

# 国内外の動物園と博物館の 気候変動・環境教育における事例

特定非営利活動法人 EnVision環境保全事務所  
工藤知美



# 特定非営利活動法人 EnVision環境保全事務所

**Environment + Vision**

- 野生生物の調査・研究
- 情報公開の推進
- 政策提言
- 環境教育・普及啓発
- 国際協力

## 工藤知美



Churchill, Canada

国際協力・保全研究



札幌市 円山動物園

環境教育・普及啓発



California, United States

GIS研修(アメリカ)

# Table of contents

01. アシニボイン・パーク動物園（カナダ）
02. カリフォルニア科学アカデミー（アメリカ）
03. サンディエゴ動物園（アメリカ）



# Assiniboine Park Zoo

アシニボイン・パーク動物園



📍 カナダ マニトバ州 ウィニペグ



# Assiniboine Park Zoo



@ Churchill, Canada

# 氷と地域の関係性の説明

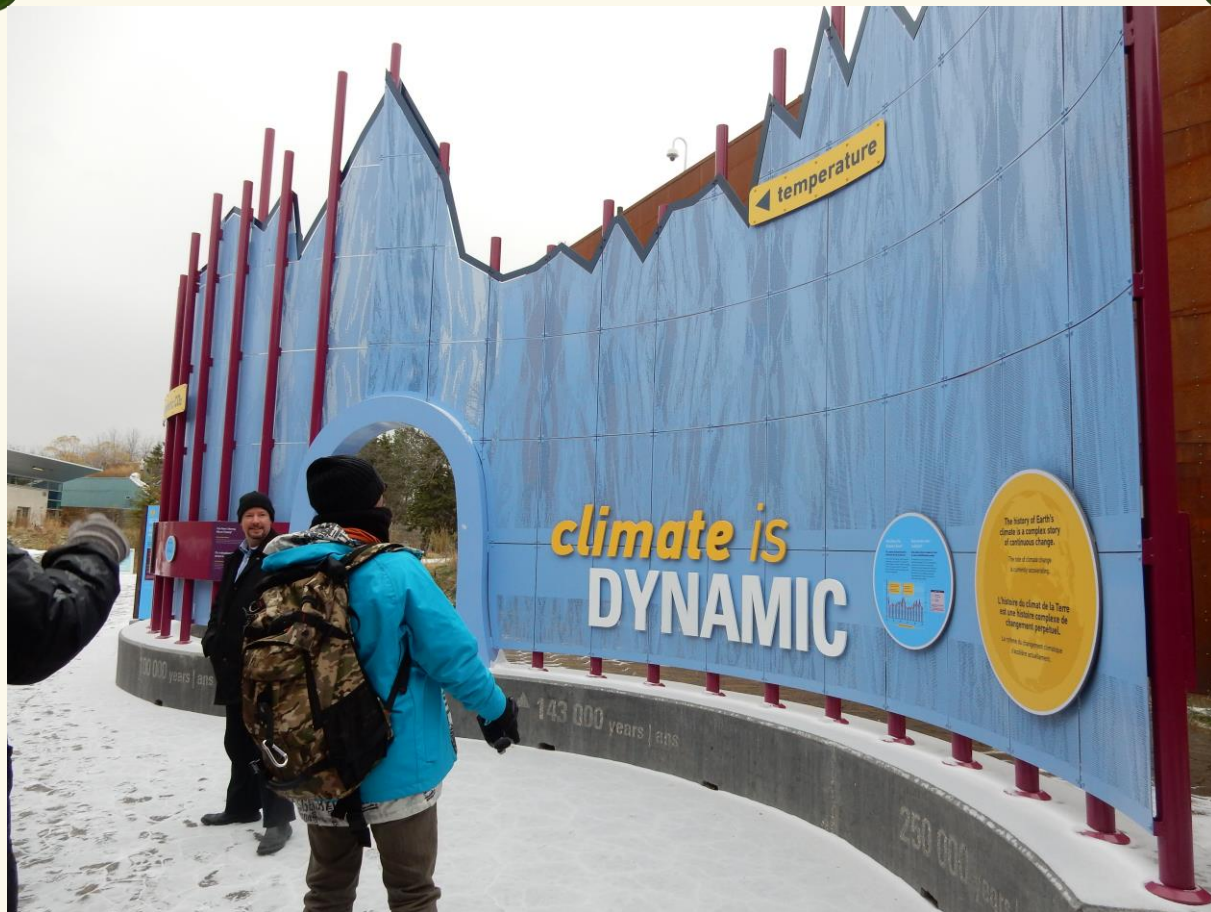


↑施設内の通路上に氷の様子を表す展示



氷が溶けることによって  
地域住民の生活に変化が生じる説明→

# 気温の変化を表した展示



気温グラフをインパクトの大きい展示で表現し、変化が一目で分かるような工夫

# ホッキョクグマ保全に関する情報



Leatherdale International Polar Bear Conservation Centre

ホッキョクグマの生息環境・生態・地域住民との関係・研究内容など



# ホッキョクグマの脅威に関する情報



“Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice and rising global average sea level.”

—Intergovernmental Panel on Climate Change Synthesis Report 2007

脅威の大きな要因として「気候変動」が取り上げられ、何が問題なのかを記載

# 問題を解決するには！？

## Solutions

## Solutions

### Step Up! | Approchez!

#### Make a Change for Polar Bears!

Spin the wheel to see how you can  
keep polar bears on top.

Here are some ways to reduce  
your impact on the environment.

#### Vous pouvez changer les choses pour l'ours blanc!

Faites tourner la roue pour découvrir comment  
vous pouvez aider l'ours blanc.

Voici quelques trucs pour réduire votre impact sur  
l'environnement.

Photo: David Johnson, David Johnson

Photo: David Johnson, David Johnson



#### At Work Au travail

- ✓ **Power Down**  
Turn off computers and other equipment when you leave.
- ✓ **Double Up**  
Reuse and recycle paper and other office supplies.
- ✓ **Stay Grounded**  
Instead of flying to meetings, try calls, webcasts/webinars, or using the train or bus.
- ✓ **Get Involved**  
Volunteer as a group for environmental activities like cleaning up litter or planting trees.
- ✓ **On Verne**  
Éteignez les ordinateurs et les autres équipements à la fin de la journée.
- ✓ **D'une pierre deux coups**  
Réutiliser et recycler le papier et les autres fournitures de bureau.
- ✓ **Les pieds sur terre**  
Plutôt que de prendre l'avion pour des réunions, utilisez le téléphone et la vidéoconférence ou prenez le train ou l'autobus.
- ✓ **Mobilisation**  
Participez bénévolement en groupe à des activités écologiques, comme des courses de nettoyage ou la plantation d'arbres.

「自分たちにできる行動」を詳細に記載

## ex) 学校でできること

### At School À l'école

- 
- ✓ **Pack It In**  
Bring your lunch and drinks in reusable containers
  - ✓ **Get Eco-Active**  
Participate in school-sponsored environmental programs or clubs
  - ✓ **Be Green**  
Use environmentally friendly school supplies
  - ✓ **Dig It**  
Plant trees or a garden on school grounds and compost food waste
  - ✓ **Boîte à lunch**  
Apportez vos aliments et vos boissons dans des contenants réutilisables
  - ✓ **Soyez écoactifs**  
Participez à des programmes ou à des groupes parrainés par l'école
  - ✓ **Soyez écologiques**  
Utilisez des fournitures sans danger pour l'environnement
  - ✓ **Retour à la terre**  
Plantez des arbres ou un jardin à l'école et compostez les déchets de cuisine

## ex) お店でできること

### At the Store Au magasin

- 
- ✓ **Fill Your Own**  
Carry reusable bags and use refillable bottles for water and other liquids
  - ✓ **Buy Locally**  
Choose locally produced food and other products
  - ✓ **Bulk Up**  
Reduce packaging by buying in bulk
  - ✓ **Read the Label**  
Choose environmentally friendly products that are locally produced, made with recycled materials or organically grown
  - ✓ **Réutilisez**  
Apportez vos sacs réutilisables et vos bouteilles à remplissages multiples pour l'eau et les autres liquides
  - ✓ **Achetez localement**  
Choisissez des aliments et d'autres produits locaux
  - ✓ **Achetez en vrac**  
Réduisez l'emballage en faisant des achats en vrac
  - ✓ **Lisez les étiquettes**  
Choisissez des produits écologiques locaux faits de matériaux recyclés ou cultivés biologiquement

# 子どもも楽しみながら学べる展示

**Our program's strict international protocols**  
**Notre programme de transition doit respecter des protocoles internationaux stricts.**

We will only transfer polar bears to facilities that meet or exceed the Manitoba Standard. This standard was created with input from Assiniboine Park Zoo and includes some of the most rigorous regulations yet developed.

**The Fine Print**

The Province of Manitoba will continue to own all polar bears. Qualified facilities will sign their agreement with the province.

Manitoba Conservation will evaluate facilities based on veterinary care, behavioural enrichment, educational programming, and staff training.

**ours de notre programme de transition doivent respecter des protocoles internationaux stricts.**

Nous transférons des ours blancs uniquement aux établissements qui respectent ou dépassent la norme du Manitoba, qui a été élaborée avec le concours du zoo du parc Assiniboine et comprend certains des règlements les plus rigoureux établis à ce jour.

**Jusque dans les moindres détails**

Le Manitoba demeure le propriétaire de tous les ours blancs. Les établissements qualifiés signent leur accord avec le gouvernement.

Conservation Manitoba évalue les établissements en fonction des soins vétérinaires, de l'enrichissement comportemental, de la programmation éducative et de la formation du personnel.

**Dehby 1668-2008**  
1668-2008

**Our History with Polar Bears**

At Assiniboine Park Zoo, Polar Bears have been a part of the story since 1928.

Our first polar bears came from Winnipeg conservationist Dehby and his wife. They were purchased by M&S after the closure of the Canadian Circus. Dehby came from the Hudson Bay in 1943. In 1956, Dehby was transferred to the provincial park, to work on the other side of the line. He died in 2008.

**Notre histoire avec les ours blancs**

Les ours de notre Assiniboine ont toujours été une partie de l'histoire depuis 1928.

Nous avons nos premiers ours blancs à Winnipeg, ont été les conservateurs de Dehby et sa femme. Ils ont été achetés par M&S après la fermeture du cirque canadien. Dehby vient du Nord du Manitoba. En 1943, Dehby est transféré dans un autre parc provincial, pour travailler de l'autre côté de la ligne. Il meurt en 2008.

**Help the Young Polar Bear Find a Home**

**Orphaned cub rescued**  
Un ourson orphelin sauvé

**Cub old enough to handle his own**  
L'ours est assez grand pour son camp seul

**Check cub's health**  
Vérifier la santé de l'ours

**Cub housed at CECOC**  
L'ours est en entassement au CECOC

**Orphan bear is transferred to an approved facility**

**Aide l'ourson blanc à trouver un chez-soi**

**Orphaned cub rescued**  
Un ourson orphelin sauvé

**Cub old enough to handle his own**  
L'ours est assez grand pour son camp seul

**Check cub's health**  
Vérifier la santé de l'ours

**Cub housed at CECOC**  
L'ours est en entassement au CECOC

**Orphan bear is transferred to an approved facility**

親からはぐれた子グマを発見した場合の保全プロセス

# California Academy Of Sciences

カリフォルニア科学アカデミー



アメリカ カリフォルニア州 サンフランシスコ



# 気候変動による海のサンゴ礁への影響



## Coral View

### Colorful Invertebrates

Coral reefs are the apartment buildings of the ocean. More organisms make their homes in coral-created reefs than in any other marine ecosystem. Climate change puts reef-building corals under serious stress. But there is good news: These ecosystems can rebound if we work to protect corals. By conserving these important marine invertebrates, we also sustain the vast webs of life that depend on them.



Temperature

Acidity



## Underwater Colors

The colors look far more vibrant in the deep ocean. Wavelengths of light that penetrate the shallowest reefs reach depths of 100 meters. Beyond that, longer waves of light are absorbed, leaving only the shorter wavelengths of blue and green light.



## Sea Change

Deep in the ocean, some colors disappear

Take a dive alongside a red fish. What happens to its color as you swim down from the water's surface? Wavelengths of light with lower energies—the reds and oranges—can't travel very far in water. Because these colors of light are lost at greater depths, red animals living in the deep sea fade into the dark background—and may be less visible to predators or prey.



## Colorful tropical reefs are changing

Coral reefs are the apartment buildings of the ocean. More organisms make their homes in coral-created reefs than in any other marine ecosystem. Climate change puts reef-building corals under serious stress. But there is good news: These ecosystems can rebound if we work to protect corals. By conserving these important marine invertebrates, we also sustain the vast webs of life that depend on them.

# 学びを体感できる施設

## Naturalist Center

Wise up. Get answers. Touch specimens. Browse books. Play games.



# より学びを体感できる施設



標本や本など、自由に手に取って学ぶことができる



# より学びを体感できる施設



パズル・粘土・塗り絵などを通して楽しく学べるスペース

# 屋上緑化施設“Living Roof”



建物の一部が気候変動対策を考慮した作り。来園者が自由に訪問することができる。

# Living Roof

## Birds of a Feather

### An inviting habitat



© Bob Ward

**Red-tailed hawk**  
*Buteo jamaicensis*  
Help control small mammal populations and play an important role in local ecosystems.



© Steve Green

**Black phoebe**  
*Sayornis nigricans*  
Wag their tail when perched, then fly out to catch an insect and return to the perch.



© George W. Schwaner III © CAS

**European starling**  
*Sturnus vulgaris*  
Nonnative. Their ability to adapt to many habitats has allowed their worldwide dispersal.



© Robert Hoover © CAS

**Brewer's blackbird**  
*Euphagus cyanocephalus*  
Forage in shallow water or fields for seeds, insects, berries and sometimes catch insects in flight.



© Barbara Schwaner

**Common raven**  
*Corvus corax*  
Opportunistic feeders, they eat carrion, insects, grains, berries, fruit, small animals, and food tossed into the trash.



© Bob Ward

**Lesser goldfinch**  
*Spinus psaltria*  
Feed on tree buds and weed seeds, but also eat dirt (geophagy) to obtain essential nutrients from the soil.



© Bob Ward

**Dark-eyed junco**  
*Junco hyemalis*  
Forage on the ground for insects and seeds.



© Steve Green

**White-crowned sparrow**  
*Zonotrichia leucophrys*  
Eat seeds, buds, grass and fruits. In spring they also eat insects.



© George W. Schwaner III © CAS

**Western gull**  
*Larus occidentalis*  
Their numbers dropped in the 1800s when their eggs were taken to feed the growing city of San Francisco, but now they are the most common gulls in the area.



© David Green Hayes © CAS

**California gull**  
*Larus californicus*  
Recently removed from protected status lists after these gulls began breeding in coastal areas like south San Francisco Bay and their numbers rebounded.

観察することができる鳥や昆虫、植物についての説明サイン

# 気候変動対策を考慮した建物



**Living Roof**

## 土

- ・15cmの土が天然断熱材
- ・雨水を吸収
- ・在来植物や野鳥の生息



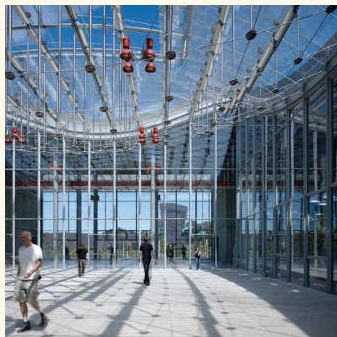
**Heating and Cooling**

## 空調

- ・空気を取り込む仕組みで建物を冷却
- ・熱気を逃がす

## 床暖房

- ・温水チューブ
- ・エネルギー需要年間10%削減



**Natural Light**

## 特殊ガラス

- ・熱吸収率を少なく
- ・冷房エネルギーを抑える



**Renewable Energy**

## ソーラーキャノピー

- ・約6万個の太陽光セルを設置
- ・年間約21万3,000kWhを供給

# カリフォルニア科学アカデミーのWebSite



CALIFORNIA  
ACADEMY OF  
SCIENCES

Visit

Exhibits & Events

Learn & Explore

Tickets

Join

Donate

About Us

Support



About Us

## Sustainability in Action

Mission: Regeneration

Strategic Initiatives

Vision & Values

Leadership

Careers & Paid Internships

Sustainability in Action

Diversity, Equity, Inclusion, & Access

サステナビリティの実践

# カリフォルニア科学アカデミーのWebSite



## Green Building & Operations

Our building is an exhibit in itself. Explore the sustainable engineering that earned us our first LEED Platinum rating—and the efficient daily operations that scored us our second.



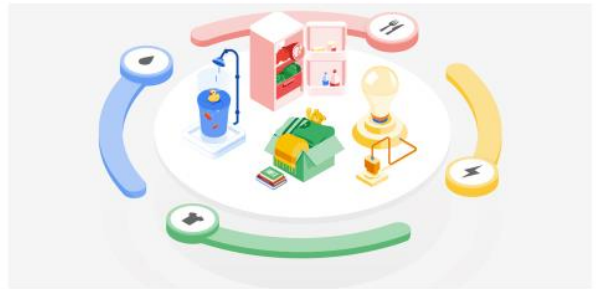
## Breeding Programs

Some of the Academy's most exotic animals are actually San Francisco natives. Learn how our breeding programs help improve genetic diversity and inform more effective conservation strategies.



## Sustainability Success Stories

Environmental victories often have their roots in Academy research. Explore how our scientists are making waves in coral reef restoration, shark conservation, and citizen science.



## Your Plan, Your Planet

Sustainability meets delightfulness with Your Plan, Your Planet, a surprisingly fun, ingeniously interactive new tool developed by Google and the Academy. Explore it on your smartphone for the best experience.

# Search Results

climate change

x "climate change"

## Resource Type

- Activities
- eBooks
- Field Trips
- Games
- Guides
- Handouts
- Interactive
- Lesson Plans
- News
- Online Programs
- Other
- Podcasts
- Professional Learning
- Resource Collections
- Videos

- Live Online Programs
- Classroom Strategies
- Professional Learning
- Resource Collections

## Grades

- Preschool
- Kindergarten
- 1st Grade
- 2nd Grade
- 3rd Grade
- 4th Grade
- 5th Grade
- Middle School

About 230 results (0.30 seconds)

About 230 results (0.30 seconds)



Lesson Plan | Global **Climate Change** and Sea Level Rise

Rise

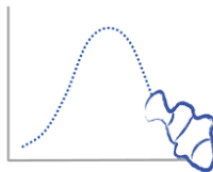
California Academy of Sciences > global-climate-change-and-sea-level-rise

Global **Climate Change** and Sea Level Rise ... Do sea levels rise when ice melts? Does it matter whether the ice is on land or in the ocean? Students design a ...

## Video: Coral Reefs and **Climate Change** | Flipside Science

California Academy of Sciences > educators > coral-reefs-and-climate-change

The California Academy of Sciences' Science News Team brings you this two-part report on scientists studying the impacts of warming temperatures on corals and ...



## Video: How Does **Climate Change** Affect Biodiversity? | Biodiversity ...

California Academy of Sciences > how-does-climate-change-affect-biodiversity

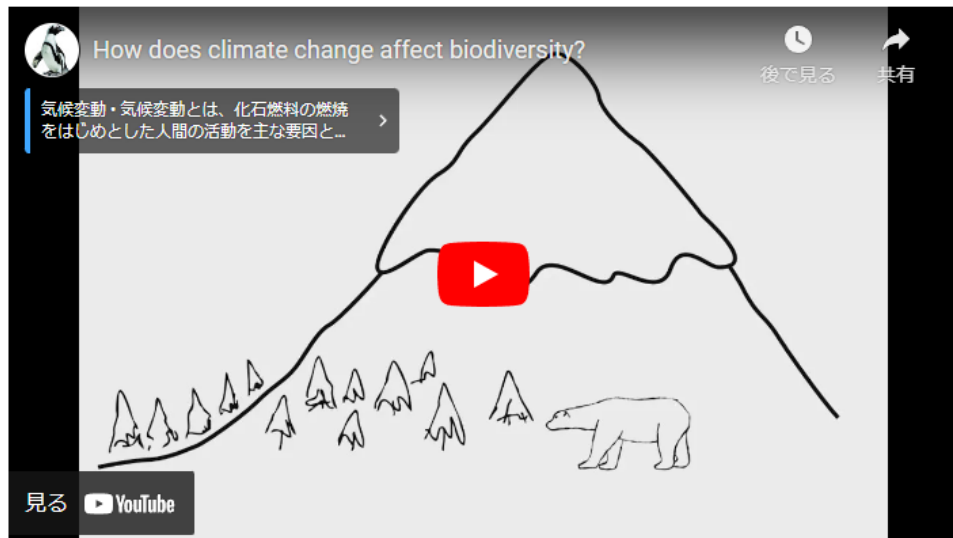
As human activities warm the Earth, biodiversity levels and distributions



climate change

DIY Science

# How Does Climate Change Affect Biodiversity?



## Share This

Share

Post

## Biodiversity Tutorials

Learn what biodiversity is, why it's important, and how it can be protected.

[View full collection](#)

## Partner Platforms

You can also view our Biodiversity Course on [Khan Academy](#), [YouTube](#), and [iTunes U](#).

Local impacts can have global consequences. Humans are causing accelerating changes in the atmosphere, on land, and in the oceans. Life in these changing environments is tough for many species.



# San Diego Zoo

サンディエゴ動物園



 アメリカ カリフォルニア州 サンディエゴ

# 遊びながら学べる展示



実物大サイズのゾウの首輪の模型



絶滅した動物のX線図

# 動物園ボランティアによる教育



ゾウの骨のレプリカを用いて仕組みを説明

# まとめ

## 「野生動物の保全」 「教育」

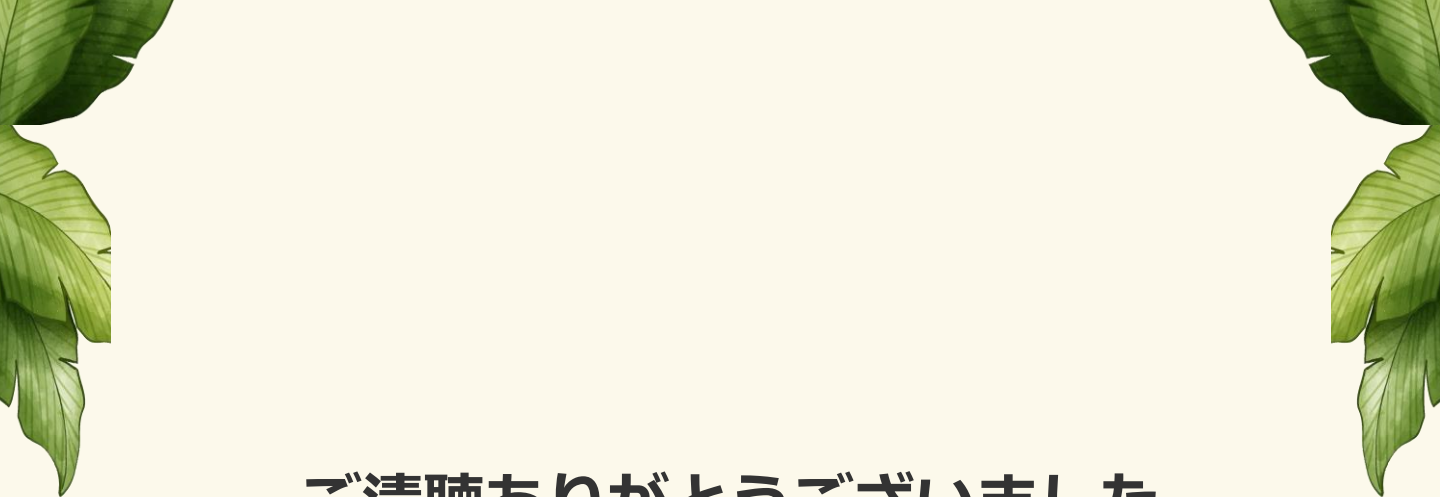
↓  
実現のために

### <専門家の配置>

- ・ キューレーター（学芸員）
- ・ 野生動物の研究者

### <資金確保>

- ・ ファウンドレイジング



ご清聴ありがとうございました

特定非営利活動法人 EnVision環境保全事務所  
工藤知美