GALE IN CONTEXT Environmental Studies 操作指南2020

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GALE
IN CONTEXT
Environmental Studies

Gale资源中心：
环境研究

介绍

Gale资源中心：环境研究 为学生和研究者带来综合性的信息，用以批判性的分析和理解整个环境研究领域内的议题以及全球视角下的人文问题。

- 提供多种多样的内容

用户可以访问来自地方性和国际性出版物的内容，以及屡获殊荣的Gale参考书内容，了解各种论据翔实的观点。

- 访问综合性的数据库

专题页面汇集文章、案例研究、统计数据、图片等内容。

丰富多样的主题，例如气候变化、食品安全、土壤生态学和旅游等。

- 轻松探索多个主题

平台界面友好，适配主流移动终端设备，操作简单、快捷，更有针对性的研究学习辅助工具，帮助学者将更多的时间集中在信息的深度分析和挖掘中

- 满足跨学科教学需求

支持科学、社会研究和人文学科领域内关注环境与可持续发展问题的学生和研究者。

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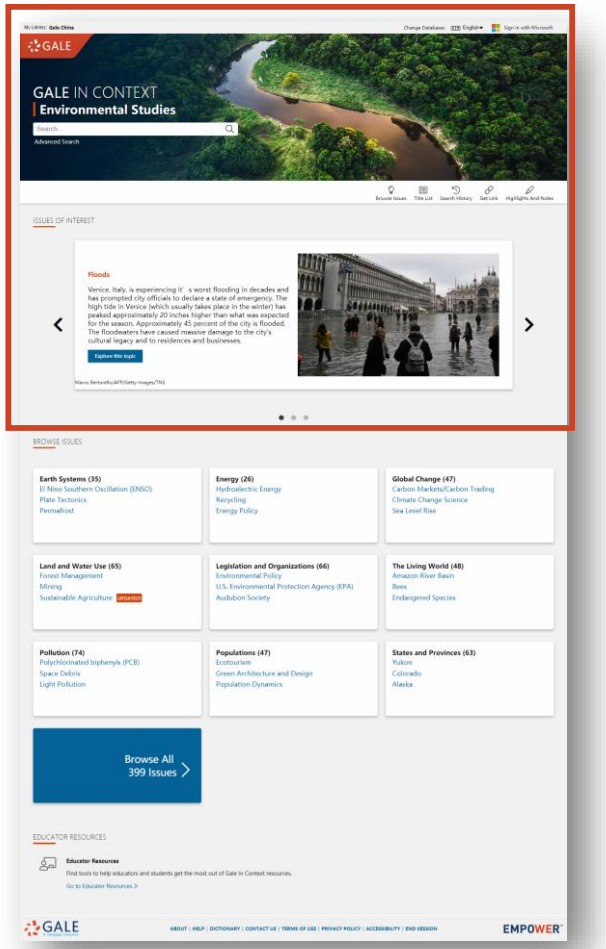
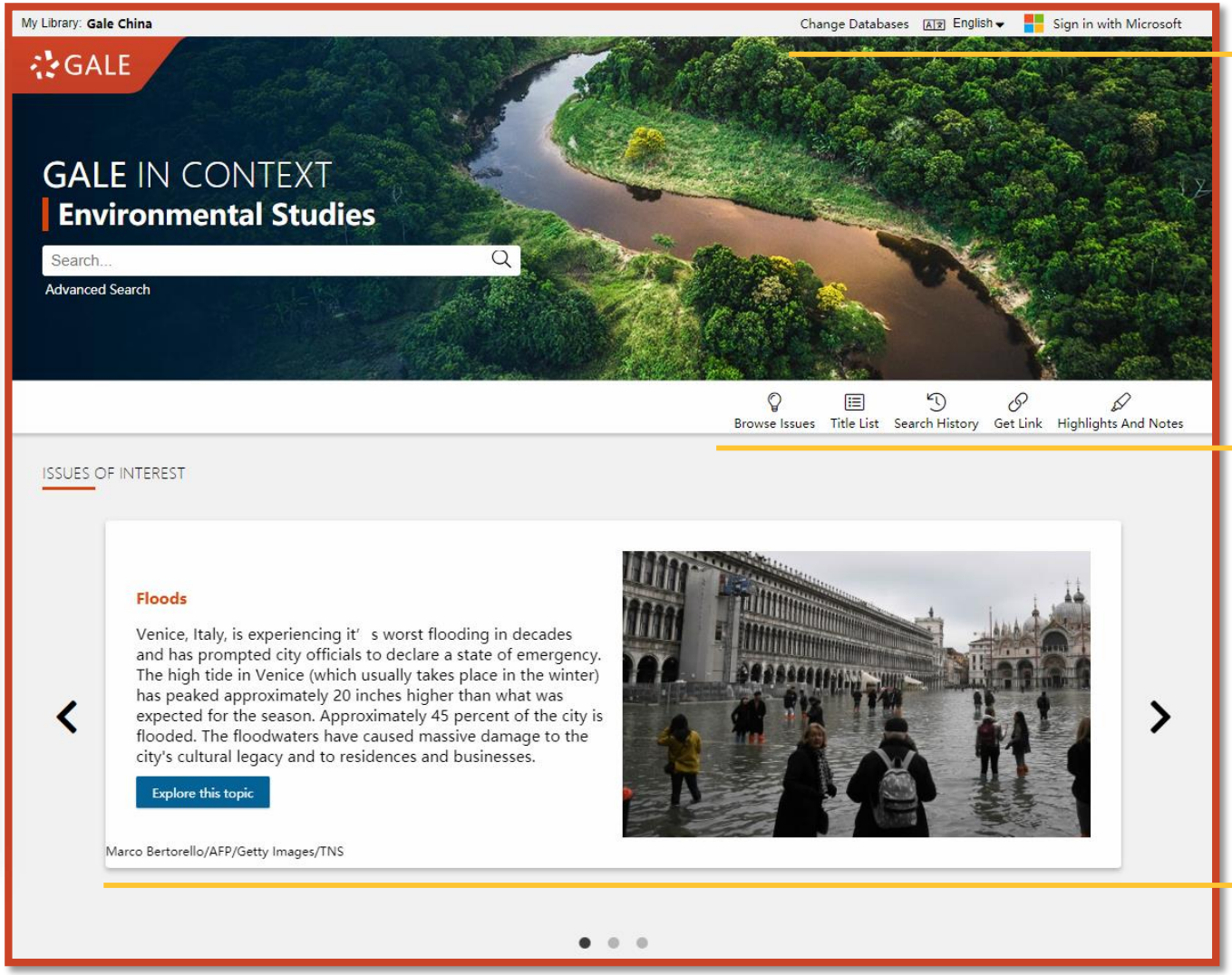
Interface 登录界面



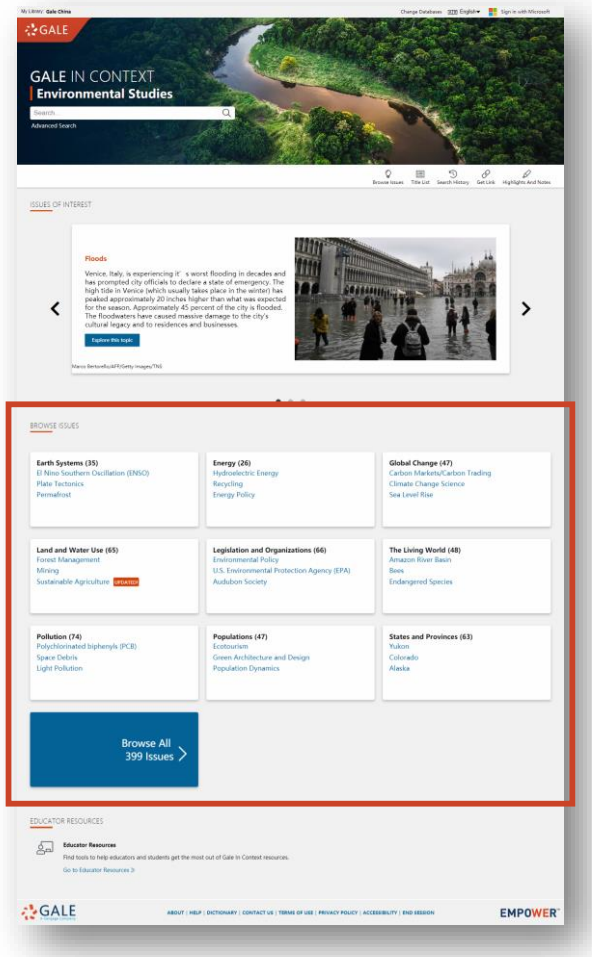


操作界面语言翻译/登录个人微软账户

话题浏览
资源列表
检索历史
固定链接
标注与笔记

话题推荐

Interface 登录界面



话题浏览

9大类话题/细分399个不同主题/更新和新增主题高亮显示

BROWSE ISSUES

Earth Systems (35)
- El Nino Southern Oscillation (ENSO)
- Plate Tectonics
- Permafrost

Energy (26)
- Hydroelectric Energy UPDATED!
- Recycling UPDATED!
- Energy Policy NEW!

Global Change (47)
- Carbon Markets/Carbon Trading UPDATED!
- Climate Change Science
- Sea Level Rise

Land and Water Use (65)
- Forest Management NEW!
- Mining UPDATED!
- Sustainable Agriculture UPDATED!

Legislation and Organizations (66)
- Environmental Policy UPDATED!
- U.S. Environmental Protection Agency (EPA) UPDATED!
- Audubon Society

The Living World (48)
- Amazon River Basin NEW!
- Bees NEW!
- Endangered Species UPDATED!

Pollution (74)
- Polychlorinated biphenyls (PCB) NEW!
- Space Debris NEW!
- Light Pollution UPDATED!

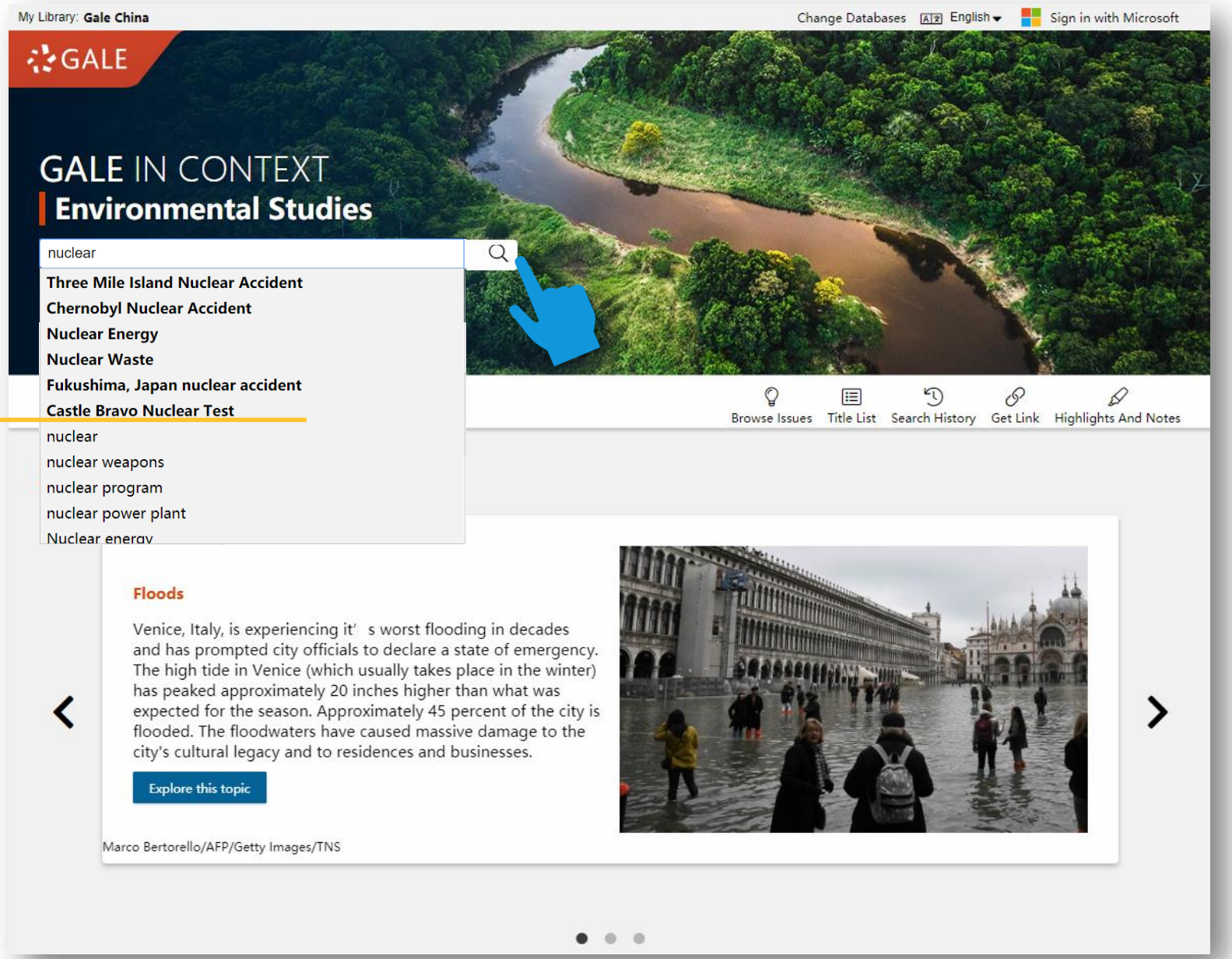
Populations (47)
- Ecotourism NEW!
- Green Architecture and Design UPDATED!
- Population Dynamics NEW!

States and Provinces (63)
- Yukon UPDATED!
- Colorado UPDATED!
- Alaska UPDATED!

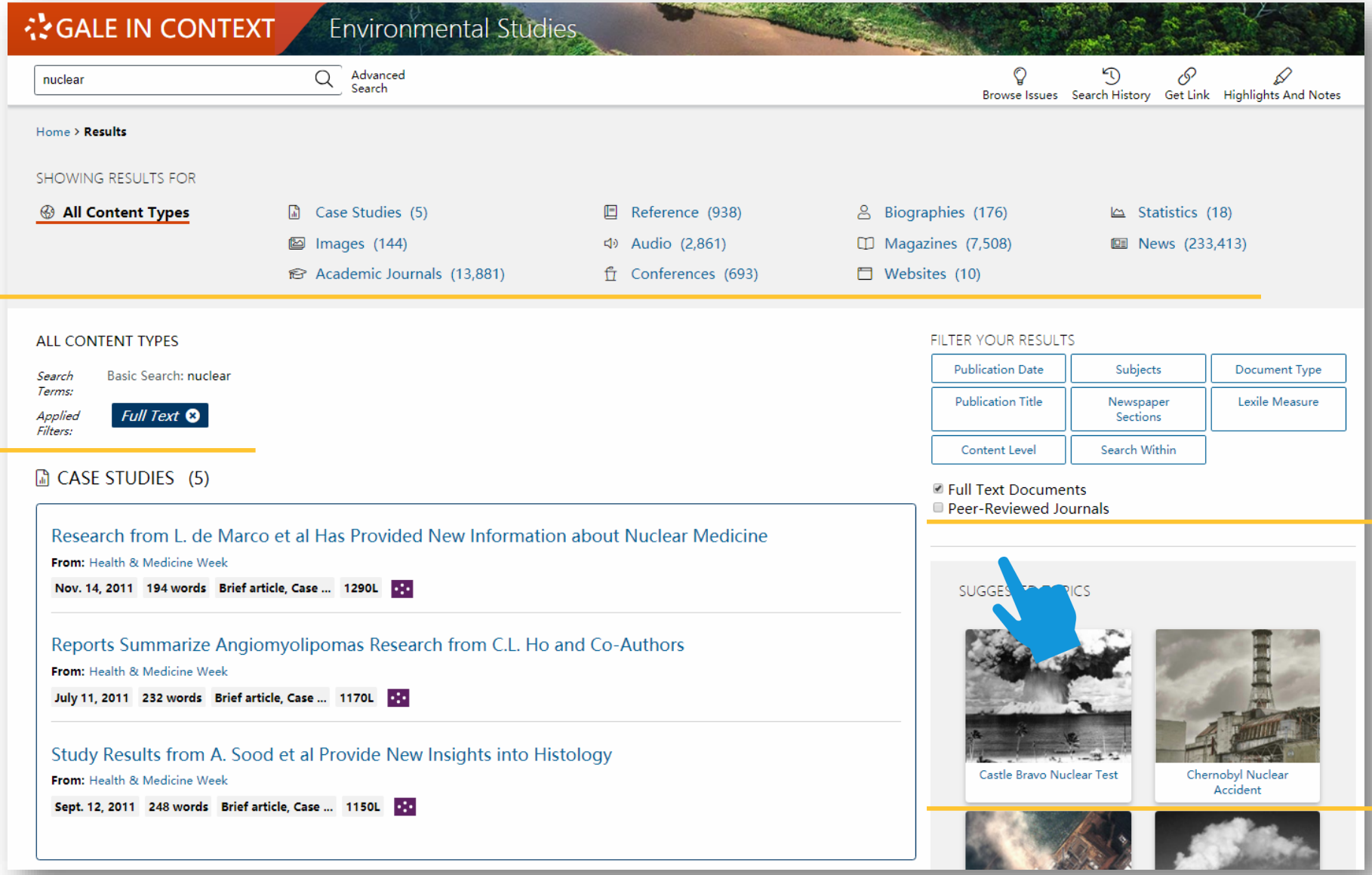
Browse All
399 Issues

Search 检索

以检索“nuclear”为例
关键词联想辅助



Result 检索结果



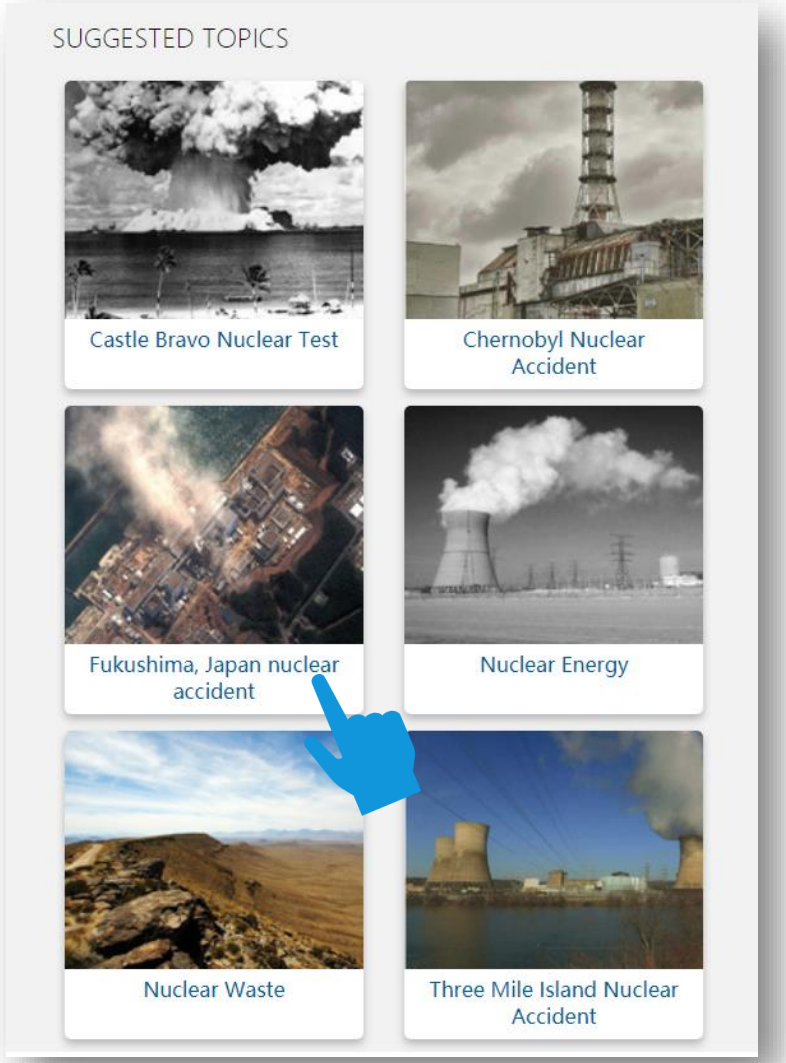
结果类型统计

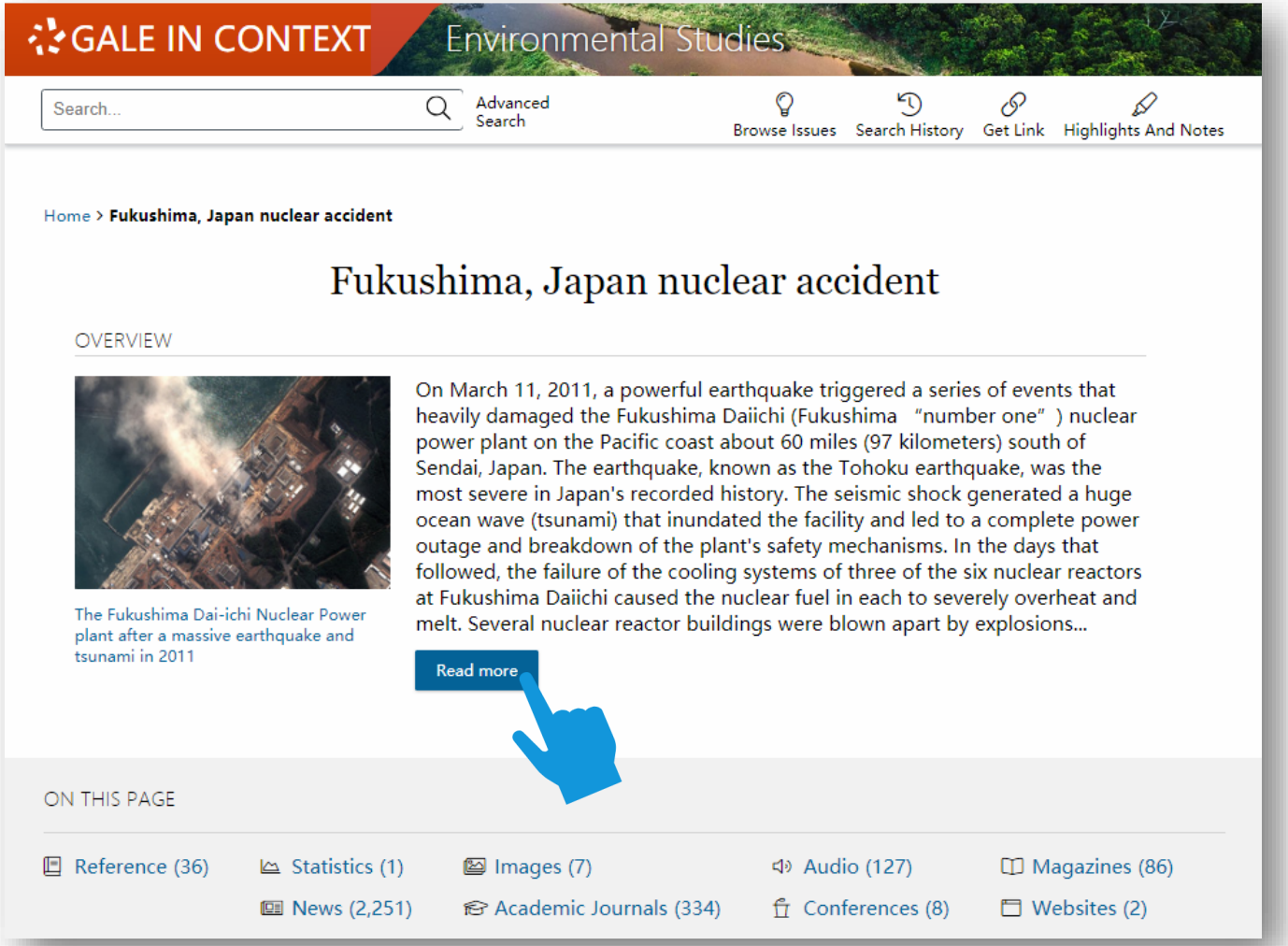
当前分类下结果数量和排序/检索方式

过滤当前结果
出版时限
主题
类型
刊物
二次检索
全文
同行评审等

话题推荐

Suggested topics 话题推荐





Article 文章

文章翻译
字体调整
语音朗读

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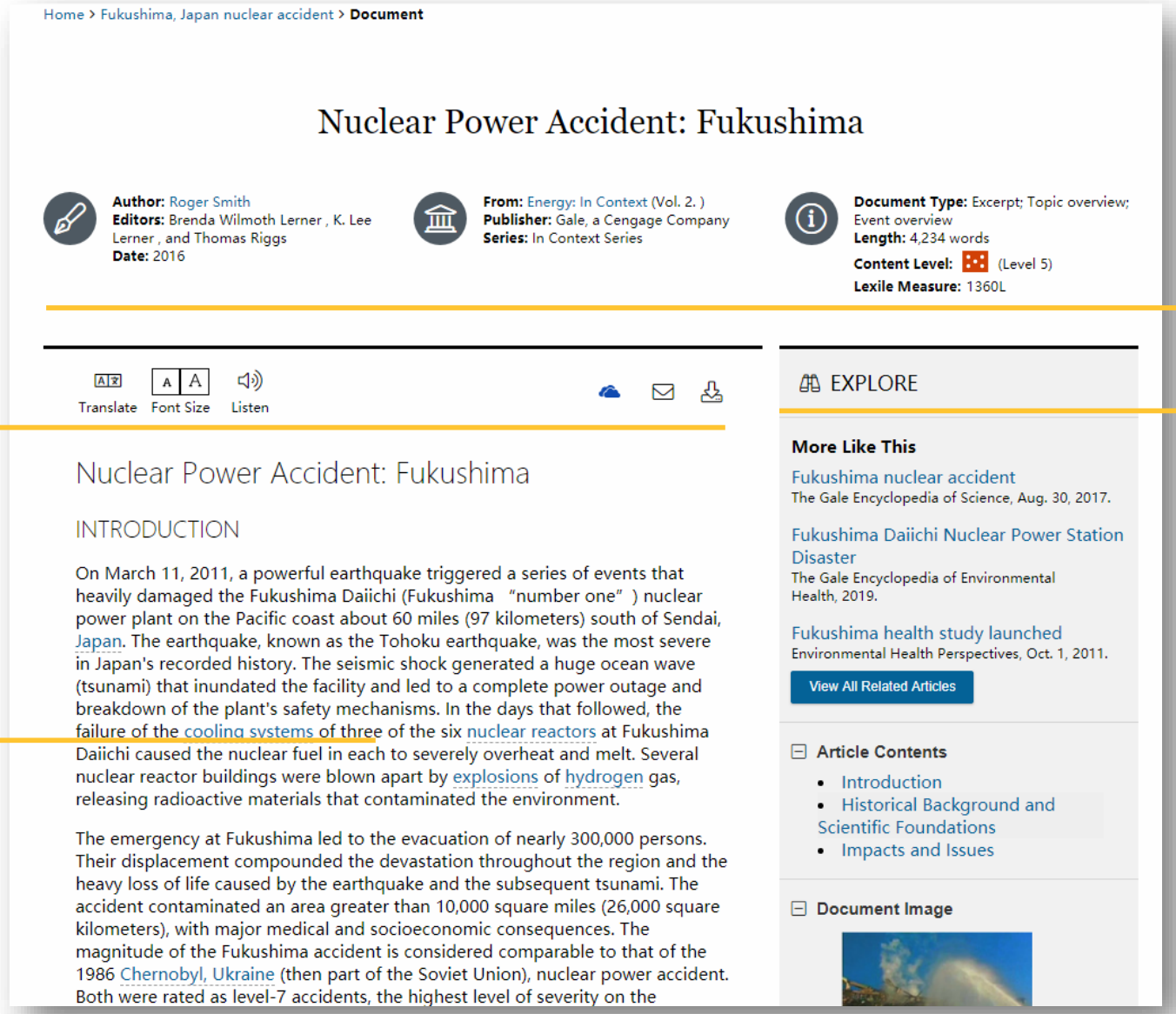
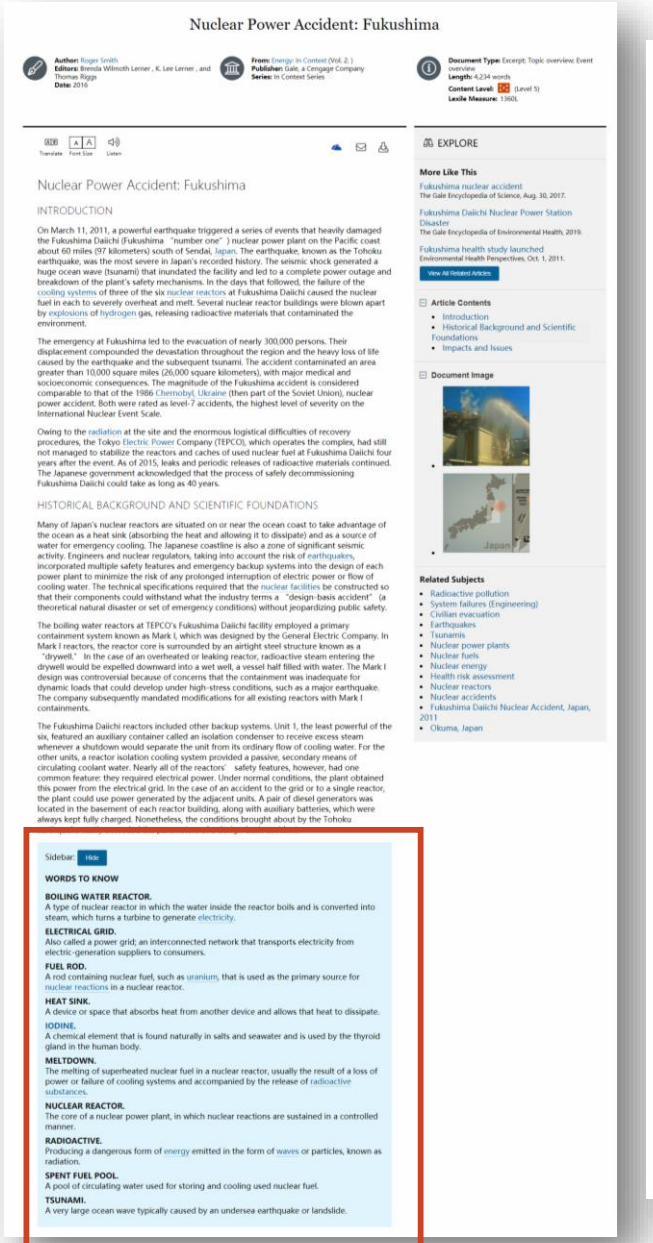
关键词话题超链接



文章基本信息

相关内容推荐
文章目录
图标信息
相关主题等

Useful tools 功能展示


Nuclear Power Accident: Fukushima

Author: Roger Smith
Editors: Brenda Wilmoth Lerner , K. Lee Lerner , and Thomas Riggs
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Nuclear Power Accident: Fukushima

INTRODUCTION

On March 11, 2011, a powerful earthquake triggered a series of events that heavily damaged the Fukushima Daiichi (Fukushima "number one") nuclear power plant on the Pacific coast about 60 miles (97 kilometers) south of Sendai, Japan. The earthquake, known as the Tohoku earthquake, was the most severe in Japan's recorded history. The seismic shock generated a huge ocean wave (tsunami) that inundated the facility and led to a complete power outage and breakdown of the plant's safety mechanisms. In the days that followed, the failure of the cooling systems of three of the six nuclear reactors at Fukushima Daiichi caused the nuclear fuel in each to severely overheat and melt. Several nuclear reactor buildings were blown apart by explosions of hydrogen gas, releasing radioactive materials that contaminated the environment.

The emergency at Fukushima led to the evacuation of nearly 300,000 persons. Their displacement compounded the devastation throughout the region and the heavy loss of life caused by the earthquake and the subsequent tsunami. The accident contaminated an area greater than 10,000 square miles (26,000 square kilometers), with major medical and socioeconomic consequences. The magnitude of the Fukushima accident is considered comparable to that of the 1986 Chernobyl, Ukraine (then part of the Soviet Union), nuclear power accident. Both were rated as level-7 accidents, the highest level of severity on the International Nuclear Event Scale.

Owing to the radiation at the site and the enormous logistical difficulties of recovery procedures, the Tokyo Electric Power Company (TEPCO), which operates the complex, had still not managed to stabilize the reactors and caches of used nuclear fuel at Fukushima Daiichi four years after the event. As of 2015, leaks and periodic releases of radioactive materials continued. The Japanese government acknowledged that the process of safely decommissioning Fukushima Daiichi could take as long as 40 years.

HISTORICAL BACKGROUND AND SCIENTIFIC FOUNDATIONS

Many of Japan's nuclear reactors are situated on or near the ocean coast to take advantage of the ocean as a heat sink (absorbing the heat and allowing it to dissipate) and as a source of water for emergency cooling. The Japanese coastline is also a zone of significant seismic activity. Engineers and nuclear regulators, taking into account the risk of earthquakes, incorporated multiple safety features and emergency backup systems into the design of each power plant to minimize the risk of any prolonged interruption of electric power or flow of cooling water. The technical specifications required that the nuclear facilities be constructed so that their components could withstand what the industry terms a "design-basis accident" (a theoretical natural disaster or set of emergency conditions) without jeopardizing public safety.

The boiling water reactors at TEPCO's Fukushima Daiichi facility employed a primary containment system known as Mark I, which was designed by the General Electric Company. In Mark I reactors, the reactor core is surrounded by an airtight steel structure known as a "drywell." In the case of an overheated or leaking reactor, radioactive steam entering the drywell would be expelled downward into a wet well, a vessel half filled with water. The Mark I design was controversial because of concerns that the containment was inadequate for dynamic loads that could develop under high-stress conditions, such as a major earthquake. The company subsequently mandated modifications for all existing reactors with Mark I containments.

The Fukushima Daiichi reactors included other backup systems. Unit 1, the least powerful of the six, featured an auxiliary container called an isolation condenser to receive excess steam whenever a shutdown would separate the unit from its ordinary flow of cooling water. For the other units, a reactor isolation cooling system provided a passive, secondary means of circulating coolant water. Nearly all of the reactors' safety features, however, had one common feature: they required electrical power. Under normal conditions, the plant obtained this power from the electrical grid. In the case of an accident to the grid or to a single reactor, the plant could use power generated by the adjacent units. A pair of diesel generators was located in the basement of each reactor building, along with auxiliary batteries, which were always kept fully charged. Nonetheless, the conditions brought about by the Tohoku

EXPLORE

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Environmental Health Perspectives, Oct. 1, 2011.
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- Introduction
- Historical Background and Scientific Foundations
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Related Subjects
- Radioactive pollution
- System failures (Engineering)
- Civilian evacuation
- Earthquakes
- Tsunamis
- Nuclear power plants
- Nuclear fuels
- Nuclear energy
- Health risk assessment
- Nuclear reactors
- Nuclear accidents
- Fukushima Daiichi Nuclear Accident, Japan, 2011
- Okuma, Japan

Sidebar: Hide

WORDS TO KNOW

BOILING WATER REACTOR.
A type of nuclear reactor in which the water inside the reactor boils and is converted into steam, which turns a turbine to generate electricity.

ELECTRICAL GRID.
Also called a power grid; an interconnected network that transports electricity from electric-generation suppliers to consumers.

FUEL ROD.
A rod containing nuclear fuel, such as uranium, that is used as the primary source for nuclear reactions in a nuclear reactor.

HEAT SINK.
A device or space that absorbs heat from another device and allows that heat to dissipate.

IODINE.
A chemical element that is found naturally in salts and seawater and is used by the thyroid gland in the human body.

MELTDOWN.
The melting of superheated nuclear fuel in a nuclear reactor, usually the result of a loss of power or failure of cooling systems and accompanied by the release of radioactive substances.

NUCLEAR REACTOR.
The core of a nuclear power plant, in which nuclear reactions are sustained in a controlled manner.

RADIOACTIVE.
Producing a dangerous form of energy emitted in the form of waves or particles, known as radiation.

SPENT FUEL POOL.
A pool of circulating water used for storing and cooling used nuclear fuel.

TSUNAMI.
A very large ocean wave typically caused by an undersea earthquake or landslide.


FINDINGS

In view of the estimated exposure levels, an increased risk of cancer is the potential health effect of greatest relevance. The relationship between radiation exposure and lifetime risk of cancer is complex and varies depending on several factors, mainly radiation dose, age at time of exposure, sex and cancer site. These factors can influence the uncertainty in projecting radiation risks, in particular when assessing risks at low doses.

Outside the geographical areas most affected by radiation, even in locations within Fukushima prefecture, the predicted risks remain low and no observable increases in cancer above natural variation in baseline rates are anticipated.

Some health effects of radiation, termed deterministic effects, are known to occur only after certain radiation dose levels are exceeded. The radiation doses in Fukushima prefecture were well below such levels and therefore such effects are not expected to occur in the general population.

The estimated dose levels in Fukushima prefecture were also too low to affect fetal development or outcome of pregnancy and no increases, as a result of antenatal radiation exposure, in spontaneous abortion, miscarriage, perinatal mortality, congenital defects or cognitive impairment are anticipated.

In the two most affected locations of Fukushima prefecture, the preliminary estimated radiation effective doses for the first year ranged from 12 to 25 mSv. In the highest dose location, the estimated additional lifetime risks for the development of leukaemia, breast cancer, thyroid cancer and all solid cancers over baseline rates are likely to represent an upper bound of the risk as methodological options were consciously chosen to avoid underestimation of risks. For leukaemia, the lifetime risks are predicted to increase by up to around 7% over baseline cancer rates in males exposed as infants; for breast cancer, the estimated lifetime risks increase by up to around 6% over baseline rates in females exposed as infants; for all solid cancers, the estimated lifetime risks increase by up to around 4% over baseline rates in females exposed as infants; and for thyroid cancer, the estimated lifetime risk increases by up to around 70% over baseline rates in females exposed as infants. These percentages represent estimated relative increases over the baseline rates and are not estimated absolute risks for developing such cancers. It is important to note that due to the low baseline rates of thyroid cancer, even a large relative increase represents a small absolute increase in risks. For example, the baseline lifetime risk of thyroid cancer for females is just three-quarters of one percent and the additional lifetime risk estimated in this assessment for a female infant exposed in the most affected location is one-half of one percent. These estimated increases presented above apply only to the most affected location of Fukushima prefecture. For the people in the second most affected location, the estimated additional lifetime cancer risks over baseline rates are approximately one-half of those in the highest dose location. The estimated risks are lower for people exposed as children and adults compared to infants.

In the next most exposed group of locations in Fukushima prefecture, where preliminary estimated radiation effective doses were 3 to 5 mSv, the increased lifetime estimates for cancer risks over baseline rates were approximately one-quarter to one-third of those for the people in the most affected geographical location.

Among Fukushima Daiichi nuclear power plant emergency workers, the lifetime risks for leukaemia, thyroid cancer and all solid cancers are estimated to be increased over base- line rates, based upon plausible radiation exposure scenarios. These scenarios and their corresponding estimated risks are detailed in the body of this report. A few emergency workers who inhaled significant quantities of radioactive iodine may develop non-cancer thyroid disorders.

SEE ALSO *Energy ; Energy Production for Industry ; Energy Technology ; International Atomic Energy Agency ; Nuclear Energy ; Nuclear Fission ; Nuclear Power Accident: Chernobyl ; Nuclear Power Accident: Three Mile Island ; Nuclear Power: Commercial Reactors ; Plutonium ; Power and Power Plants ; Radiation ; Uranium ; Utilities, Energy Sources and Transmission*

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Lochbaum, David, Edwin Lyman, Susan Q. Stranahan, and the Union of Concerned Scientists. *Fukushima: The Story of a Nuclear Disaster*. New York: New Press, 2014.

Mahaffey, James. *Atomic Accidents: A History of Nuclear Meltdowns and Disasters from the Ozark Mountains to Fukushima*. New York: Pegasus Books, 2014.

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King, Ritchie S. "The Post-Fukushima World." *I EEE Spectrum* 48, no. 11 (November 2011): 44–45. This article can be found online at http://spectrum.ieee.org/static/the-postfukushima-world (accessed July 26, 2015).

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Onishi, Norimitsu, and Martin Fackler. "Japan Held Nuclear Data, Leaving Evacuees in Peril." *New York Times* (August 9, 2011). This article can be found online at http://www.nytimes.com/2011/08/09/world/asia/09japan.html?pagewanted=all (accessed July 26, 2015).

关键词解释
可以对文中出现的重要专有词进行解释

Sidebar: Hide

WORDS TO KNOW

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SPENT FUEL POOL.
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TSUNAMI.
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文章末尾处
文章参考来源

BIBLIOGRAPHY

Books

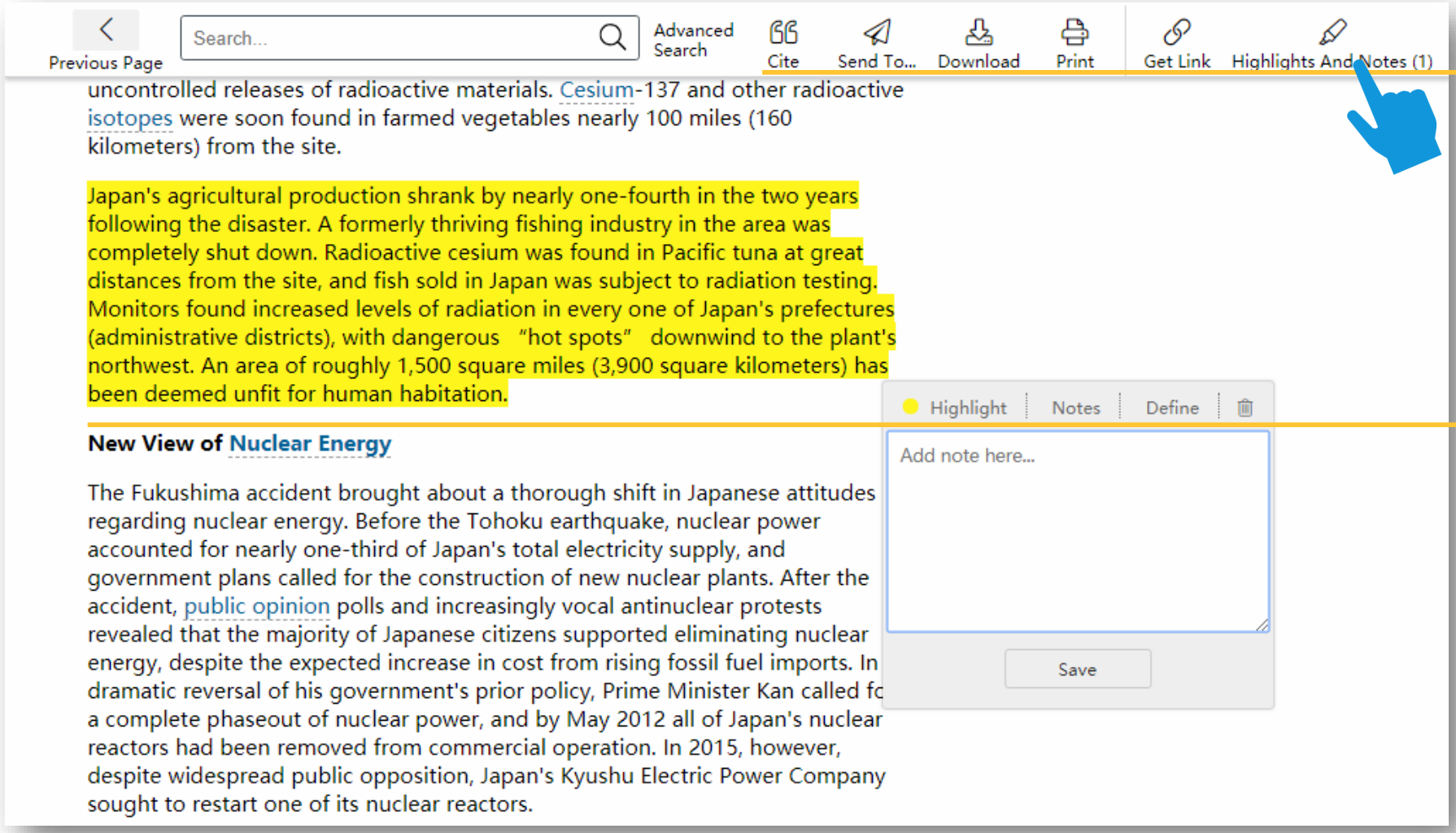
Lochbaum, David, Edwin Lyman, Susan Q. Stranahan, and the Union of Concerned Scientists. *Fukushima: The Story of a Nuclear Disaster*. New York: New Press, 2014.

Mahaffey, James. *Atomic Accidents: A History of Nuclear Meltdowns and Disasters from the Ozark Mountains to Fukushima*. New York: Pegasus Books, 2014.

Useful tools 功能展示

全文翻译
可方便快速理解文章大意，提高阅读效率，翻译仅提供一定的参考

Useful tools 功能展示



固定工具条
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标注/笔记/词典

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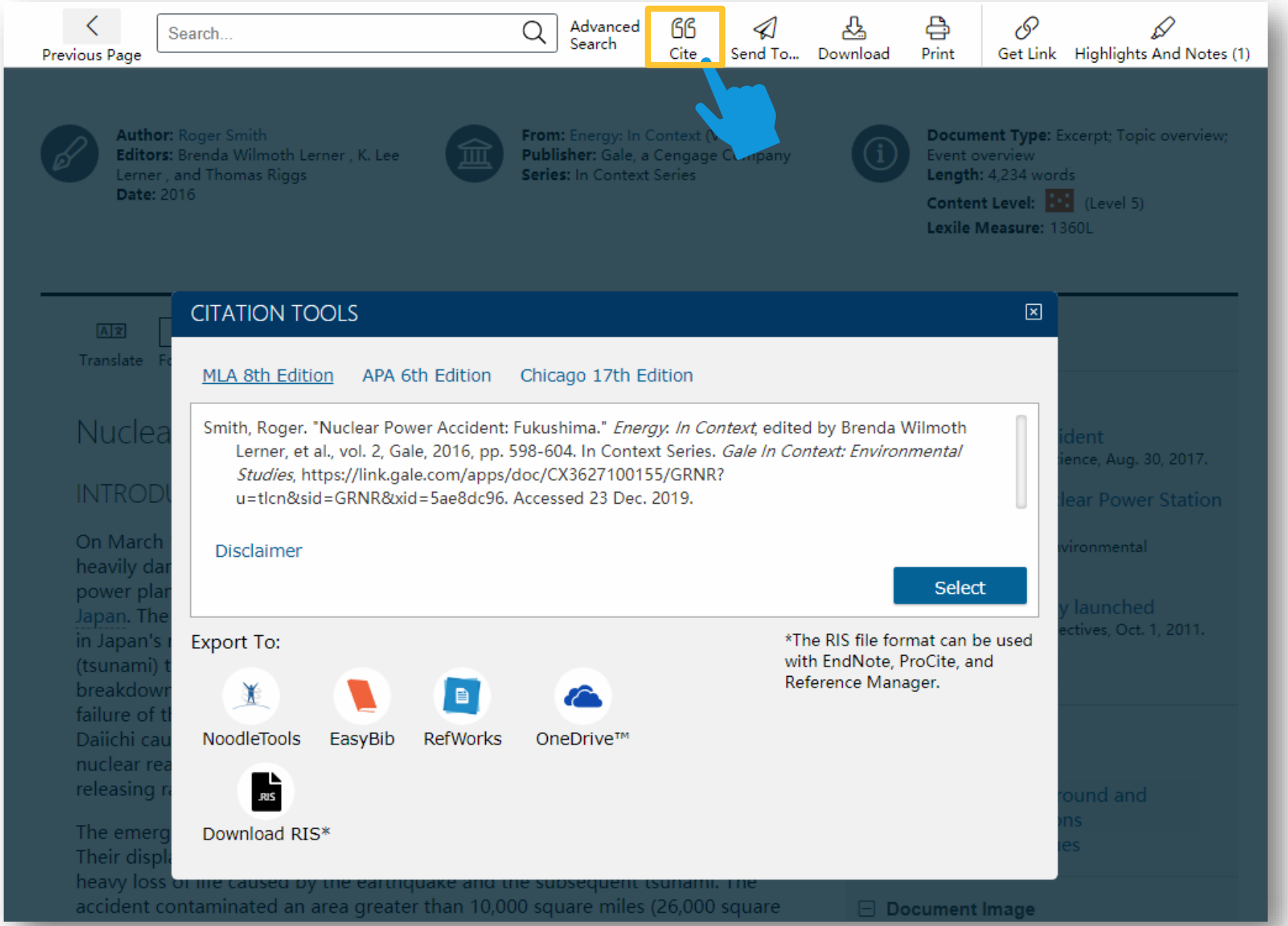
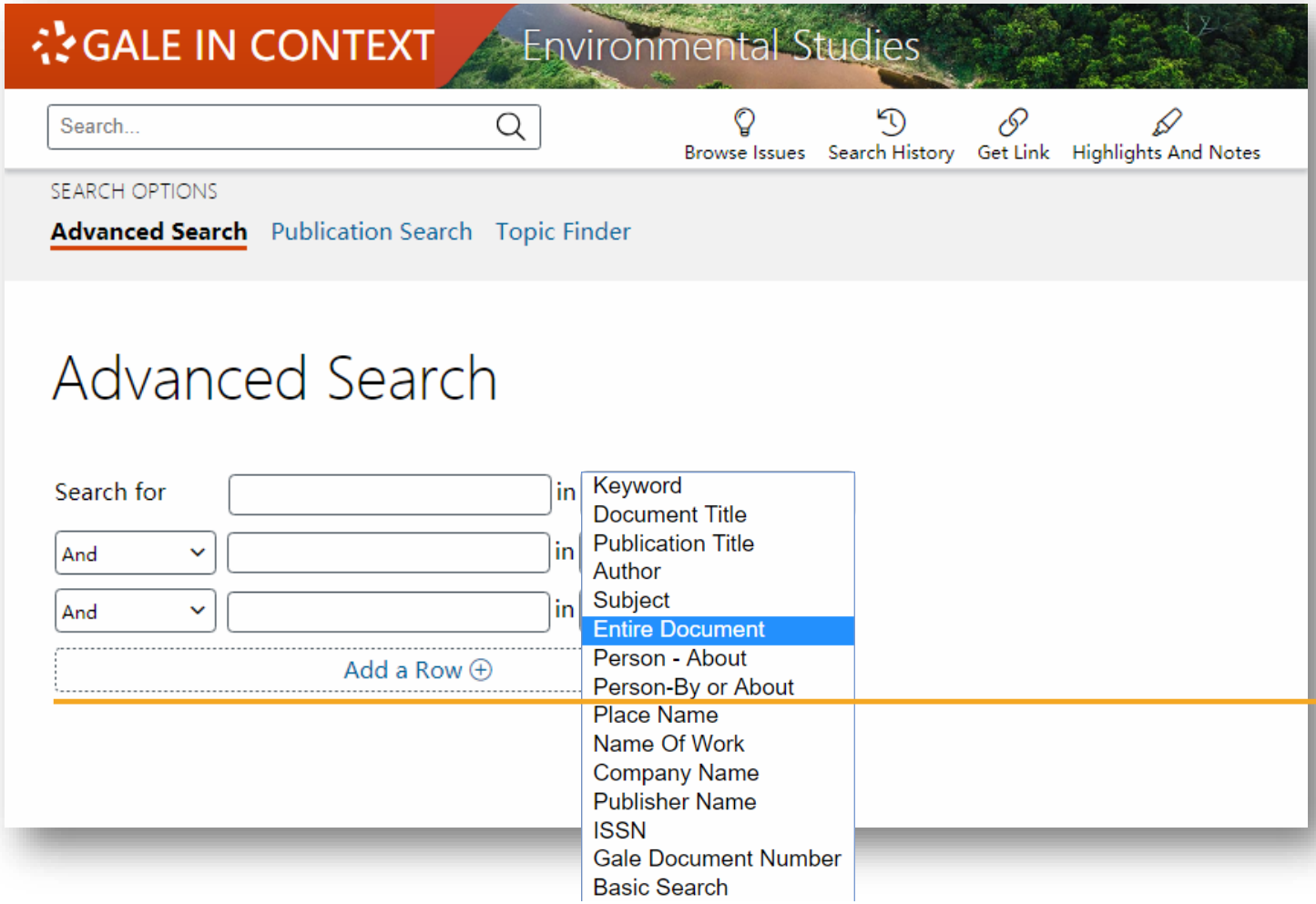


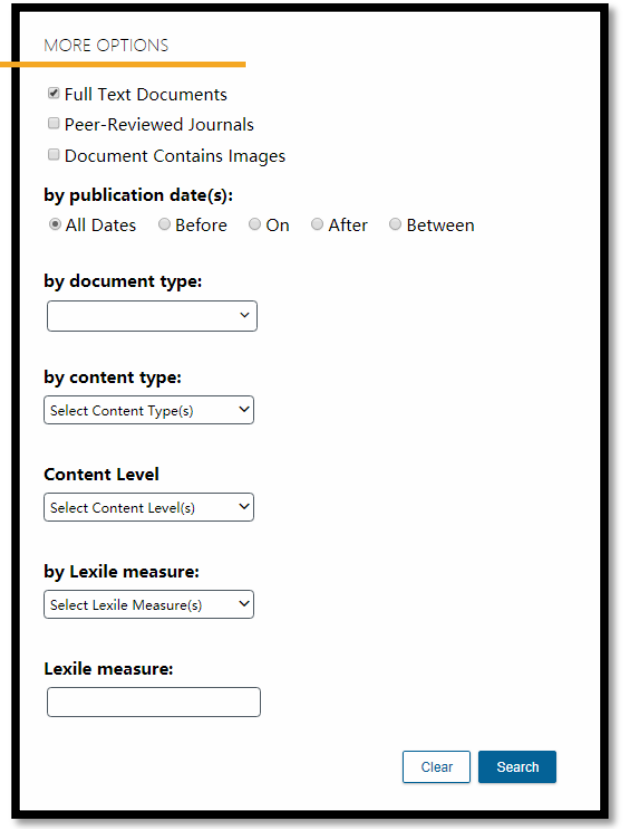
引用

三种常用引文格式
可以导出至其他引用工具中

Advanced Search 高级检索

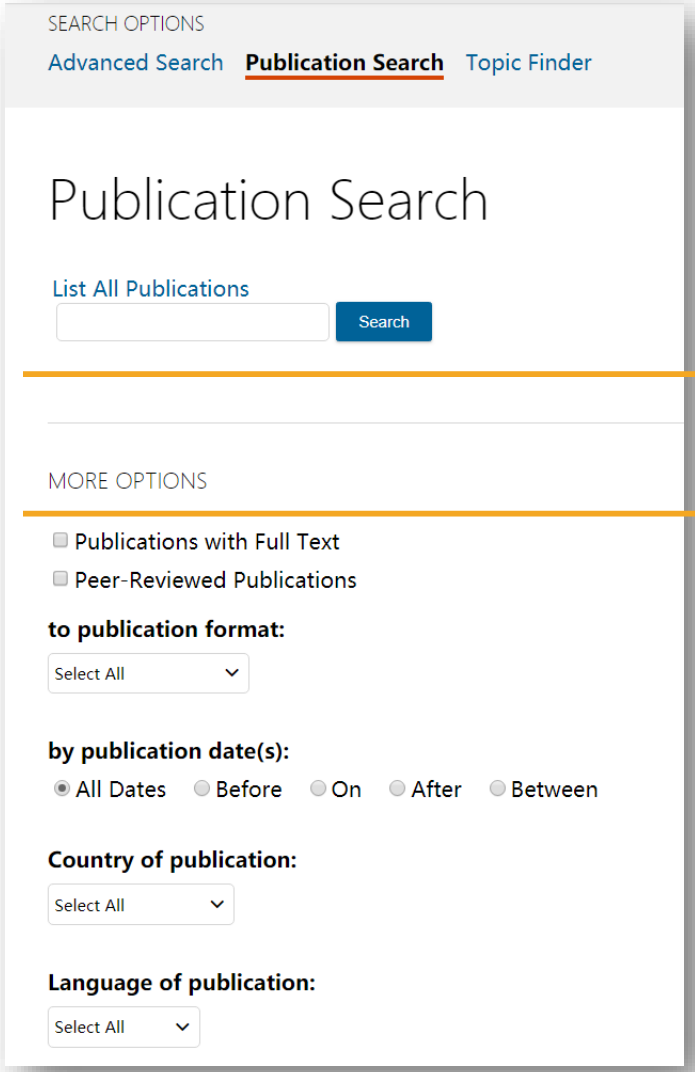


筛选条件：
包含全文的文档
同行评审期刊
包含图片的文档
按出版时间
按文档类型
内容类型等



检索主题
可增加检索关键词
可选择不同关键词检索类型

Publication Search 出版物导航



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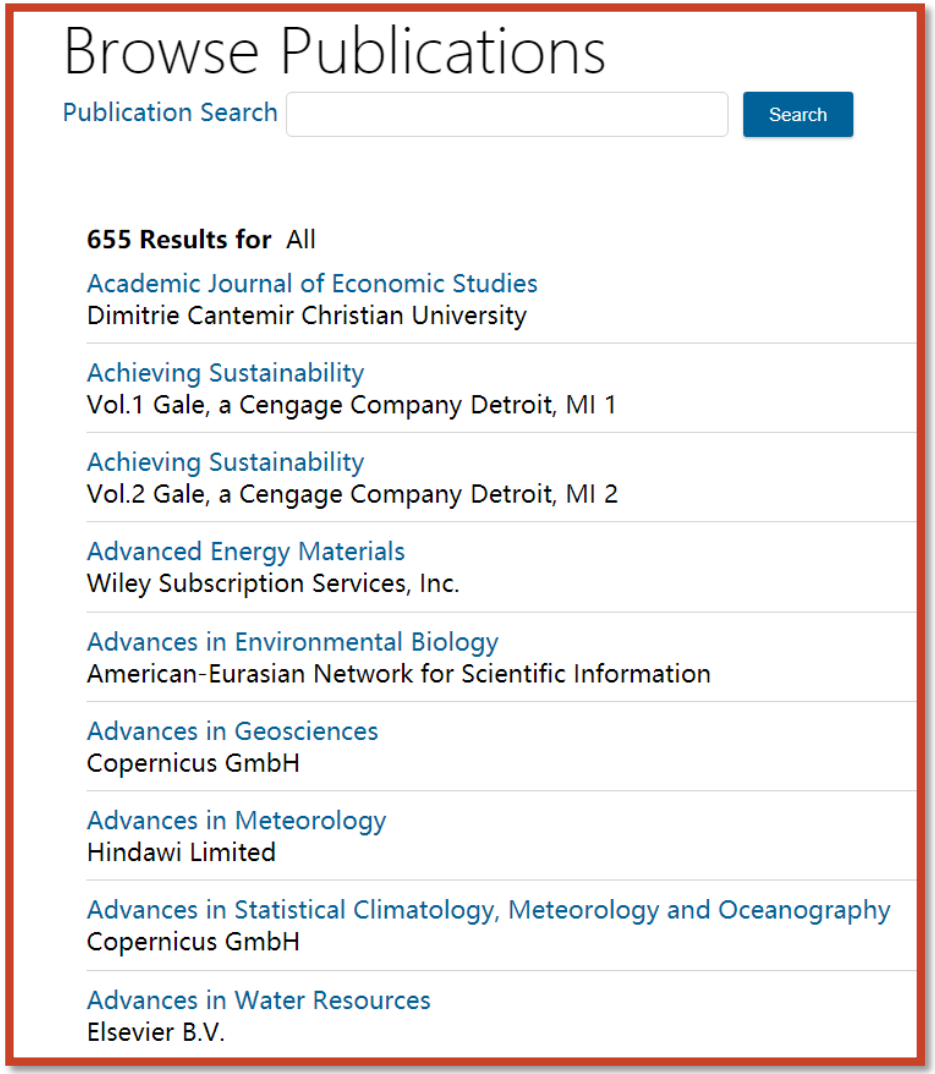
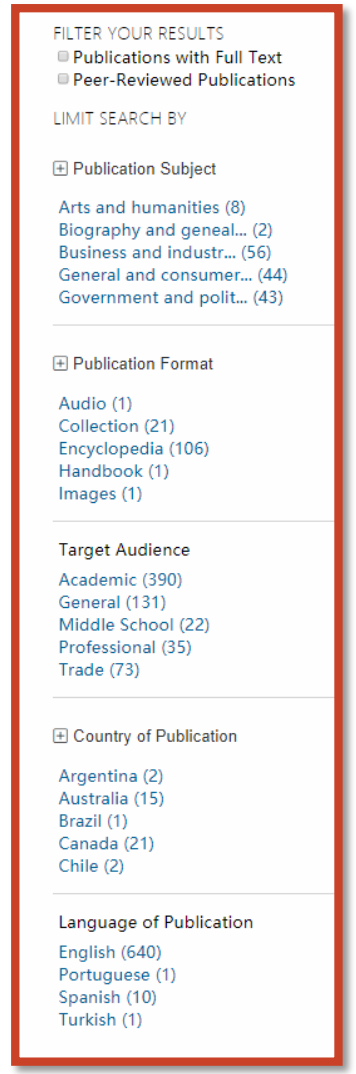
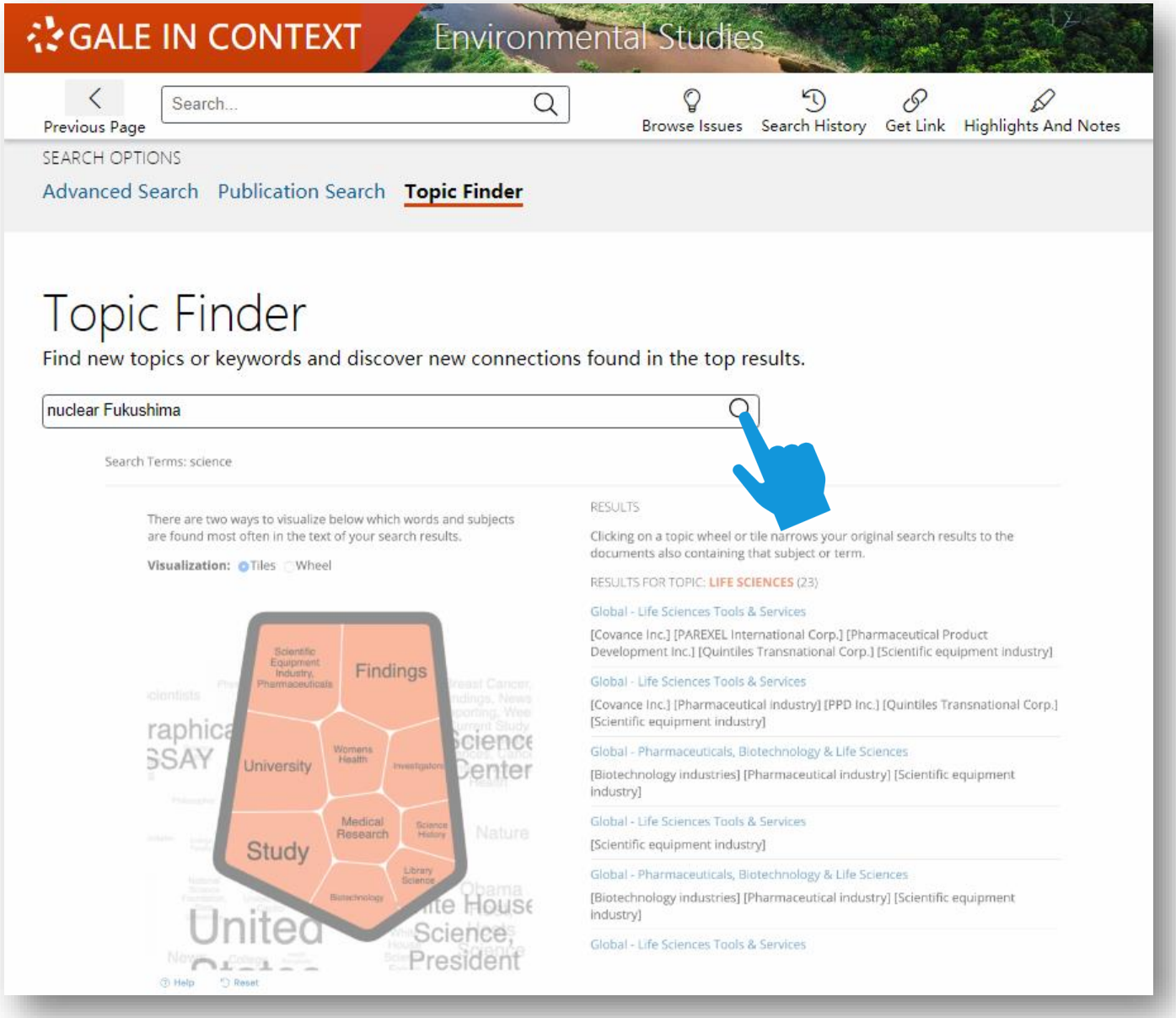
按出版时间
按出版国别
按出版语言



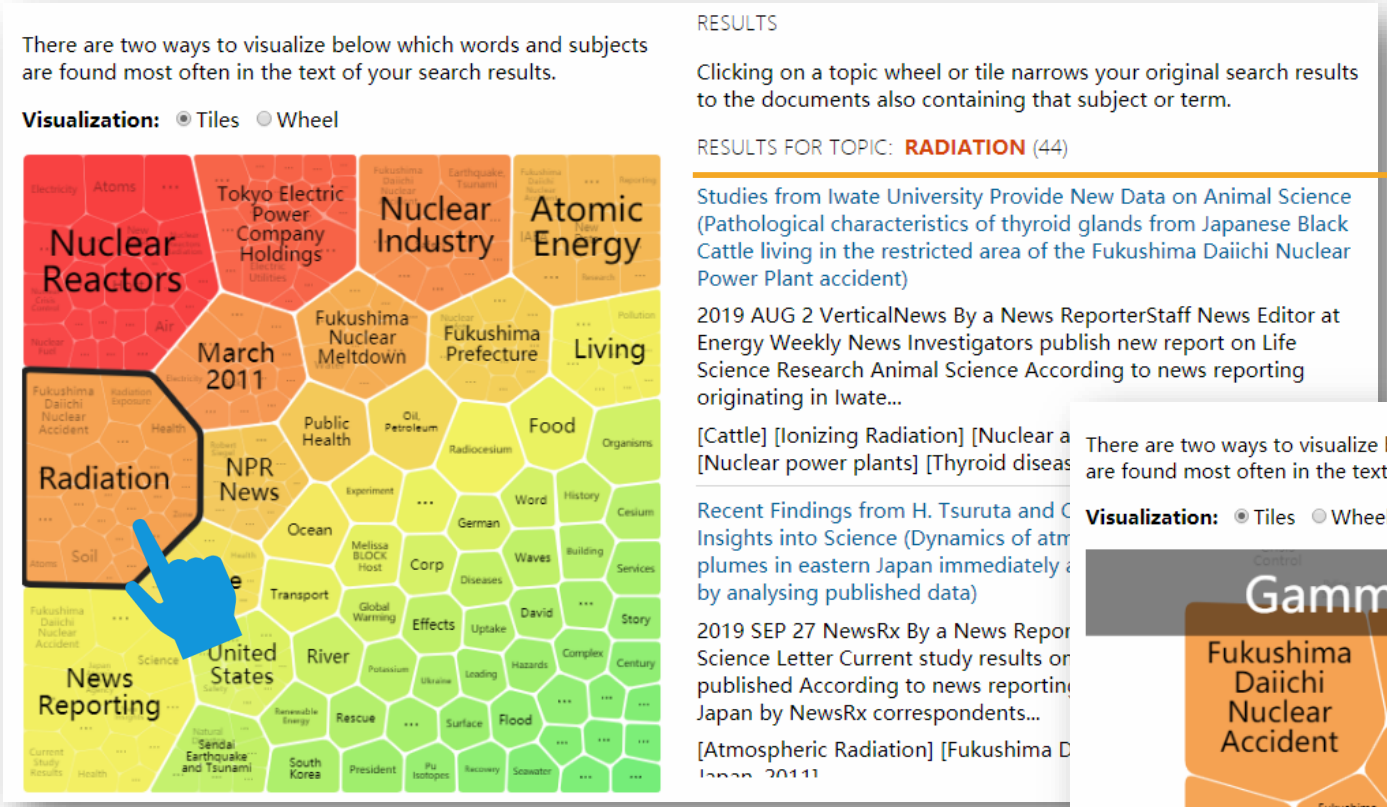


Topic Finder 主题查找器

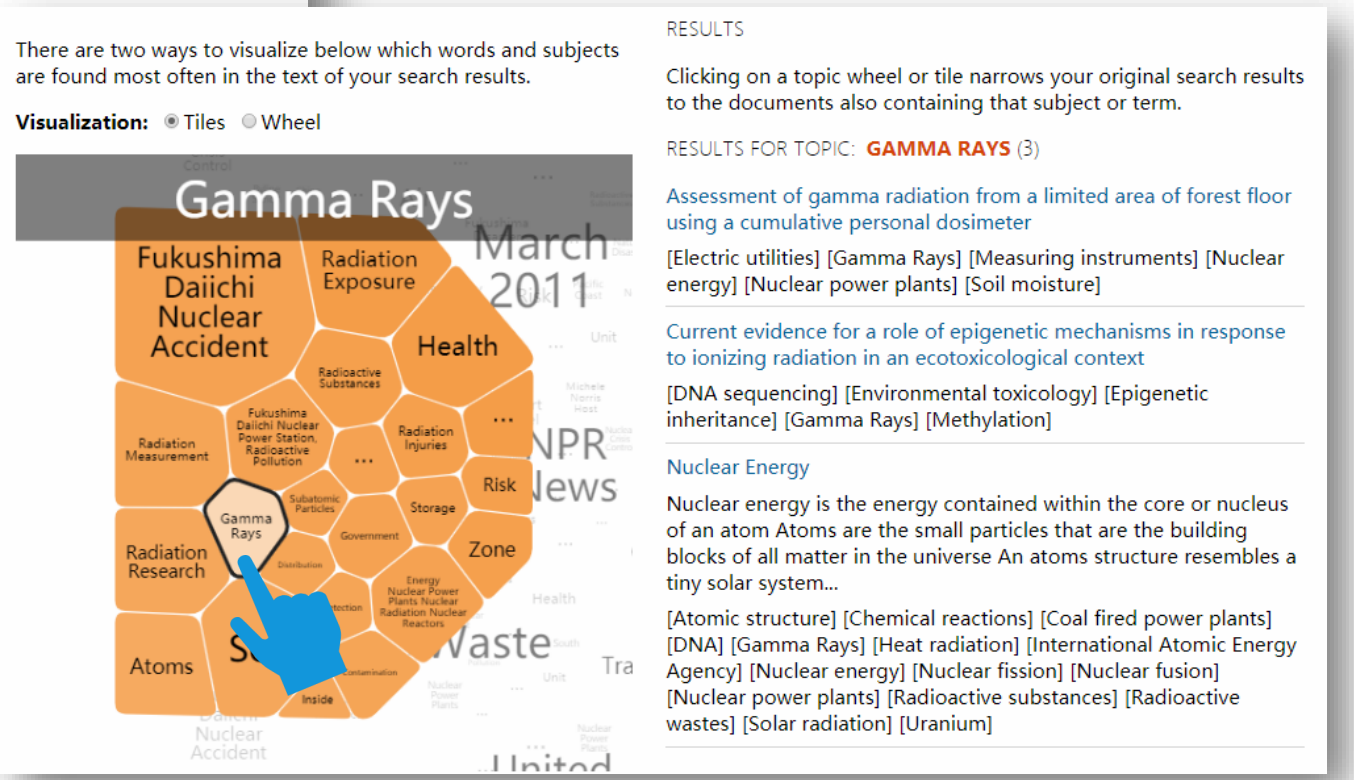


根据输入结果智能抽取标题、主题，并从顶部结果的子集中提取大约前 100 个词，然后将其纳入到算法。图形中显示的关键字是使用检索词在文稿中找到的最常见字词。右侧结果区可显示关键词在文献中搜索到的相关文章。

Topic Finder 主题查找器



主题结果可以根据点选，实时反馈相关文章
部分主题下还包括次级主题



Topic Finder 主题查找器

Topic Finder

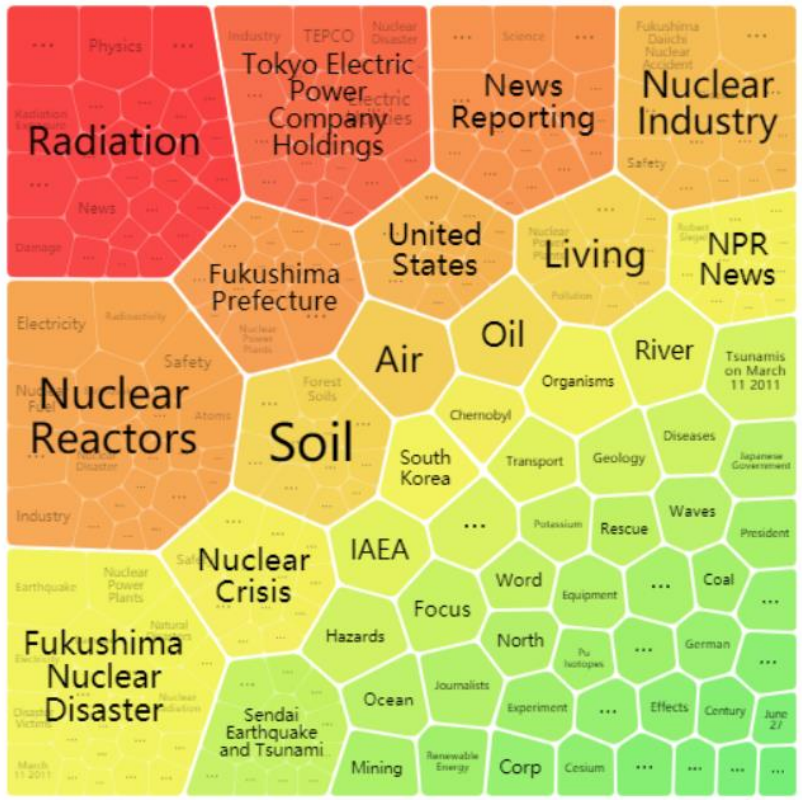
Find new topics or keywords and discover new connections found in the top results.

nuclear Fukushima

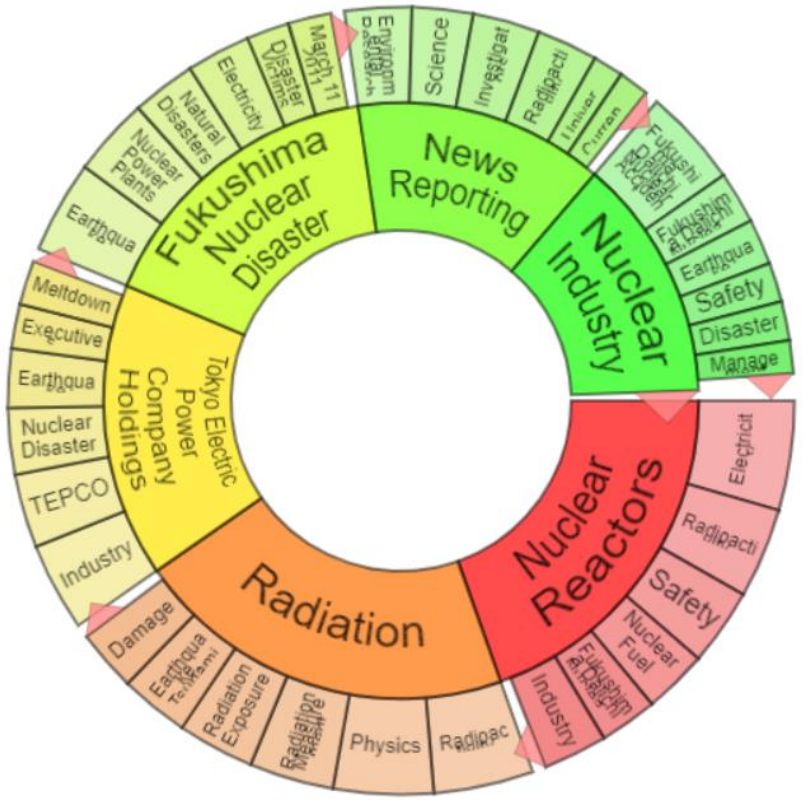
Search Terms: nuclear Fukushima

两种可视化图形

Visualization: Tiles Wheel



Visualization: Tiles Wheel



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