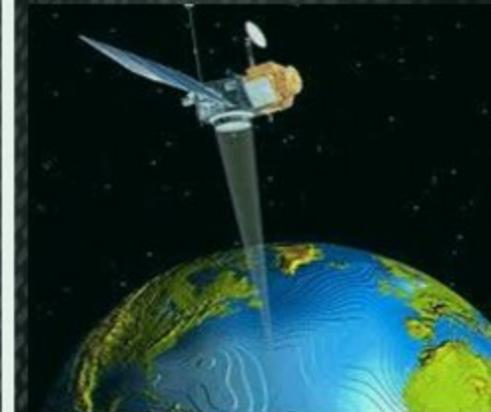
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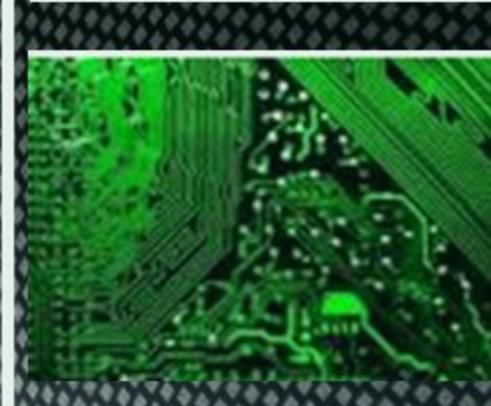
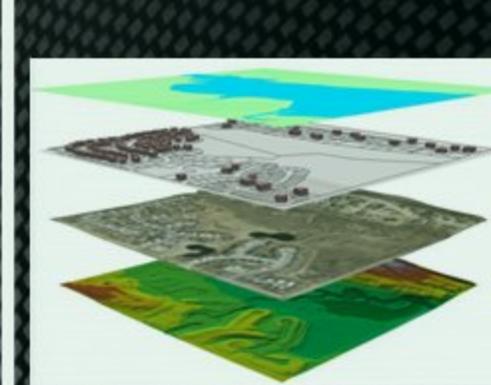
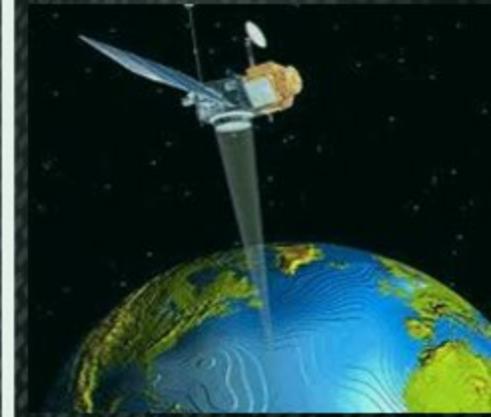
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- Attitudes toward learning - incentives, time, money

