



2024 APCC 기후정보 생산 및 활용 사용자 워크숍

APCC 기후서비스 플랫폼 소개 및 회원 가입

예측운영과
과장 이현록

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APCC 기후서비스 통합 플랫폼을 이해하고 회원 가입을 통한 플랫폼 서비스 활용 준비

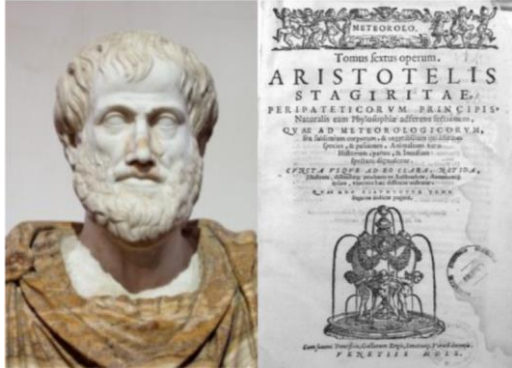
1 APCC 기후서비스 플랫폼 소개

- | 역사 속 기후정보
- | APCC 기후정보서비스
- | APCC 기후서비스 통합플랫폼

2 APCC 기후서비스 플랫폼 회원가입

- | 회원가입
- | 실습

| 과거



@Wikipedia

Aristoteles; B.C. 384-322
Meteorologica



@arkiv.certec.lth.se

Otto Von Guericke; 1602-1686



17세기

- 독일 게리케,
과학, 기압계(폭풍우)



@Wikipedia

Alexander Von Humboldt; 1769-1859

기원전

- 아리스토텔레스(기상학): 경험 저술

중세

- 점성술

18-19세기

- 독일 훔볼트
관측기록 기반 기상도 (예측X)
- 19세기 후반
관측기반 일기예보 시작

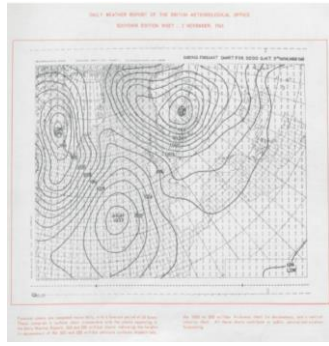
1 근대



@Met Office, Meteor (1959)



@Met Office, Comet (1965), The first operational NWP forecast



Apollo 11: The computers that put man on the moon (1969)

The so-called Apollo Guidance Computer (AGC) used a real time operating system, which enabled astronauts to enter simple commands by typing in pairs of nouns and verbs, to control the spacecraft. It was more basic than the electronics in modern toasters that have computer controlled stop/start/defrost buttons. It had approximately 64Kbyte of memory and operated at 0.043MHz. @ ComputerWeekly, July, 2009



기상관측 도구의 발명, 일기도 고안 및 통신기술 발달
→ 1800년대 중반 이후 일기도 기반 일일 예보 등 근대적 일기예보 체제 정착

20세기 컴퓨터 발명, 수치예보 이론 → 예측

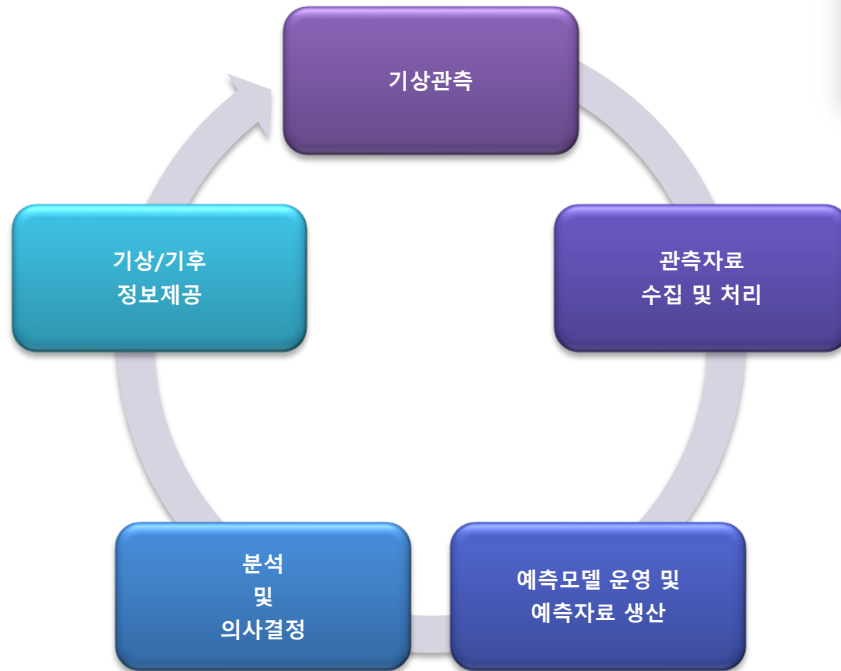
- 1904년: 노르웨이 기상학자 V. 비에르크네스 - 수치예보 가능성 이론 제안
- 1922년: 영국 L.F. 리처드슨 - 수작업 수치계산에 의한 일기예보 시도
- 1950년: 폰 노이만, C. A. 로즈비, G. J. 차니, A. 엘리야센 등 - 컴퓨터 활용 최초 수치예보
- 1954년: 스웨덴 기상청 - 세계 최초 수치예보를 기상업무에 도입
- 1957년: 미국, 일본 기상청 - 수치예보 시작



@Met Office, IBM 360/195 (1971)



@Met Office, An Interactive Monitor (1980s)



| 현재

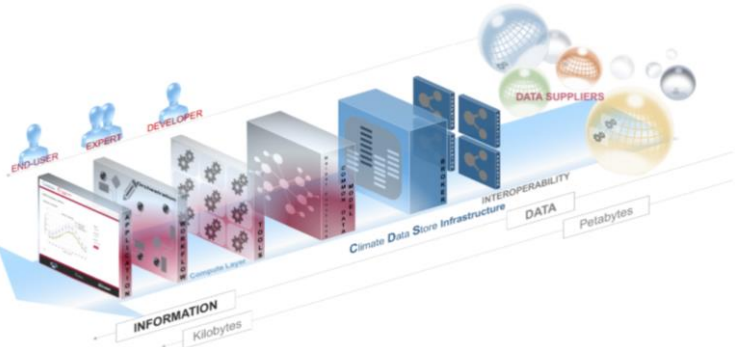
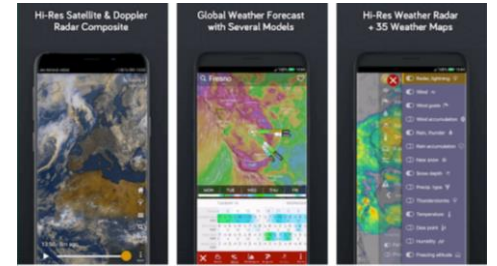


@Met Office, Cray T3E(2003) / Cray XC40 (2015~2017)

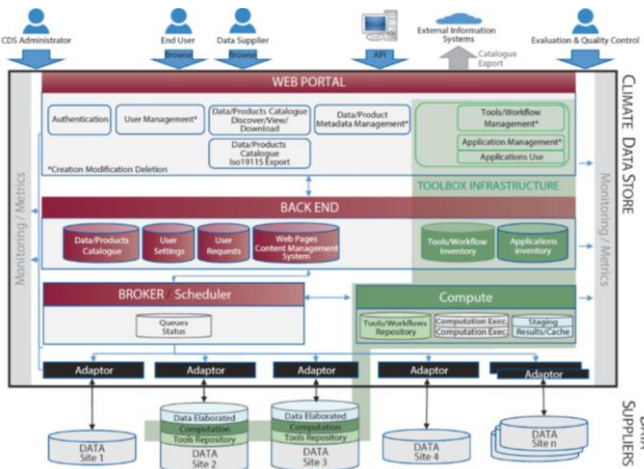
Your smartphone is **millions of times more powerful** than all of NASA's combined computing in 1969



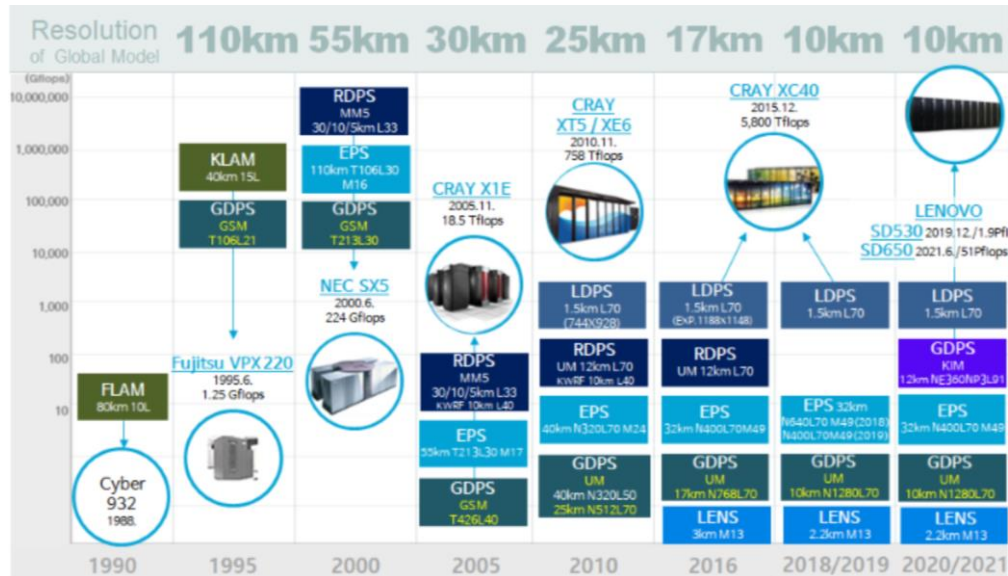
Climate and Weather APP for smartphone



@ECMWF CDS Architecture and Infrastructure



@국립기상슈퍼컴퓨터센터, 국가기상슈퍼컴 역사



국가기상슈퍼컴 5호기 개요

- 슈퍼컴퓨터란? 전 세계 컴퓨터 성능순위에서 500위 안에 드는 컴퓨터
- 슈퍼컴퓨터 연산단위: 1,000,000,000,000,000 (Exa Peta Tera Giga Mega Flops)
- 슈퍼컴 5호기 구성: 초기분 1기 두루루 1.9PF, 최종분 2기 그루의 마루 51PF (05.9PF x 2기)

TOP500 통재 국내 슈퍼컴퓨터

순위	연도	모델명	성능 (단위: PF)
1위	2021년 11월 기준	삼성전자 S80-21	25.2
2위	2021년 11월 기준	기상청 슈퍼컴 5호기 그루	18.0
3위	2021년 11월 기준	기상청 슈퍼컴 5호기 마루	18.0
4위	2021년 11월 기준	한국과학기술연구원 슈퍼컴 5호기 두루루	13.9
5위	2021년 11월 기준	기상청 슈퍼컴 4호기 두루루	2.4
6위	2021년 11월 기준	기상청 슈퍼컴 4호기 마루	2.4
7위	2021년 11월 기준	삼성전자 S80-21 스케일러 모듈	2.3
8위	2021년 11월 기준	슈퍼컴 5호기 구성	1.9

세계 슈퍼컴퓨터 3순위

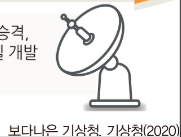
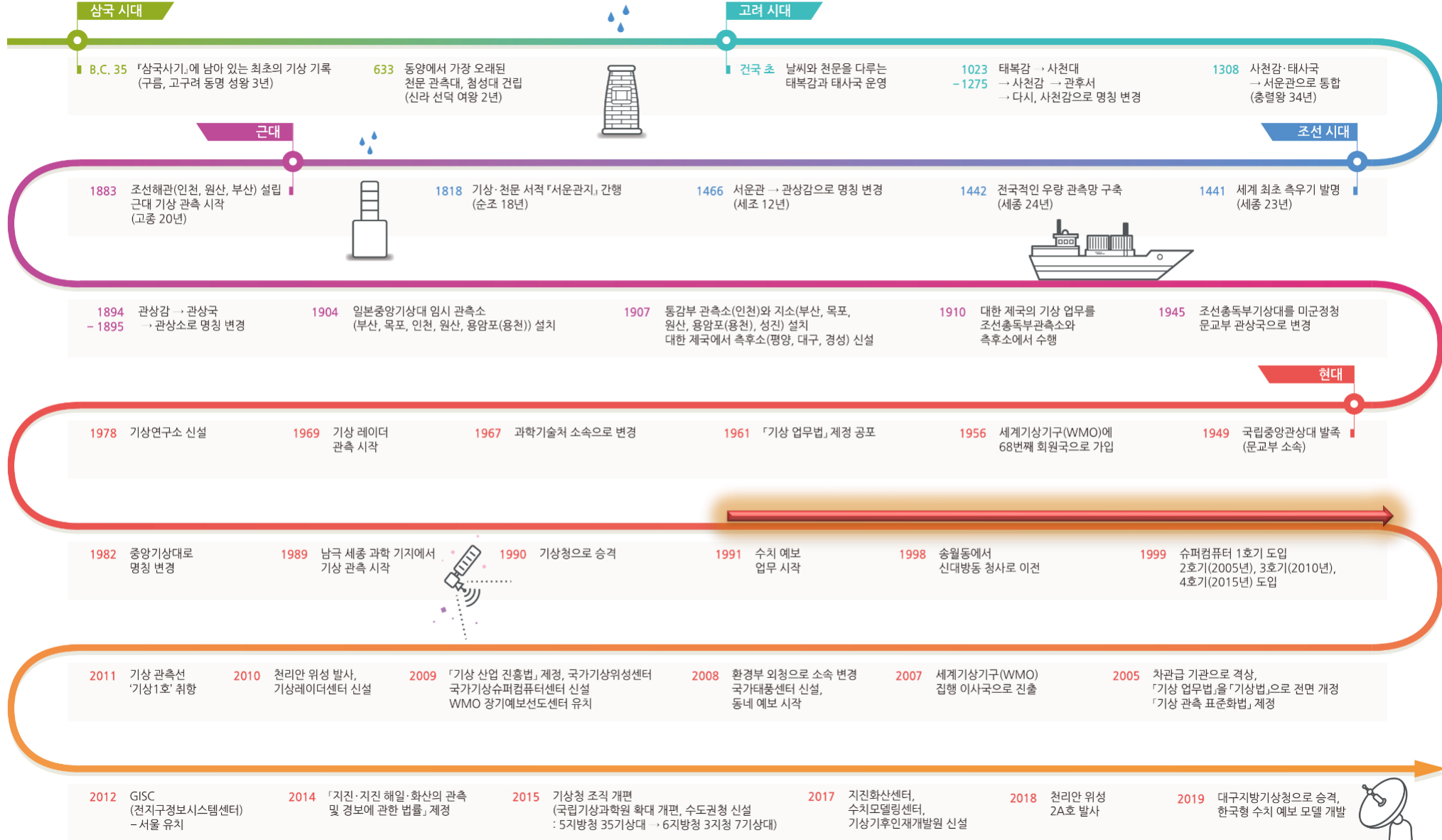
순위	연도	모델명	성능 (단위: PF)
1위	2021년 11월 기준	미국 Summit	148.8PF / 200.79PF
2위	2021년 11월 기준	일본 Fugaku	442.0PF / 537.21PF
3위	2021년 11월 기준	미국 Sierra	94.66PF / 125.71PF

주요국 슈퍼컴 보유 순위

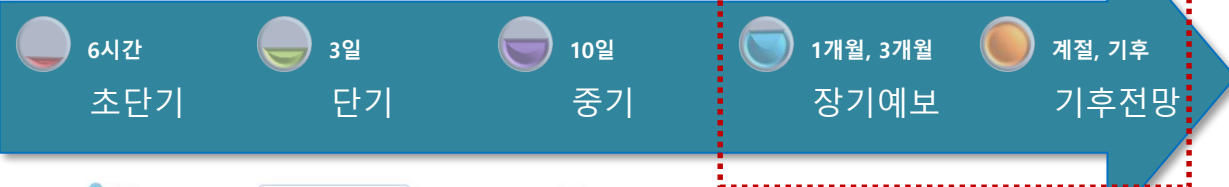
순위	국가	연도
1위	미국	226대
2위	중국	113대
3위	일본	29대
4위	한국	7대

| 국내

연혁

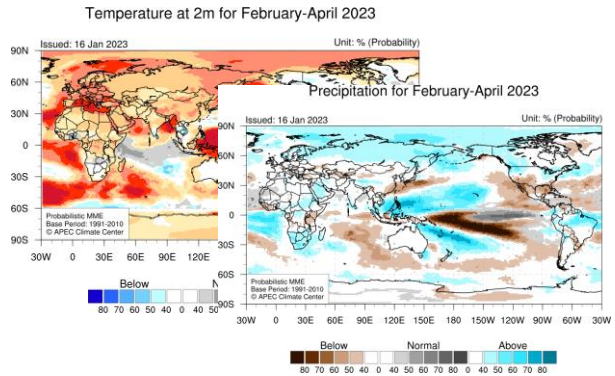


| APCC의 현재

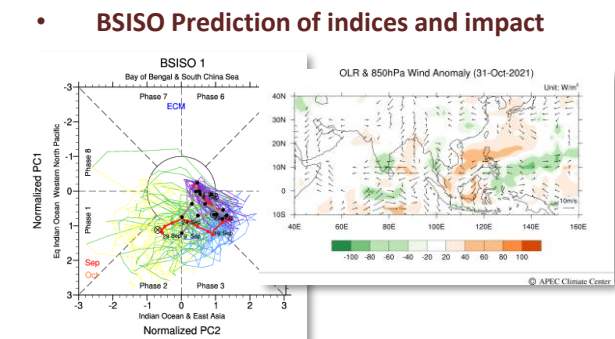


각 국의 고비용 기후예측정보들의 실시간 수집, 분석

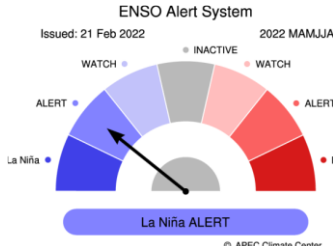
다중모델앙상블 (Multi-Model Ensemble) 기법 활용하여 기후예측정보 생산



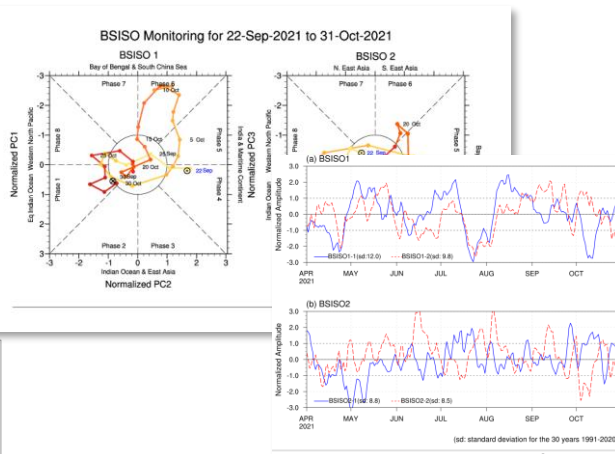
- 01 아태지역 이상기후 대응을 위한 기후예측정보 생산 및 공유
- 02 다양한 모델 결과의 통합, 재해석을 통한 예측성능 개선 및 불확실성 진단
- 03 예측정보 개선 및 활용성 강화를 위한 연구개발 및 온라인 서비스



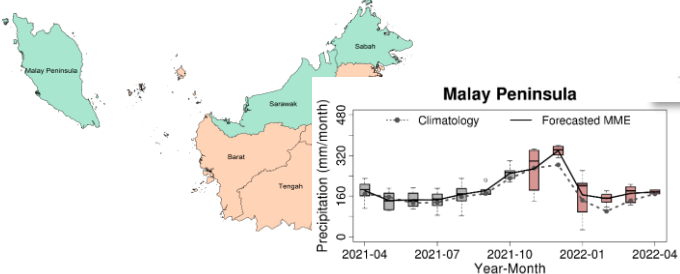
ENSO alert and other oceanic indices



BSISO Monitoring

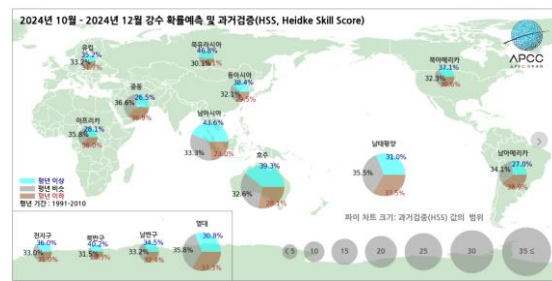
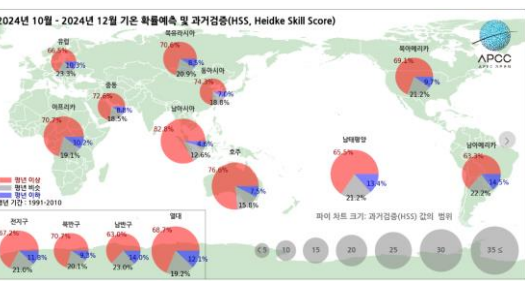


Fire early warning (Southeast Asia)



<http://www.apcc21.org>

기후예측정보 제공: 홈페이지



| APCC의 현재

기후예측 | 전지구 기후예측 기후전망

예측 기간: 2024년 | 10월 ~ 3월(+1년) | 기후전망 여카이브 >

전지구 MME 계절전망 (2024년 10월 ~ 2025년 3월)

2024년 9월 19일(목) 발표

2024년 10월 - 2024년 12월 기온 확률예측 및 과거검증(HSS, Heidke Skill Score)

지역	평년 이상 (%)	평년 하소 (%)	평년 이하 (%)
유럽	66.5%	23.3%	10.3%
북아메리카	70.8%	8.5%	20.9%
북아시아	74.3%	7.0%	18.8%
동아시아	70.8%	8.5%	20.9%
중동	72.8%	8.8%	18.5%
아프리카	70.7%	10.2%	19.1%
남아시아	82.8%	4.6%	12.6%
호주	76.6%	7.5%	15.6%
남태평양	65.5%	12.6%	21.2%
남아메리카	69.1%	8.7%	21.2%
남태평양	63.3%	14.5%	22.2%
전지구	67.2%	11.3%	21.0%
북반구	70.7%	9.3%	20.1%
남반구	63.6%	14.7%	23.0%
열대	66.7%	12.1%	19.2%

파이 차트 크기: 과거검증(HSS) 값의 범위 (5, 10, 15, 20, 25, 30, 35 ≤)

- APCC ENSO 경보는 '라니냐 주위 (La Niña Watch)'를 제시함. 2024년 11월에 -1°C 이하의 Niño3.4는 서서히 상승하여 2025년 3월에는 -0.4°C에 이를 것으로 전망됨. 예측 전 기간 동안 라니냐가 발생할 확률이 가장 우세할 것으로 예상됨.
- 2024년 10월-2025년 3월 동안 열대 및 아열대 중태평양, 적도 중앙 태평양을 제외한 전지구 대부분 지역의 기온은 평년보다 높을 확률이 매우 높 것으로 전망됨.
- 같은 기간 동안 적도 서태평양의 강수는 평년보다 적을 확률이 매우 높 것으로 예상됨.

기후예측 | 여름철 계절내진동 예측 정의

여름철 계절내진동 예측 정의

- APCC는 아시아 지역의 여름철 계절내진동 (BSISO, Boreal Summer Intraseasonal Oscillation) 지수의 감시 및 예측정보를 8월-10월의 기간 동안 매일 제공하고 있습니다.
- BSISO는 15-60일 주기로 적도 인도양에서 발생하여 점진적으로 동북진하며 아시아 지역의 여름 몬순과 대기 순환, 날씨에 영향을 주는 대규모 대류현상으로 몬순 시스템 단기 변동의 근본적인 현상인 강기와 우기에 영향을 주는 요인 중 하나입니다.
- BSISO 지수는 30-60일 주기를 가지고 북진하는 모드 BSISO1과 10-30일의 주기를 가지고 북서진하는 모드 BSISO2로 표현되며, 주요 대류활동 위치에 따라 각각 8개의 위상으로 분리할 수 있습니다. BSISO 지수에 대한 보다 자세한 설명은 Lee et al. (2013)을 참고하십시오.

BSISO

아래 그림은 BSISO 변동성을 살펴보기 위해 과거 30년 기간(1991-2020년) 동안 강한 BSISO가 발생한 경우에 대해 2개의 모드의 모의 결과와 관련된 주요 변수의 합성장을 나타낸 것이다. (단 강수의 경우 1997-2020년 자료를 사용하였음)

관심 기간: BSISO | 위상 | 변수

5월 | 10월 | BSISO1 | 전체 | 상향장파복사 & 850hPa 바람 | 추가

OLR & Wind at 850hPa | Unit:W/m²

BSISO1 PHASE1 MJJASO

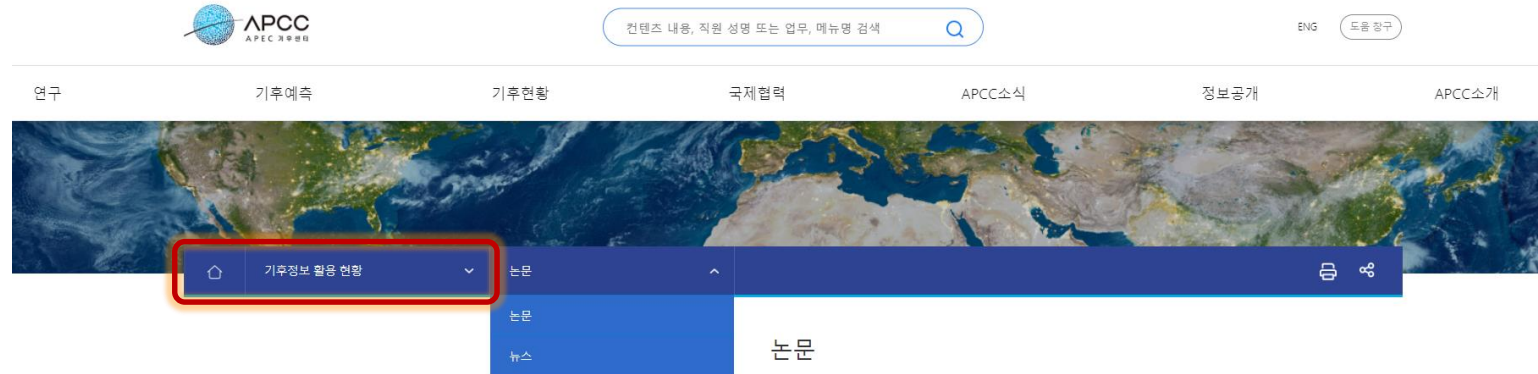
BSISO1 PHASE2 MJJASO

BSISO1 PHASE3 MJJASO

BSISO1 PHASE4 MJJASO

© APEC Climate Center

| APCC의 현재



아래와 같이 다양한 분야의 연구 및 기사에서 APCC의 기후정보가 활용되고 있습니다.
APCC가 제공하는 기후정보를 활용한 또 다른 연구 및 기사가 있으시면 apcc@apcc21.org로 연락주시기 바랍니다.

- > 2024년
 - Min, Y.-M., C.-M. Im, V. N. Kryjov, D. Jeong, 2024: Recent challenges in the APCC multi-model ensemble seasonal prediction: Hindcast period issue. *J. Geophys. Res.*, **129**, e2023JD039787, <https://doi.org/10.1029/2023JD039787>
- > 2023년
 - Kim, O.-Y., and C.-M. Lim, 2023: Predictability of the Western North Pacific Subtropical High and Associated East Asian Monsoon Rainfall in APCC Multi-Models. *J. Geophys. Res. Atmos.*, **128**, e2023JD038476, <https://doi.org/10.1029/2023JD038476>
 - Wang, F., L. Wang, T. Dai, and Y. Han, 2023: Interplay between Boreal Summer Intraseasonal Oscillation and Southern Hemisphere Stratospheric Polar Vortex Warming. *J. Climate*, **36**, 6839-6853, <https://doi.org/10.1175/JCLI-D-22-0786.1>
- > 2022년
 - Rhee, J. and B. Myoung, 2022: Objective and Probabilistic Long-Range Forecasts of Summertime Air Temperatures in South Korea Based on Gaussian Processes. *Wea. Forecasting*, **37**, 329-349.

| APCC의 현재

The screenshot shows the APCC website's navigation menu with '기후정보서비스' (Climate Information Services) highlighted in a red box. Below the menu, the '기후정보서비스' section is displayed, featuring a teal header with the text: 'APCC 기후센터는 사용자가 다양한 기후정보를 보다 효과적으로 활용할 수 있는 기후정보서비스를 운영하고 있습니다.' (APCC Climate Center is operating climate information services that allow users to utilize diverse climate information more effectively.)

The main content area is titled '기후정보서비스 통합 플랫폼' (Climate Information Services Integrated Platform) and includes a link to 'CLIK(CLIimate Information toolKit, https://cliks.apcc21.org)'. Below this, there are sections for '기후정보 제공 서비스' (Climate Information Provision Service) and '기후정보 생산 서비스' (Climate Information Production Service).

기후정보 제공 서비스
APCC 기후정보를 다양한 방법으로 내려받을 수 있습니다.

기후정보 생산 서비스
다양한 모델 조합을 통해 MME 예측정보와 지정별 상세화 예측정보를 사용자 맞춤형으로 생산할 수 있습니다. 또한 계절예측 및 기후변화 시나리오에 대한 통계적 상세화 및 평가 정보를



<https://cliks.apcc21.org>

The screenshot shows the CLIK website interface. A prominent notice is displayed: 'MME participation model change notification'. The notice includes the following information:

- The issue day of seasonal forecasts change:** Our seasonal forecasts are issued on the 15th of each month. In the case that the 15th falls on a weekend or national holiday, they are issued on the first workday after the 15th.
- Institute official name change:**
 - Change the institute name from CWS (Central Weather Bureau) to CWA (Central Weather Administration)
- Model update:**
 - Change ECCO model name from CarSP5v2.1 to CarSP5v3
 - Change CWA model name from TCW81v1.1 to TCW81v1.1
 - Change MGO model name from MGOAM-2 to MGOAM2.4

Please refer to the detailed description of the individual model [here](#).

Buttons for 'Don't show this notice for one day' and 'Close' are visible at the bottom of the notice.

1. APCC 기후서비스 플랫폼 소개 | APCC 기후정보서비스

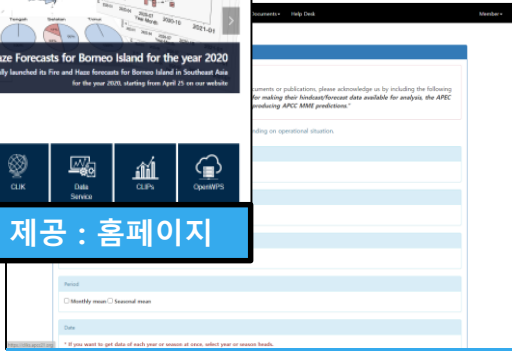
APCC 기후서비스 플랫폼 소개 및 회원가입

12

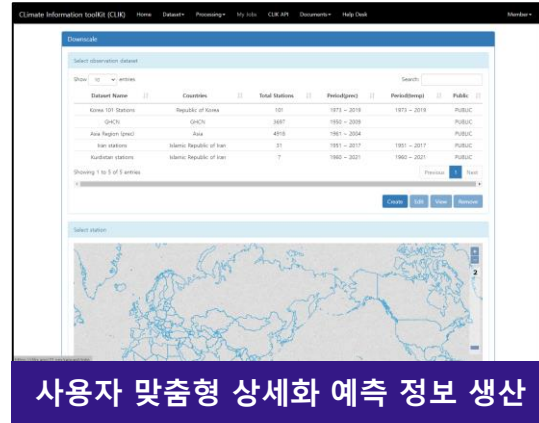
| APCC 기후정보서비스 (기후정보 제공/처리/생산)



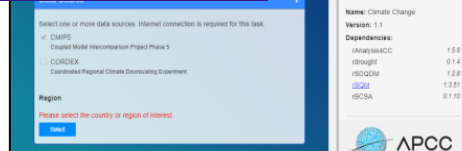
기후예측정보 제공 : 홈페이지



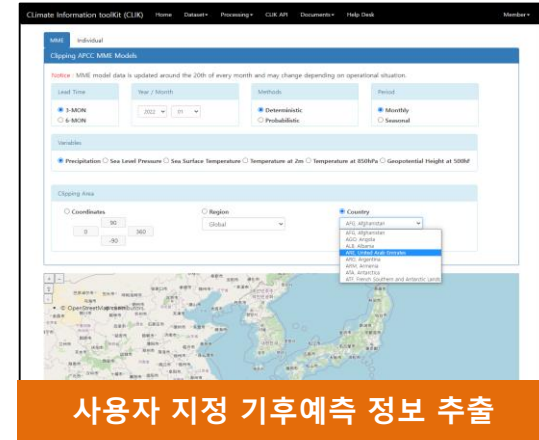
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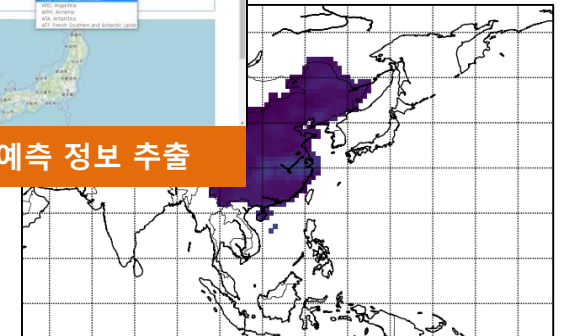
사용자 맞춤형 상세화 예측 정보 생산



통계적 상세화 정보 제공: AIMS



사용자 지정 기후예측 정보 추출



지리정보 기반 마스킹 정보 추출

기후예측정보 제공 서비스

- 홈페이지 예측정보 제공
 - 홈페이지를 통한 생산된 기후예측정보 제공
- Dataset download
 - APCC에서 생산/수집/가공된 기후정보를 디지털 형식으로 다운로드 받을 수 있는 서비스

기후예측정보 생산 서비스

- Downscale/Prediction/Verification
 - 다양한 모델 조합을 통한 MME 예측정보와 지점별 상세화 예측정보를 사용자 맞춤형으로 생산
- AIMS
 - 계절예측 및 기후변화 시나리오에 대한 통계적 상세화/평가 정보 생산

기후예측정보 처리 서비스

- Clipping
 - 사용자가 설정한 지역, 변수, 기간에 대해 필요한 자료만 추출하는 서비스
- Composite
 - 사용자가 선택한 기후자료에 대한 합성 서비스
- Masking
 - 정밀한 자료추출을 위한 지리정보 기반의 마스킹 정보를 제공하는 서비스

| 기후서비스

기후서비스 정의

| 개인 혹은 기관의 의사결정을 도와주기 위한 기후정보의 제공

Climate services provide climate information in a way that assists decision making by individuals and organizations. Such services require appropriate engagement along with an effective access mechanism and must respond to user needs.

Such services involve high-quality data from national and international databases on temperature, rainfall, wind, soil moisture and ocean conditions, as well as maps, risk and vulnerability analyses, assessments, and long-term projections and scenarios. Depending on the user's needs, these data and information products may be combined with non-meteorological data, such as agricultural production, health trends, population distributions in high-risk areas, road and infrastructure maps for the delivery of goods, and other socio-economic variables.

<https://www.wmo.int/gfcs/what-are-climate-weather-services>

| 플랫폼

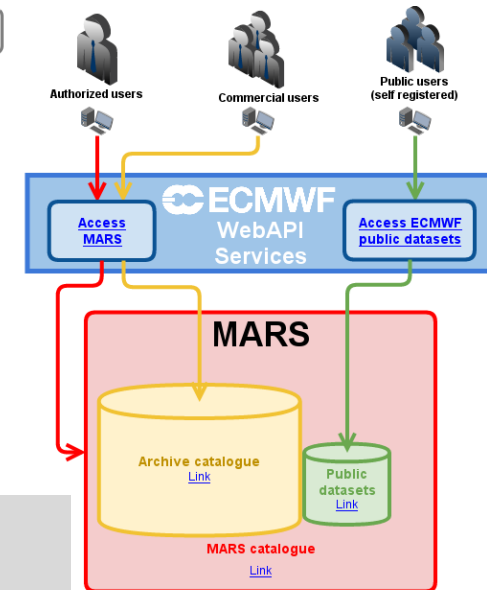
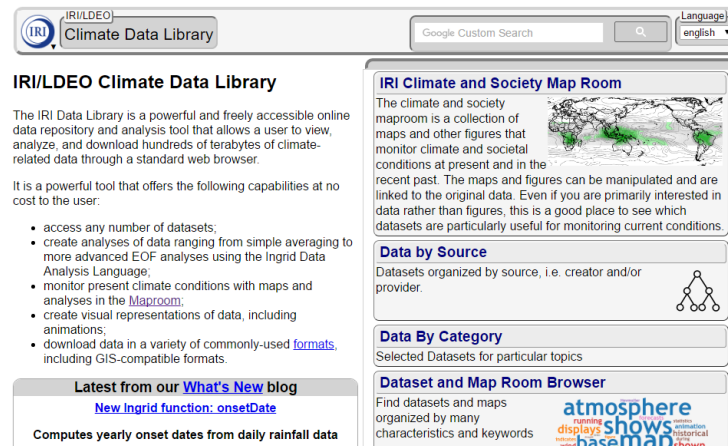
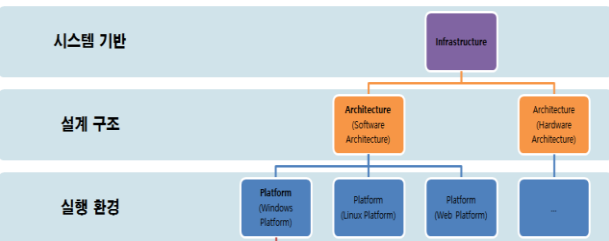
플랫폼 정의

| 응용프로그램(Application) 혹은 서비스(Service)를 실행하는데 사용되는 하드웨어 및 소프트웨어 환경

| 기후서비스 플랫폼

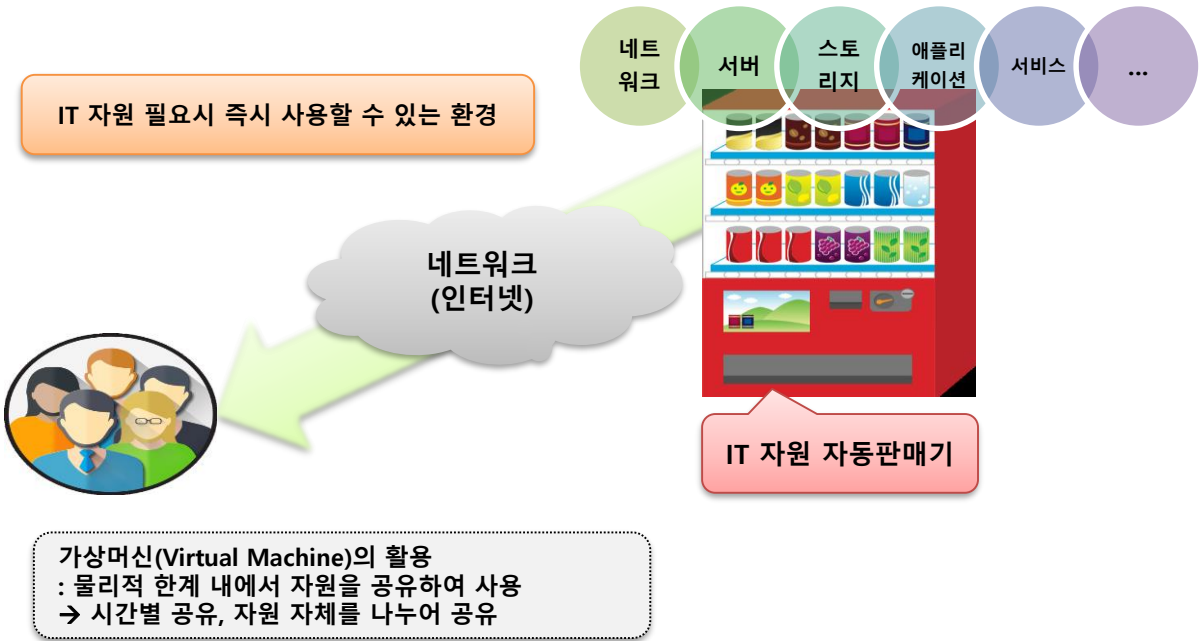
기후서비스 플랫폼 정의

| 기후서비스(Climate Service)를 실행하는데 사용되는 하드웨어 및 소프트웨어 환경

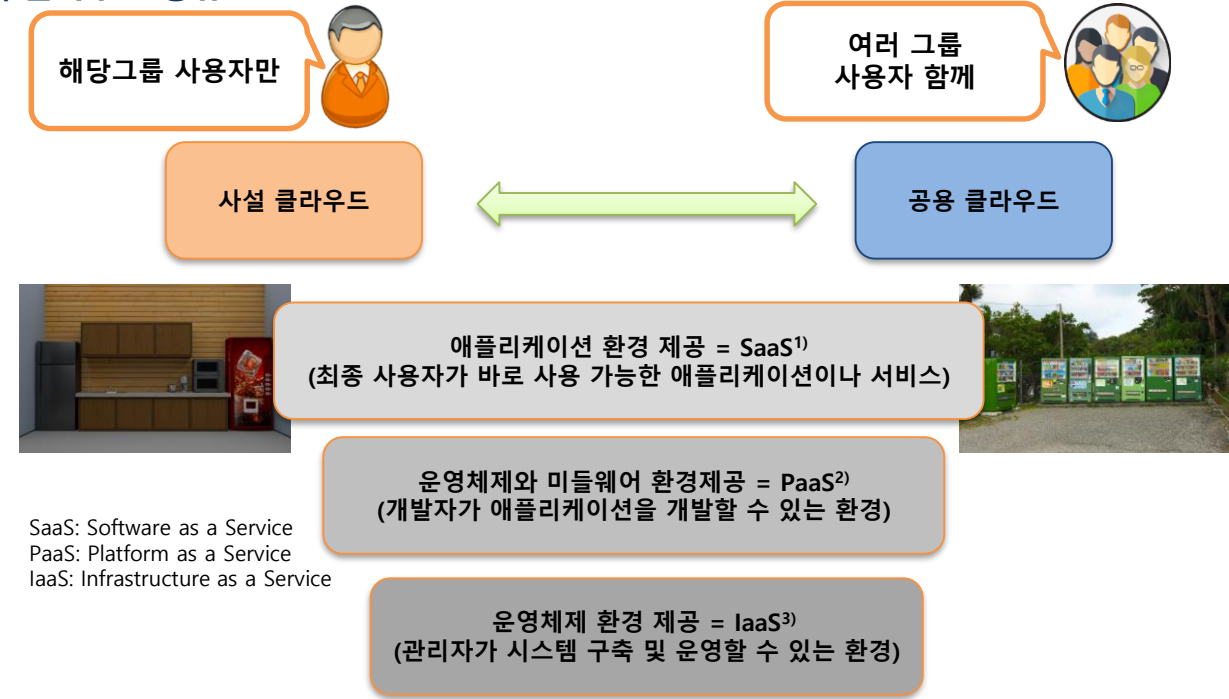


기후서비스 개발 과정부터 기능 재사용 고려 필요
 라이브러리 및 모듈의 재사용 → 생태계 구축
 서비스간의 mesh up을 위한 효과적이고 일관된 방법 필요
 기후예측, 수자원, 농업, 보건
 개발생산성 향상을 위한 정형화된 가이드라인 필요
 집약 시스템(Monolithic system)의 한계 극복 필요

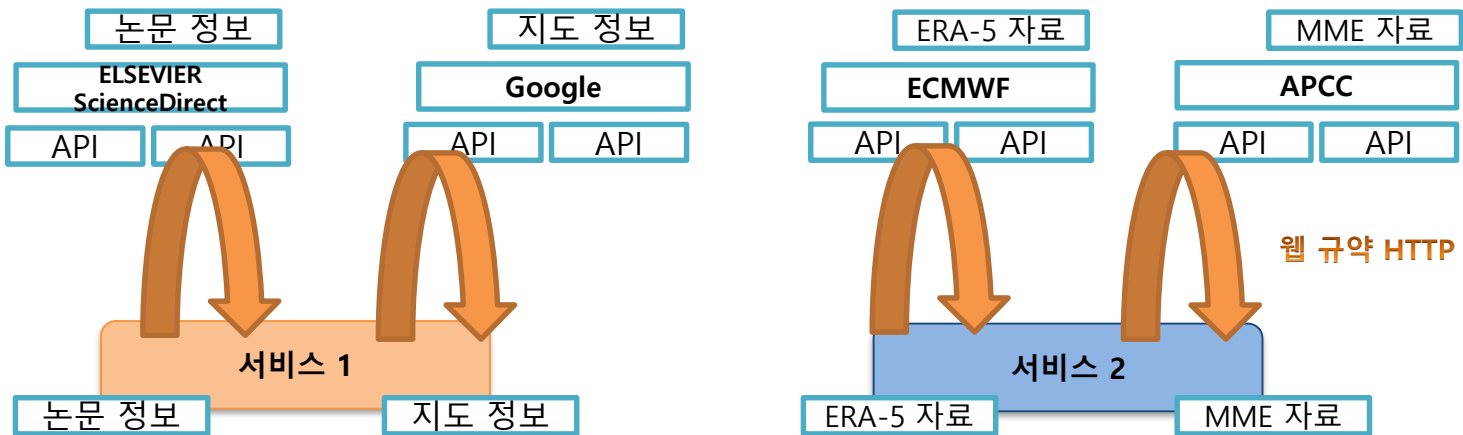
| 클라우드 컴퓨팅



| 클라우드 종류



| API (Application Programming Interface, 응용 프로그래밍 인터페이스)

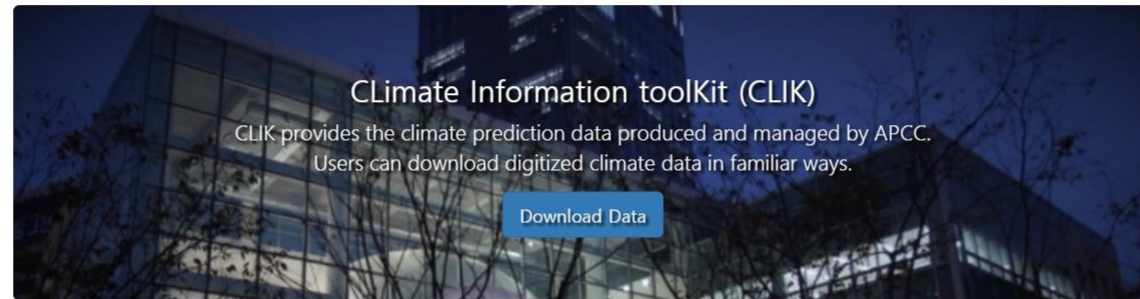


| APCC 기후서비스 통합플랫폼 CLIK (CLimate Information toolKit)

Climate Information toolKit (CLIK) Home Dataset Processing CLIK API Documents Help Desk

Member

Login
Register



Notice

CLIK provides digitized APCC Multi-Model Ensemble Prediction, Individual Model, and Clipped CIMP5 Data.

Learn More

Open API

The CLIK Open Application Program Interface (API) is a programmable interfacing service that supports accessing CLIK climate data in user programs.

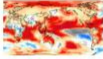
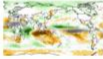

Learn More

Comment & Feedback

Please give us new suggestions and comments about CLIK.

Feedback

Latest Dataset

-  2023 JASON D APCC MME Prediction Dataset(Temperature) **New**
Probabilistic MME forecasts of 2m temperature for July 2023 - December 2023. Normal conditions are computed with respect to the common base period of participating models in the APCC MME prediction (1991-2010)
-  2023 JASON D APCC MME Prediction Dataset(Precipitation) **New**
Probabilistic MME forecasts of precipitation for July 2023 - December 2023. Normal conditions are computed with respect to the common base period of participating models in the APCC MME prediction (1991-2010)
-  2023 July Individual Model Prediction(KMA GLOSEA6GC3.2) **New**
Probabilistic Individual Model Prediction of KMA GLOSEA6GC3.2.

| APCC 기후서비스 통합플랫폼 CLIK (CLimate Information toolKit) – 기후자료 다운로드

Climate Information toolKit (CLIK) Home Dataset Processing My Jobs CLIK API Documents Help Desk Member

- MME-3MON
- MME-6MON
- MME-MODEL
- High Resolution MME
- BSISO
- CMIP5
- ERA5
- NCEP Reanalysis

기후자료서비스 실습

CLimate Information toolKit (CLIK)

CLIK provides the climate prediction data produced and managed by APCC. Users can download digitized climate data in familiar ways.

[Download Data](#)

Notice

CLIK provides digitized APCC Multi-Model Ensemble Prediction, Individual Model, and Clipped CIMP5 Data.

[Learn More](#)

Open API

The CLIK Open Application Program Interface (API) is a programmable interfacing service that supports accessing CLIK climate data in user programs.

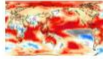
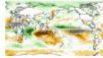

[Learn More](#)

Comment & Feedback

Please give us new suggestions and comments about CLIK.

[Feedback](#)

Latest Dataset

-  **2023 JASOND APCC MME Prediction Dataset(Temperature)** New
Probabilistic MME forecasts of 2m temperature for July 2023 - December 2023. Normal conditions are computed with respect to the common base period of participating models in the APCC MME prediction (1991-2010)
-  **2023 JASOND APCC MME Prediction Dataset(Precipitation)** New
Probabilistic MME forecasts of precipitation for July 2023 - December 2023. Normal conditions are computed with respect to the common base period of participating models in the APCC MME prediction (1991-2010)
-  **2023 July Individual Model Prediction(KMA GLOSEA6GC3.2)** New
Probabilistic Individual Model Prediction of KMA GLOSEA6GC3.2.

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| APCC 기후서비스 통합플랫폼 CLIK (CLimate Information toolKit) – 기후자료처리(Clipping, Composite, Masking)

The screenshot shows the APCC Climate Information toolKit (CLIK) website. The top navigation bar includes links for Home, Dataset, Processing, My Jobs, CLIK API, Documents, Help Desk, and Member. The 'Processing' dropdown menu is open, highlighting 'Downscale', 'Clipping', and 'Composite'. The main banner features the text 'CLimate Information toolKit (CLIK)' and 'CLIK provides the climate prediction data produced and managed by APCC. Users can download digitized climate data in familiar ways.' with a 'Download Data' button. A large Korean text overlay reads '기후자료 처리서비스 실습'. Below the banner are three sections: 'Notice' (CLIK provides digitized APCC Multi-Model Ensemble Prediction, Individual Model, and Clipped CIMP5 Data), 'Open API' (The CLIK Open Application Program Interface (API) is a programmable interfacing service that supports accessing CLIK climate data in user programs), and 'Comment & Feedback' (Please give us new suggestions and comments about CLIK). The 'Latest Dataset' section lists three datasets: '2024 ONDJFM APCC MME Prediction Dataset(Temperature)', '2024 ONDJFM APCC MME Prediction Dataset(Precipitation)', and '2024 October Individual Model Prediction(KMA GLOSEA6GC3.2)'. The footer contains links for About CLIK, Release Note, Contact Us, Disclaimer/Privacy, Cookies, and Copyright © 2019 APEC Climate Center.

| APCC 기후서비스 통합플랫폼 CLIK (CLimate Information toolKit) – 계절예측 및 검증 (Prediction/Verification)

The screenshot displays the CLIK (Climate Information toolKit) website interface. At the top, a navigation bar includes links for Home, Dataset, Processing, My Jobs, CLIK API, Documents, Help Desk, and Member. The 'Processing' menu is open, highlighting 'Prediction', 'Verification', and 'High Resolution Prediction'. A large banner features the text 'Climate Information toolKit (CLIK)' and 'Users can download digitized climate data in familiar ways.' with a 'Download Data' button. A semi-transparent box with Korean text '사용자 맞춤형 계절예측 및 검증 실습' is overlaid on the banner. Below the banner are three sections: 'Notice' (CLIK provides digitized APCC Multi-Model Ensemble Prediction, Individual Model, and Clipped CIMP5 Data), 'Open API' (The CLIK Open Application Program Interface (API) is a programmable interfacing service that supports accessing CLIK climate data in user programs.), and 'Comment & Feedback' (Please give us new suggestions and comments about CLIK.). The 'Latest Dataset' section lists three datasets: '2024 ONDJFM APCC MME Prediction Dataset(Temperature)', '2024 ONDJFM APCC MME Prediction Dataset(Precipitation)', and '2024 October Individual Model Prediction(KMA GLOSEA6GC3.2)'. The footer contains links for About CLIK, Release Note, Contact Us, Disclaimer/Privacy, Cookies, and Copyright © 2019 APEC Climate Center.

| APCC 기후서비스 통합플랫폼 CLIK (CLimate Information toolKit) – 상세화 예측(Downscale)

Climate Information toolKit (CLIK) Home Dataset Processing My Jobs CLIK API Documents Help Desk Member

Prediction
Verification
High Resolution Prediction
Downscale
Clipping
Composite
Masking

9/27(금) 11:10 ~ 12:40
상세화 예측실습

CLimate Information toolKit (CLIK)

CLIK provides the climate prediction data produced and managed by APCC.
Users can download digitized climate data in familiar ways.

Download Data

Notice

CLIK provides digitized APCC Multi-Model Ensemble Prediction, Individual Model, and Clipped CIMPS Data.

Learn More

Open API

The CLIK Open Application Program Interface (API) is a programmable interfacing service that supports accessing CLIK climate data in user programs.

Learn More

Comment & Feedback

Please give us new suggestions and comments about CLIK.

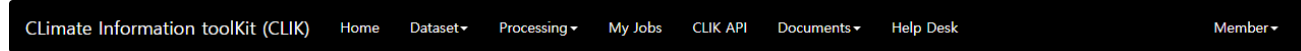
Feedback

Latest Dataset

- 2024 ONDJFM APCC MME Prediction Dataset(Temperature) **New**
Probabilistic MME forecasts of 2m temperature for October 2024 - March 2025. Normal conditions are computed with respect to the common base period of participating models in the APCC MME prediction (1991-2010)
- 2024 ONDJFM APCC MME Prediction Dataset(Precipitation) **New**
Probabilistic MME forecasts of precipitation for October 2024 - March 2025. Normal conditions are computed with respect to the common base period of participating models in the APCC MME prediction (1991-2010)
- 2024 October Individual Model Prediction(KMA GLOSEA6GC3.2) **New**
Probabilistic Individual Model Prediction of KMA GLOSEA6GC3.2.

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APCC 기후서비스 통합플랫폼 CLIK (CLimate Information toolKit) – AIMS



AIMS

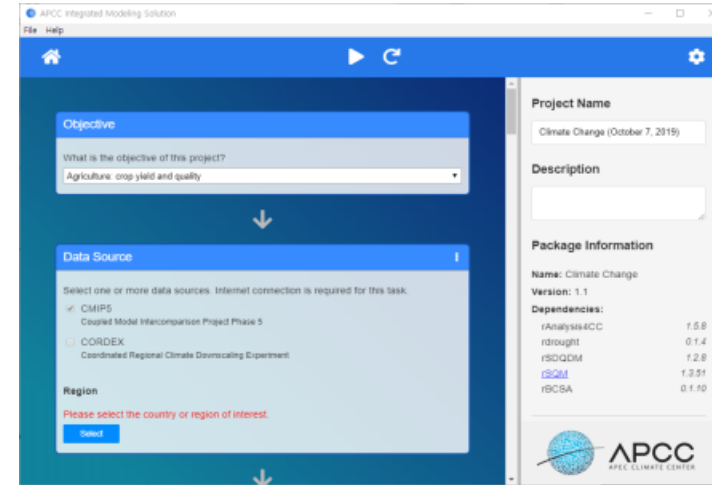
APCC Intergrated Modeling Solution (AIMS)

Welcome to AIMS APCC Integrated Modeling Solution

APCC Intergrated Modeling Solution (AIMS) supports the production of statistical downscaling and evaluation information about seasonal forecast/climate change scenarios. AIMS is a project initiated by the APEC Climate Center. AIMS targets climate change experts and non-experts, and its main purpose is to provide users with easy-to-use tools having many features included in a single solution. AIMS is still in its early stages and many more advanced features will be implemented in the coming years.

Download Link

- AIMS Latest release for windows (AIMS 3.1.2)
- AIMS Sample Data
- AIMS User Manual PDF File (Korean)
- AIMS User Manual PDF File (English)



AIMS (APCC Integrated Modeling Solution)

| <http://aims.apcc21.org>

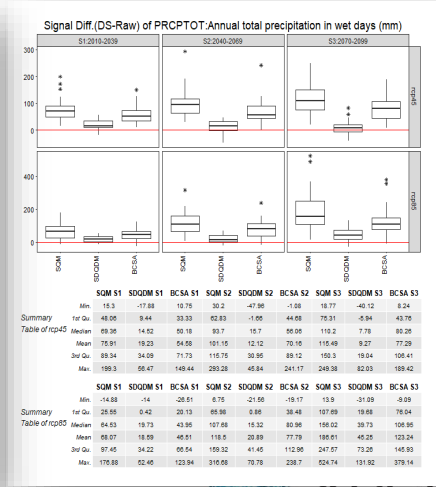
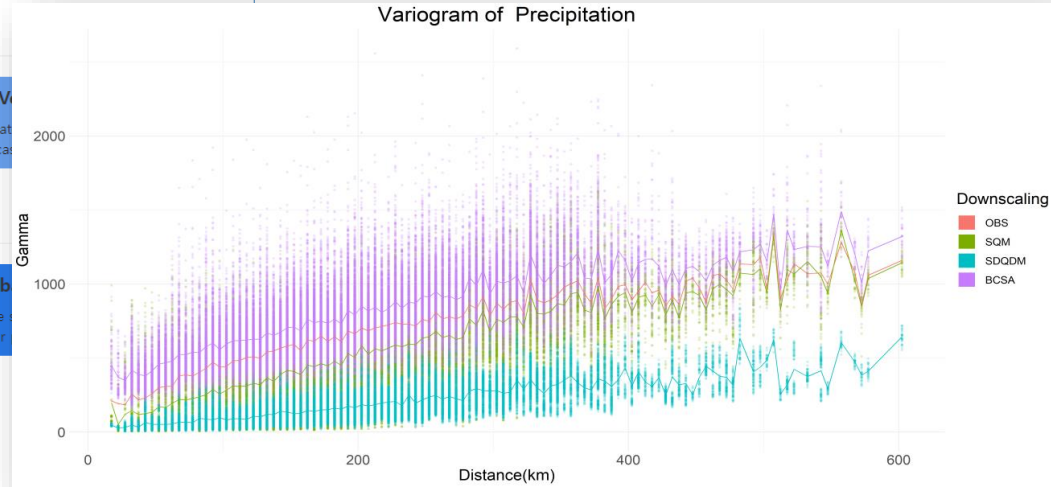
| 계절예측 및 기후변화 시나리오에 대한 통계적 상세화/평가 정보를 생산할 수 있습니다.

AIMS

Easy	Fast	V
Modeling numerous Climate Change scenarios can't get any easier than this.	APCC provides best solutions to bring fastest simulations results on your screen.	APCC's proven Climate... you best forecast

Product Features

Card User Interface	Ever-improving software	Project-b
Familiar card based interface brings you up-to-speed on climate change modeling.	AIMS is under active development. The software grows as your needs become more sophisticated.	All of your works are find your



| APCC 기후서비스 통합플랫폼 CLIK (CLimate Information toolKit) – CLIK API



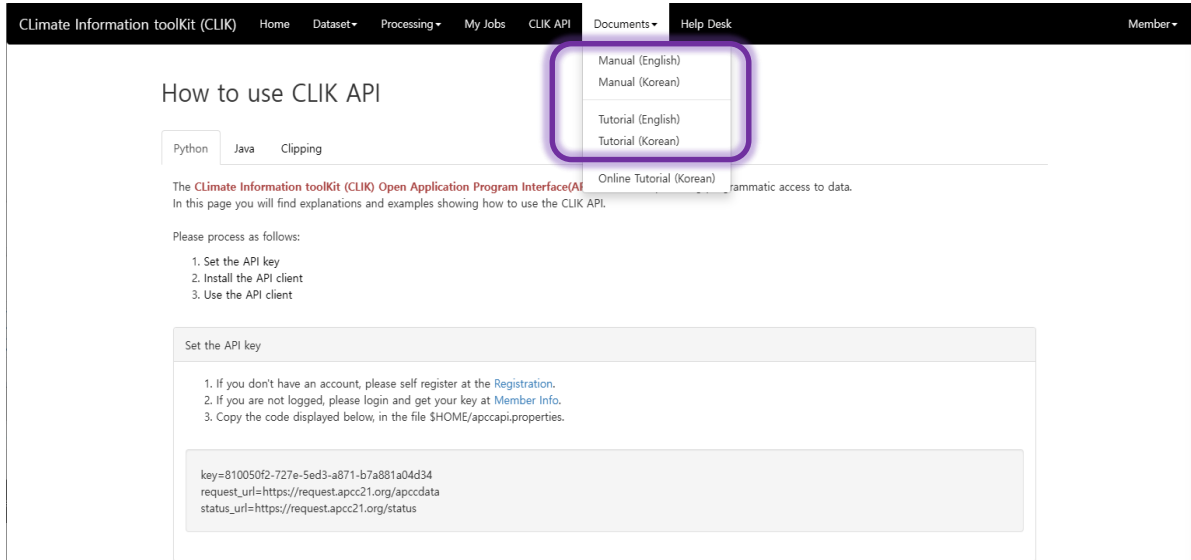
```
#!/usr/bin/env python

import apccapi

c = apccapi.Client()

c.retrieve(
    {
        'jobtype': 'MME',
        'dataset': 'MME_6MONTH',
        'type': 'HINDCAST',
        'method': 'GAUS',
        'variable': ['prec', 't2m'],
        'period': ['Monthly mean', 'Seasonal mean'],
        'yearmonth': ['201909']
    },
    'mme6.zip'
)
```

| APCC 기후서비스 통합플랫폼 CLIK (CLimate Information toolKit) – 안내문서(매뉴얼/튜토리얼)



사용자 튜토리얼 (국/영문)

CLIK(CLIimate Information toolKit)

APEC Climate Center Climate Service Platform Tutorial (cliiks.apcc21.org)

November 2021

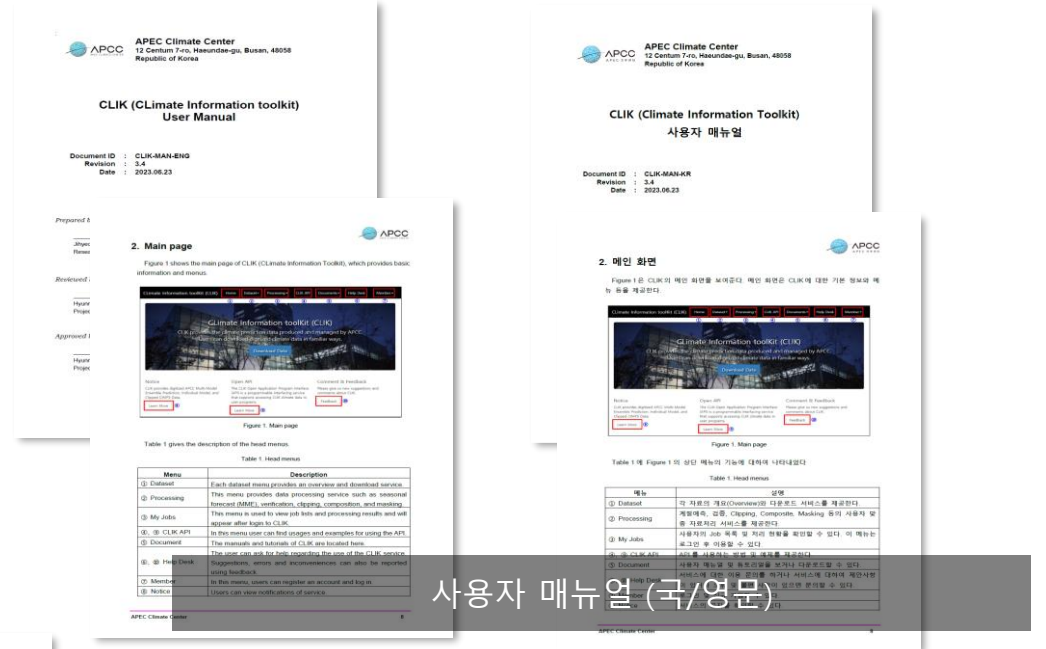


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APEC 기후센터 기후서비스플랫폼 튜토리얼 (cliiks.apcc21.org)

2023년 6월



사용자 매뉴얼 (국/영문)

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| APCC 기후서비스 통합플랫폼 CLIK (CLimate Information toolKit) – 온라인 튜토리얼

Climate Information toolKit (CLIK) Home Dataset Processing My Jobs CLIK API Documents Help Desk Member

Manual (English)
Manual (Korean)
Tutorial (English)
Tutorial (Korean)
Online Tutorial (Korean)

How to use CLIK API

Python Java Clipping

The CLimate Information toolKit (CLIK) Open Application Program Interface (API) provides automatic access to data. In this page you will find explanations and examples showing how to use the CLIK API.

Please process as follows:

1. Set the API key
2. Install the API client
3. Use the API client

Set the API key

1. If you don't have an account, please self register at the [Registration](#).
2. If you are not logged, please login and get your key at [Member Info](#).
3. Copy the code displayed below, in the file \$HOME/apccapi.properties.

```
key=810050f2-727e-5ed3-a871-b7a881a04d34
request_url=https://request.apcc21.org/apccdata
status_url=https://request.apcc21.org/status
```

Install the API client

Please download the Python API via this [link](#).
You can install API client by running below at your working directory.

```
$ tar xvf apccapi.tar.gz
```

Use the API client

Once the API client is installed, it can be used to request data from the datasets.
You can download using the below sample python code.

Dataset:

- MME_3MONTH
- MME_6MONTH
- MODEL
- CMIP5

MME_3MONTH MME_6MONTH MODEL CMIP5

[실습]
온라인 튜토리얼 접속 및 사용

Climate Information toolKit (CLIK) Home Dataset Processing CLIK API Documents Help Desk Member

Climate Information toolKit(CLIK) 온라인 튜토리얼

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I. CLIK 플랫폼 쉽게 따라하기

- CLIK 플랫폼 접속하기

APCC 기후예측정보를 활용하기 위해 자신이 평소 자주 사용하는 웹 브라우저(Google Chrome, Microsoft Edge 등)를 실행한 뒤, CLIK 플랫폼 (<https://cliks.apcc21.org>)에 접속합니다.

| APCC 기후서비스 통합플랫폼 CLIK (CLimate Information toolKit) – Help Desk

The image displays the APCC CLIK Help Desk interface. At the top, a navigation bar includes 'Climate Information toolKit (CLIK)', 'Home', 'Dataset', 'Processing', 'CLIK API', 'Documents', 'Help Desk' (highlighted with a yellow box), and 'Member' (with 'Login' and 'Register' options). Below the navigation bar is a main banner for 'Climate Information toolKit (CLIK)' with a 'Download Data' button. A large blue arrow points from the 'Help Desk' menu item to a central screenshot of the help desk page. This screenshot shows a 'Welcome to APCC Help Desk' message with a 'Create ticket' button highlighted in a red box. To the left of the main screenshot is a 'Notice' section and a 'Latest Dataset' section. To the right is a '새로운 Ticket' (New Ticket) form with fields for '제목' (Title), '본문' (Content), '그룹' (Group), and '상태' (Status), along with a '작성' (Write) button. A red box at the bottom of the main screenshot highlights a '+' icon in the mobile app interface.

APCC 기후서비스 플랫폼 사용자 가입

플랫폼 홈페이지 접속

• <https://cliks.apcc21.org>

회원 가입 페이지로 이동

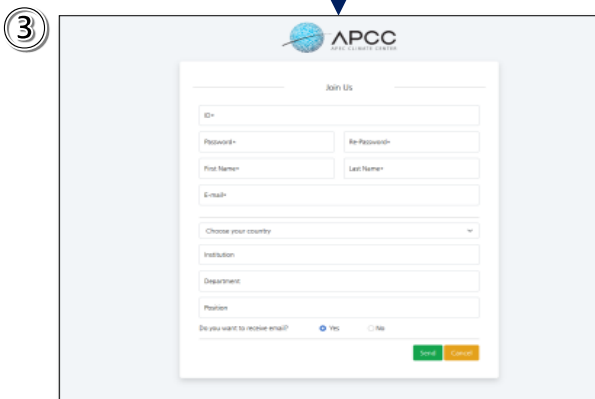
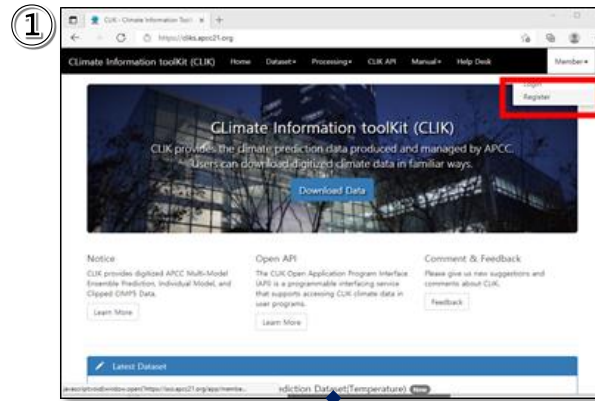
APCC Single Sign On System 이동 완료

• 이름, e-mail 주소를 통한 가입 여부 확인 및 가입
• Kakao, Naver, Google, Facebook 계정 활용가능

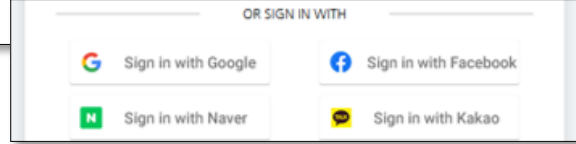
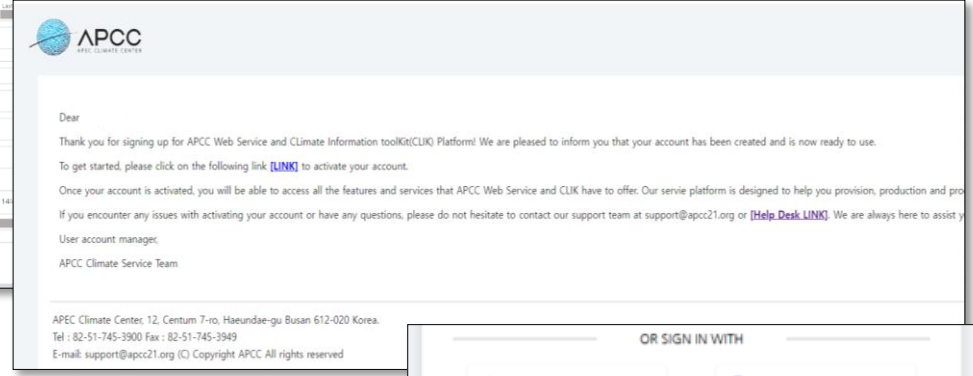
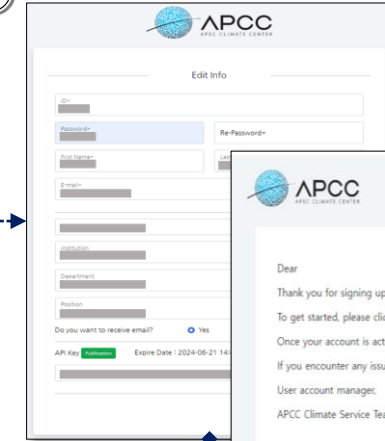
이메일 인증

• 본인 e-mail 내 인증메일 확인

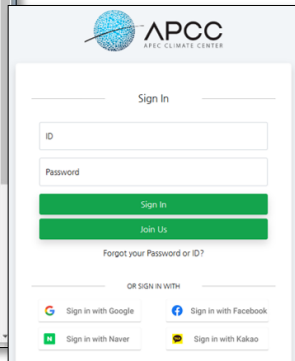
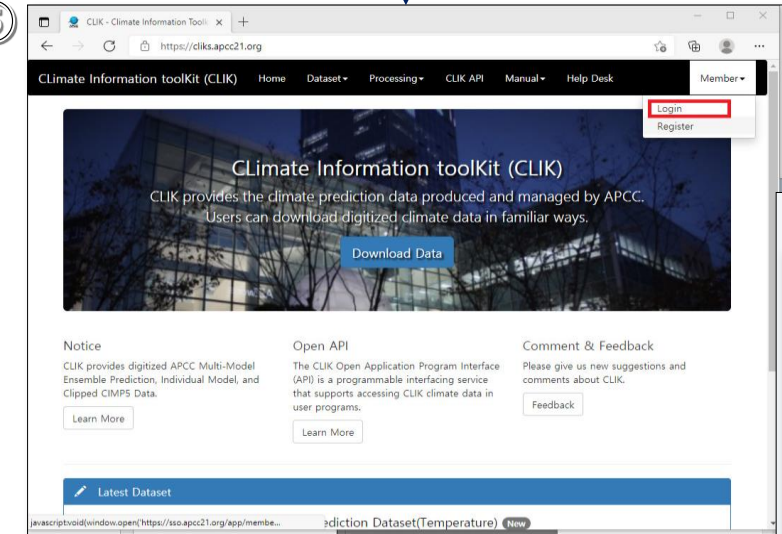
로그인



4



5



[실습]
회원 가입 및 로그인

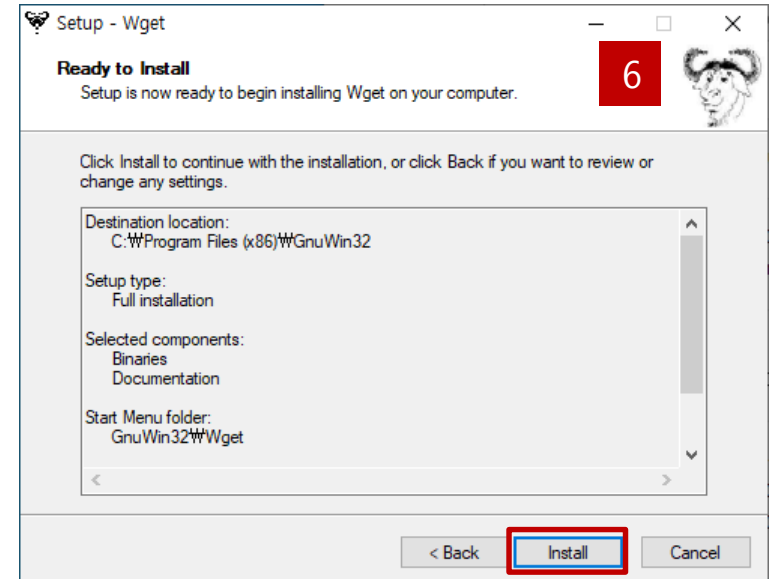
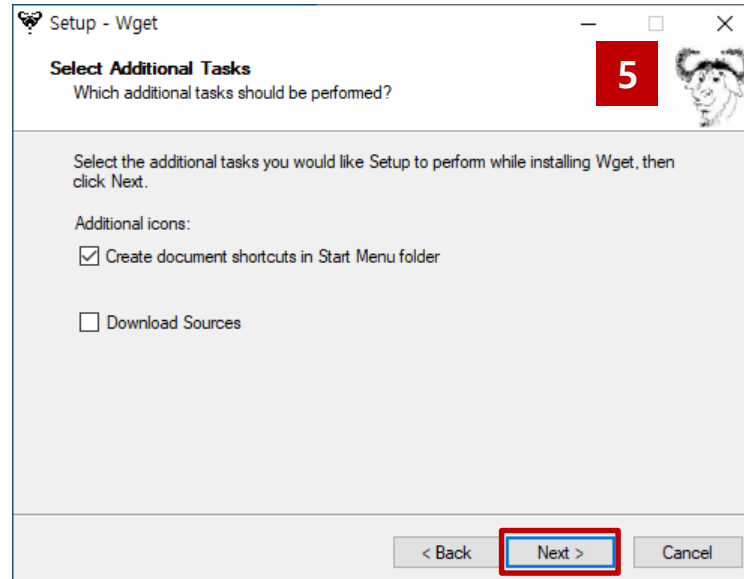
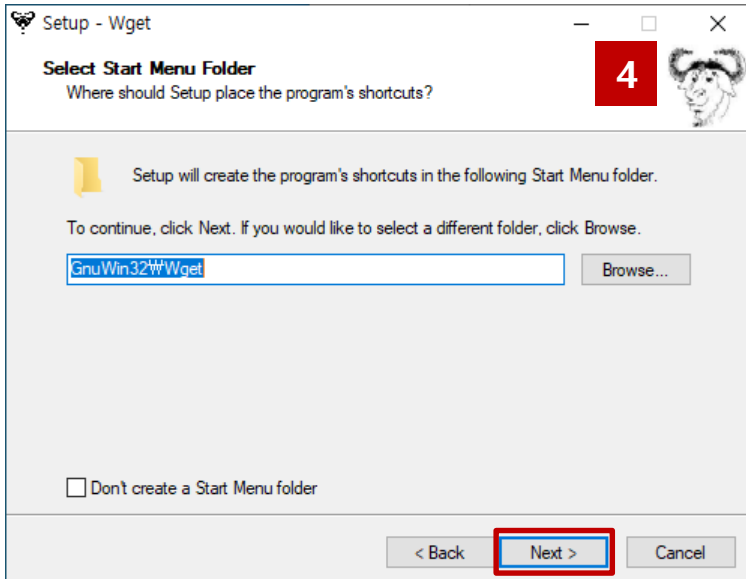
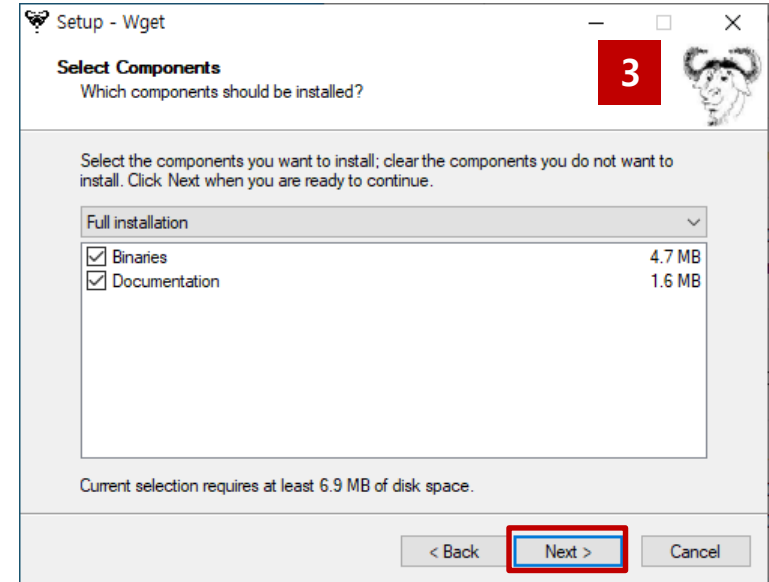
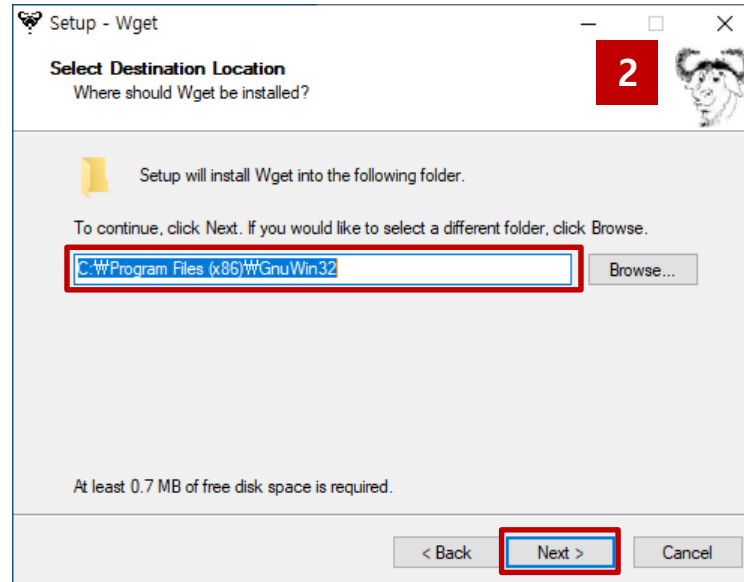
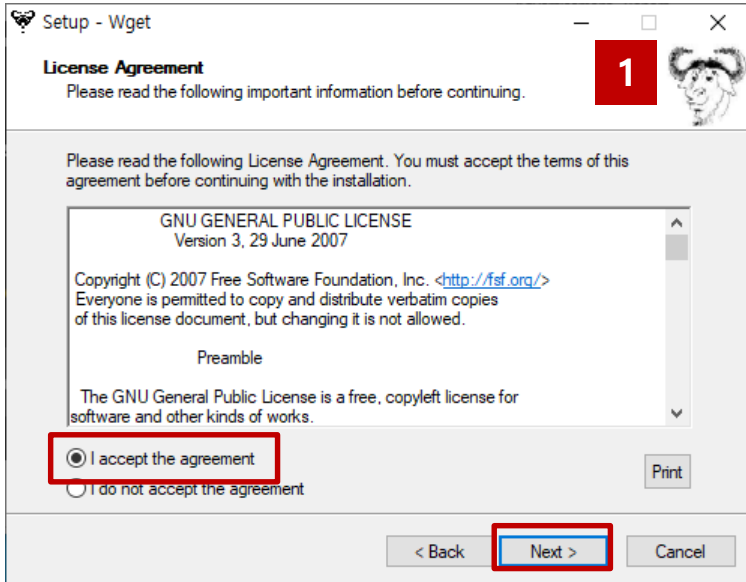


2024 APCC 기후정보서비스 사용자 워크숍

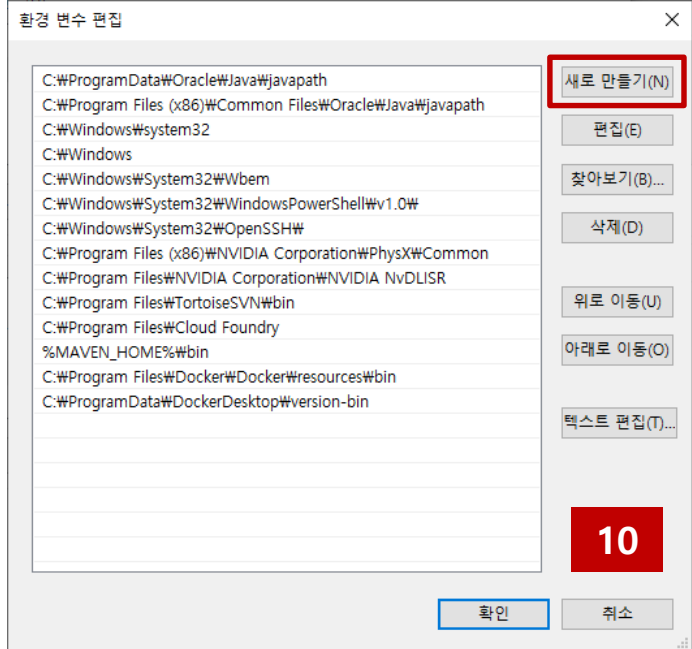
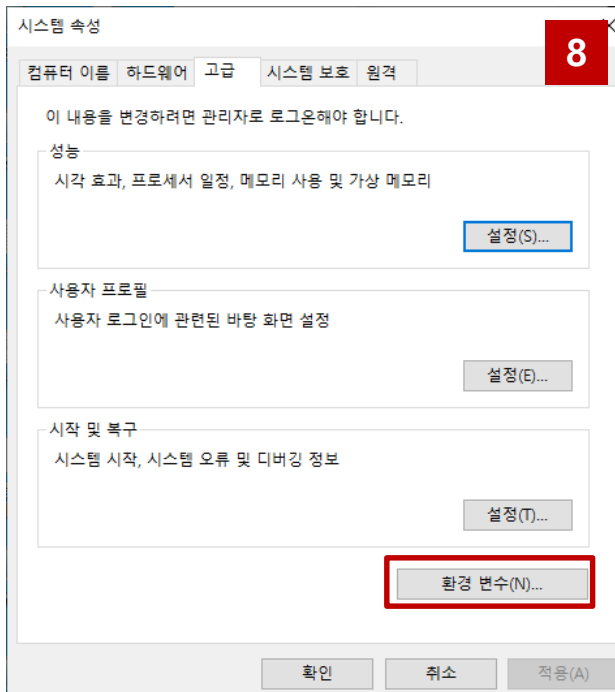
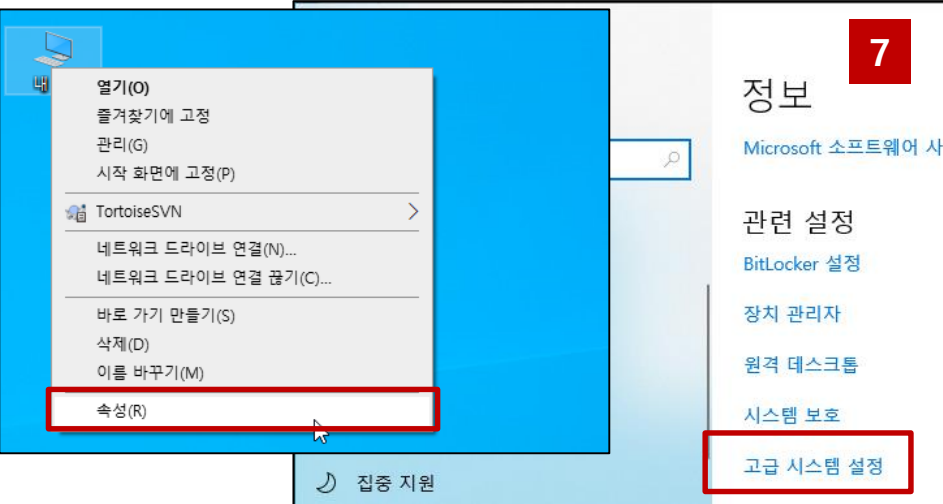
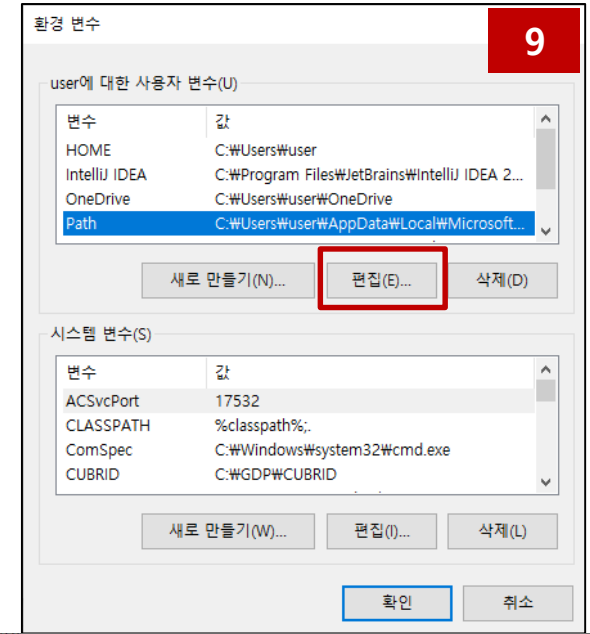
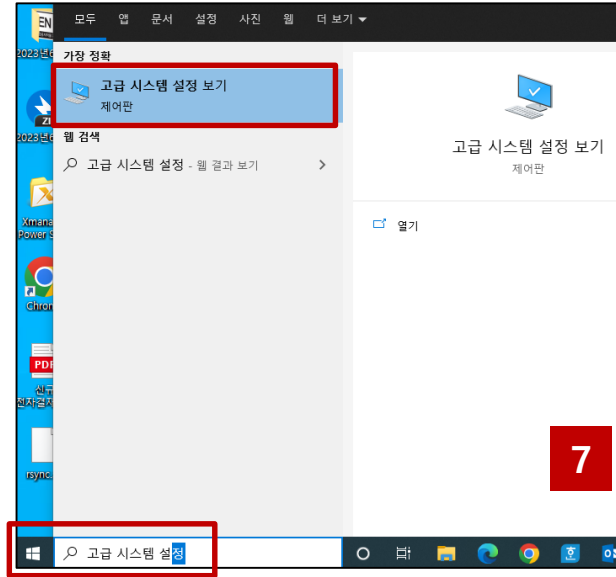
APCC 기후서비스 통합 플랫폼

기후자료서비스 실습

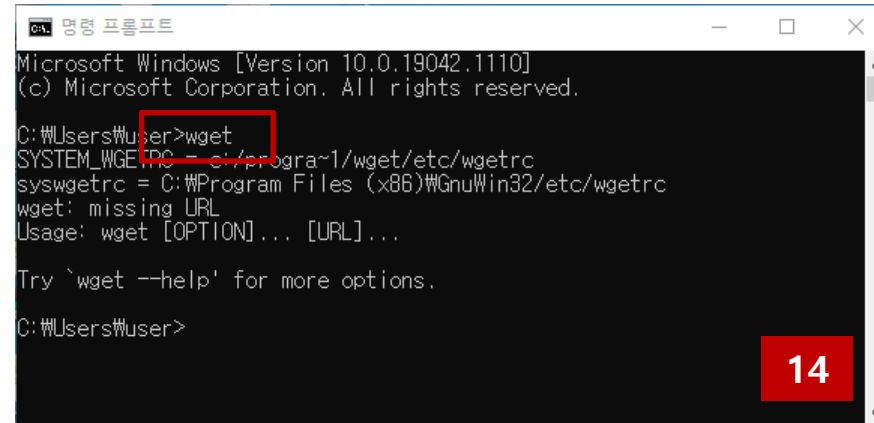
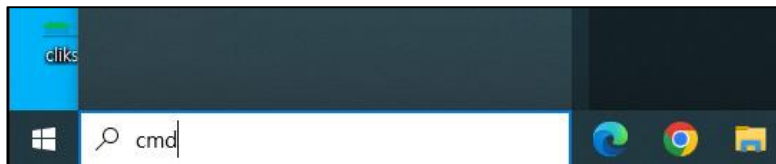
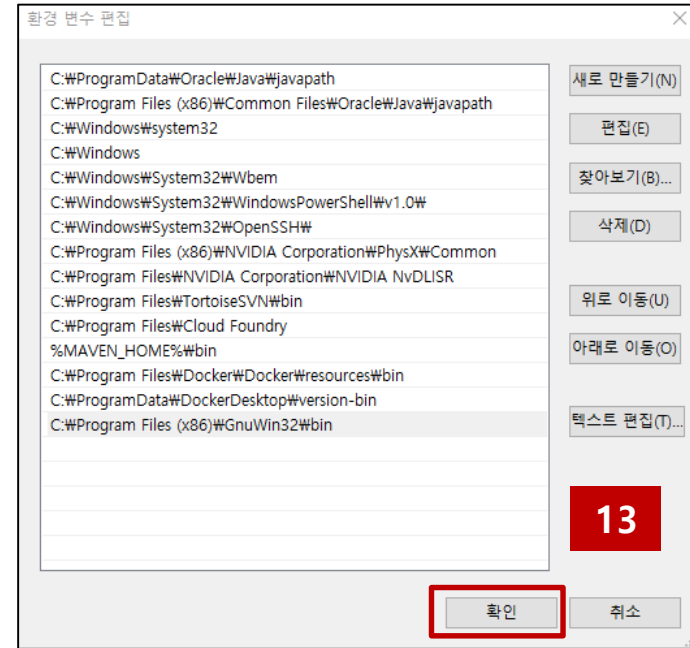
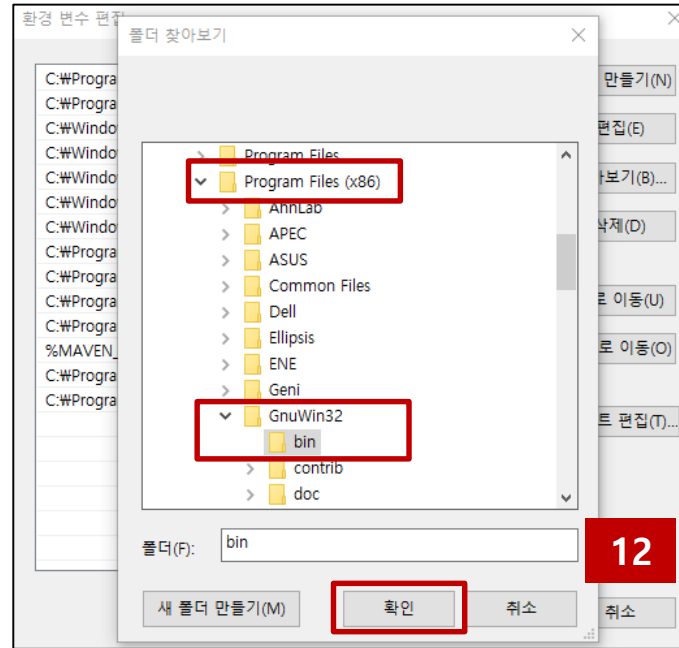
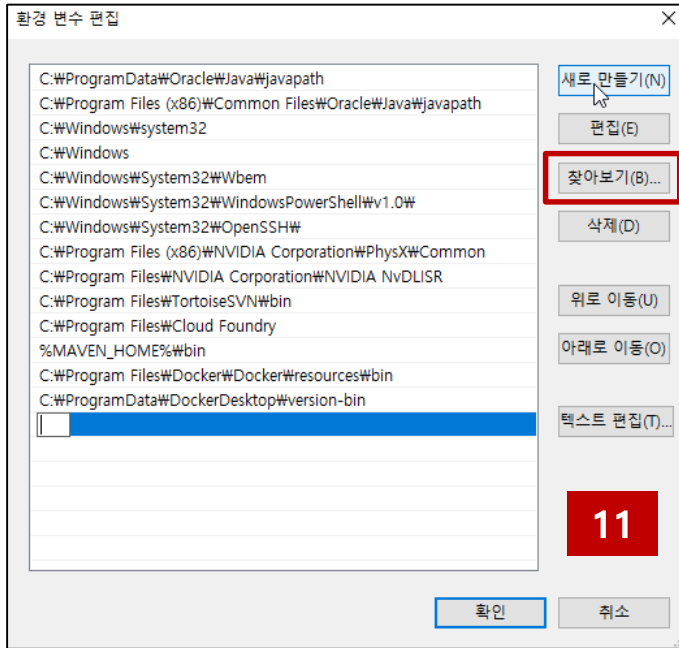
| GnuWin wget 설치: wget-1.11.4-1-setup.exe



| GnuWin wget 설치: wget-1.11.4-1-setup.exe



| GnuWin wget 설치: wget-1.11.4-1-setup.exe



| MME (저해상도 2.5 x 2.5) – Overview

APCC 계절예측

- APEC 회원국 기상청 및 연구 기관으로 부터 수집된 전 지구 예측 모델의 300개 이상의 앙상블 자료를 종합
- 다중 모델 앙상블(Multi-Model Ensemble, MME) 기법 적용
- 3개월, 6개월 예측자료 제공
- Forecast(기후예측), Hindcast(과거 기후 재현)
- Monthly mean/Seasonal mean 구분 제공

단정 예측(Deterministic MME)

- 개별 모델의 앙상블 예측 값을 각 모델에 동일한 가중치를 부여하여 종합하는 방식
- 예측 값은 편차(기후 값 혹은 평년 값과의 차이)로 제공됨
- 기후 값, 평년 값: 평년 기간 동안의 평균값
- Simple Composite Method (SCM)

확률 예측(Probabilistic MME)

- 개별 모델의 예측 확률을 각 모델별로 가중치를 부여하여 통합하는 방식
- 확률 값 범주: 평년보다 높을 확률, 평년과 비슷할 확률, 평년보다 낮을 확률
- Gaussian fitting method (GAUS)

예보기간

Dataset Processing

- MME-3MON
- MME-6MON
- MME-MODEL
- High Resolution MME
- BSISO
- CMIP5
- ERA5
- NCEP Reanalysis

Overview Download

APCC MME: Multi-Model Ensemble Forecast

The APCC seasonal forecast is based on multi-model ensemble (MME) prediction system around 20th of every month. Currently, 15 operational centers and research institutes from APCC MME operational prediction system by routinely providing their predictions in the form of ensemble members. APCC's real-time operational forecasts are issued in both deterministic (based on ensemble mean) forms and more detailed description of the methods is as follows.

- 1. Deterministic MME Forecast**
The deterministic forecast is based on a simply average of bias-corrected ensemble means from each model with equal weight to create a multi-model forecast. The ensemble mean anomaly forecasts for each individual model is calculated by their own climatology from the hindcasts.
- 2. Probabilistic MME Forecast**
The probabilistic forecast is based on an uncalibrated MME with model weights being proportional to the square root of ensemble size, and a Gaussian fitting method for the estimation of the tercile-based categorical probabilities, that is, the probability of below-normal (BN), near-normal (NN), and above-normal (AN) categories with respect to climatology (Min et al. 2009). The procedure for the probabilistic forecast consists of following two steps.
 - **Estimate the individual model probabilities**
The upper and lower terciles are determined separately for each model using their mean and standard deviation of hindcasts. Then, the forecast probability for each category is estimated as a portion of the cumulative probability of their forecast sample associated with the category.

MME – Download

MME 자료 Type 선택

MME 기법 선택

MME 변수 선택

자료 통계 기간 선택

Dataset ▼ Process **1**

- MME-3MON
- MME-6MON
- MME-MODEL
- High Resolution MME
- BSISO
- CMIP5
- ERA5
- NCEP Reanalysis

Type

FORECAST HINDCAST

Method

PMME DMME

GAUS SCM

Variable

prec slp sst t2m t850 z500

Period

Monthly mean Seasonal mean

2

Date 3개월 MME

* If you want to get data of each year or season at once, select year or season heads.

Download last season 최근 시즌 자료(zip) **3**

	JFM	FMA	MAM	AMJ	MJJ	JJA	JAS	ASO	SON	OND	NDJ	DJF
2015	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2016	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2017	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2018	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2019	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2020	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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2022	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2023	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>						

[실습]

- 예보기간 : 3개월
- 자료 Type : Forecast
- MME 기법 : GAUS
- 변수 : prec, slp
- 자료 통계 기간: Seasonal mean
- 자료 기간: 2024년 6, 7월

자료 년도, 시즌 선택

Date 6개월 MME

* If you want to get data of each year or season at once, select year or season heads.

Download last season 최근 시즌 자료(zip)

	JFMAMJ	FMAMJJ	MAMJJA	AMJJAS	MJJASO	JJASON	JASOND	ASONDJ	SONDJF	ONDJFM	NDJFMA	DJFMAM
2015	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2016	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2017	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2018	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2019	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2020	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2021	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2022	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2023	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

| MME – Download

- 4** **Request** Select to request as download job.
Create script Select to download script using wget.

자료 요청 후 Job 생성

All	Queued	Running	Failed	Complete
				6
Job type	Submission date	End date	Status	
MME_3MONTH	2023-07-03 10:29:56	2023-07-03 10:29:59	Download	

Docu
 Job ID: 64a2249420dd750006fe8f39

- 5** Processing ▾ **My Jobs** CLIK API

7 ZIP 64a2249420dd750...zip

8

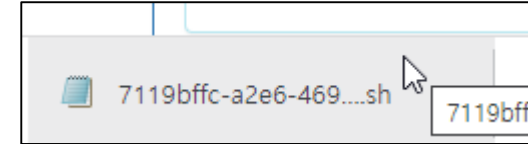
이름	압축 크기	원본 크기	파일 종류
FORECAST_GAUS_JUL_JAS_2023_prec.nc	136,305	192,376	NC 파일
FORECAST_GAUS_JUL_JAS_2023_slp.nc	138,257	192,376	NC 파일
FORECAST_GAUS_JUN_JJA_2023_prec.nc	135,360	192,376	NC 파일
FORECAST_GAUS_JUN_JJA_2023_slp.nc	138,038	192,376	NC 파일

| MME – Script Download

Request와 같은 방법으로 옵션 선택 후 script 요청

Request
Select to request as download job.

Create script
Select to download script using wget.



```
#!/bin/bash
#
# You can set verifying the certificate or not.
#certificate_option="--no-check-certificate"
certificate_option=""

#-----
# This script was written using bash.
# You can modify using the other shell(csh, ksh, windows command, and so on), other commands and options.
# If you want curl command, you can change command to 'curl' instead of 'wget'.
# But you need to change some options. Please check details at manuals of wget, curl.
#-----

echo `date +%F %T` " Now start to download."

#-----
# Each file of the same variable has the same file name.
# So please set(change) the folder to save file, or set file path to use '-O' option
#-----

wget ${certificate_option} https://download.apcc21.org/MME/3-MON/FORECAST/SCM/JUL/2023/prec.nc -O 3-MON_FORECAST_SCM_JUL_2023_prec.nc
wget ${certificate_option} https://download.apcc21.org/MME/3-MON/FORECAST/SCM/JUL/2023/slp.nc -O 3-MON_FORECAST_SCM_JUL_2023_slp.nc
```

인증서 검증 여부

[실습]

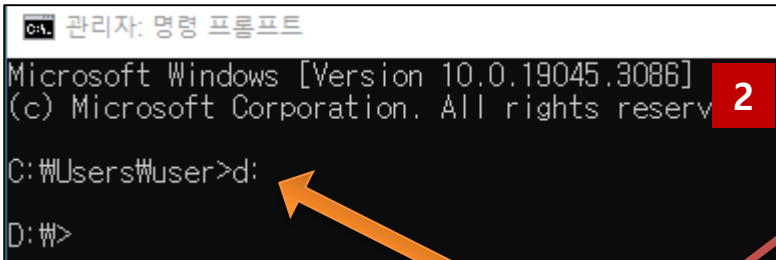
- 자료 : MME
- 예보기간 : 3개월
- 자료 Type : Forecast
- MME 기법 : SCM
- 변수 : prec, slp
- 자료 통계 기간: Monthly mean
- 자료 기간: 2024년 7월

다운로드 파일명 지정

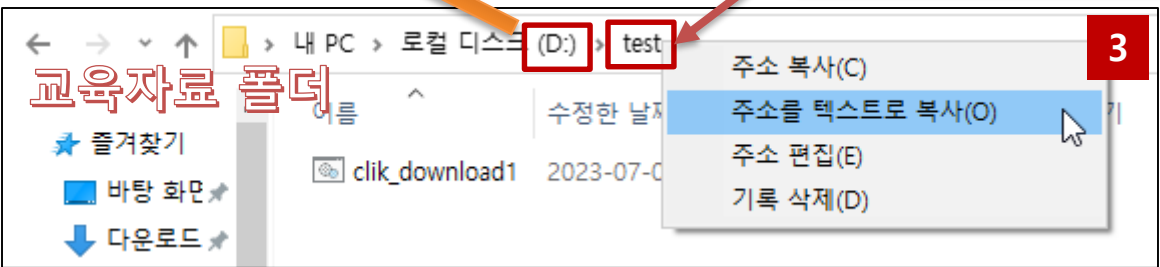
| MME – Script 실행

Windows의 경우 Windows Batch 파일 형식으로 편집 → 명령 프롬프트 (cmd) 에서 batch 실행

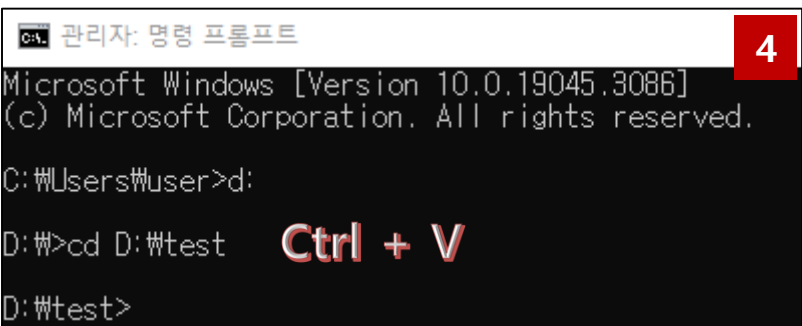
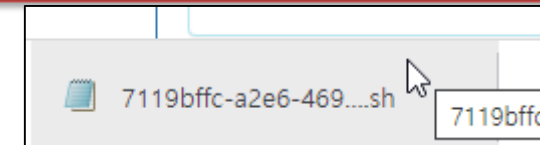
- [실습]**
- 자료 : MME
 - 예보기간 : 3개월
 - 자료 Type : Forecast
 - MME 기법 : SCM
 - 변수 : prec, slp
 - 자료 통계 기간: Monthly mean
 - 자료 기간: 2024년 7월



마우스 오른쪽 버튼

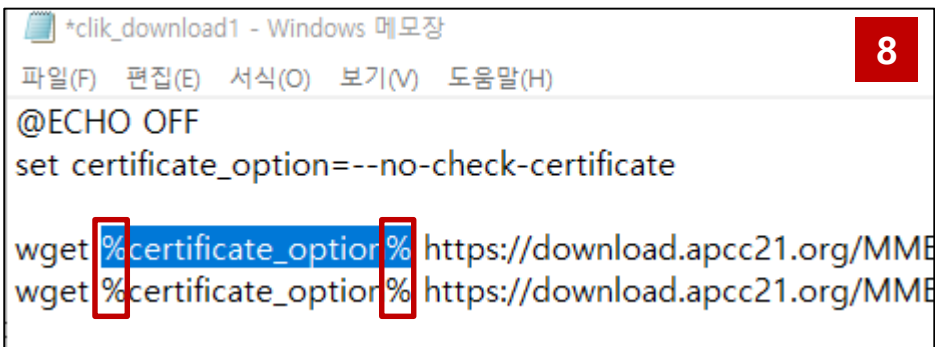
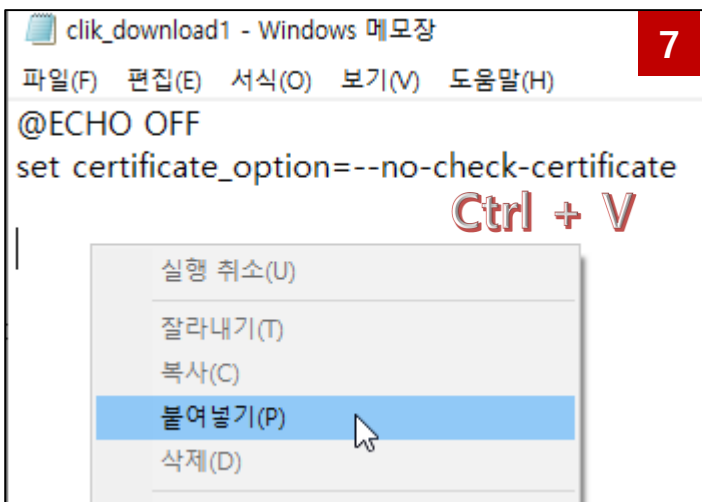


Download한 스크립트 파일

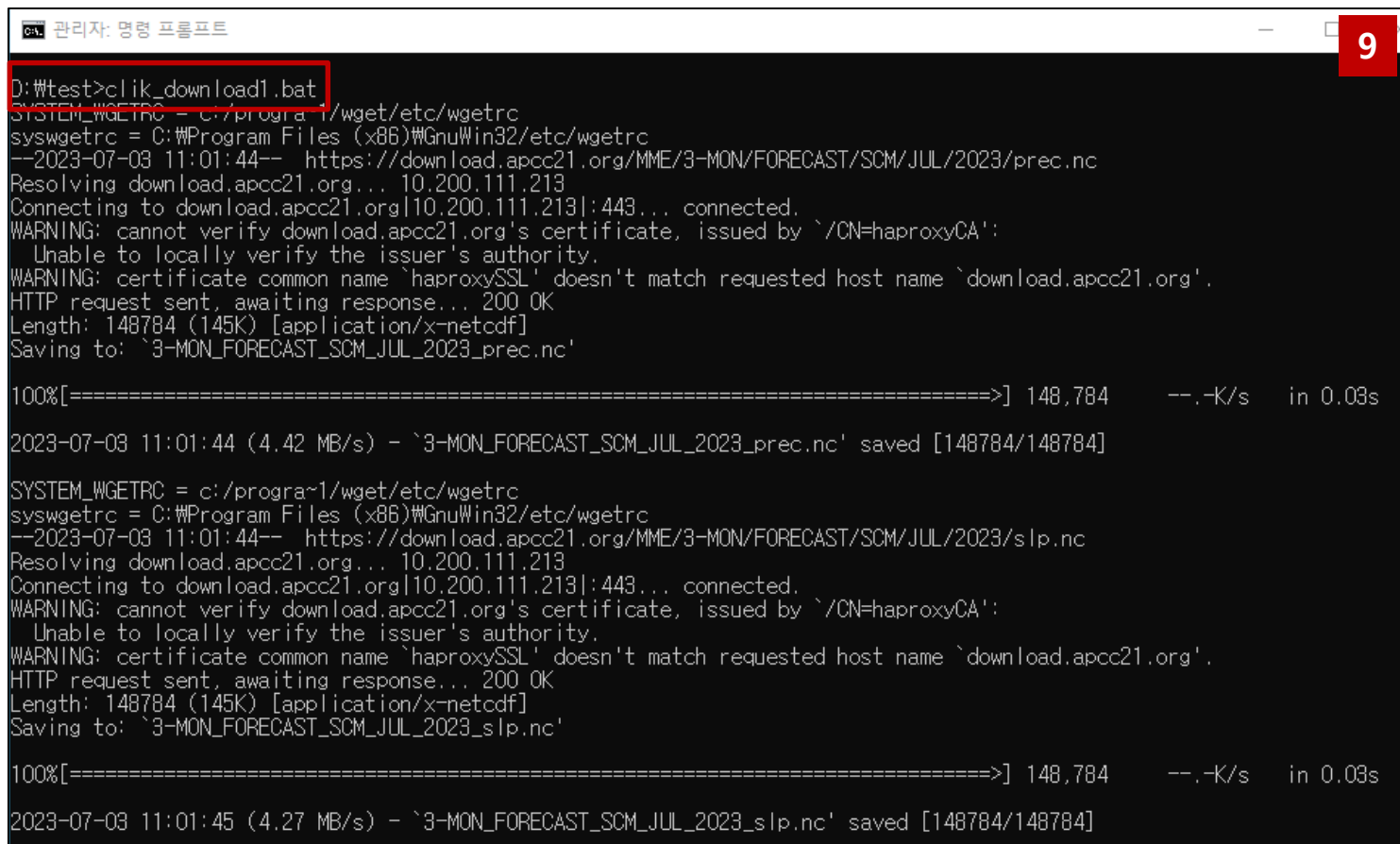


| MME – Script 실행

Windows의 경우 Windows Batch 파일 형식으로 편집 → 명령 프롬프트 (cmd) 에서 batch 실행



수정



| MME Model (저해상도 2.5 x 2.5) – Overview

현재 11개국 15개 Model 자료 제공

- 선행시간(발표일로부터 예측된 각 시점까지의 예측 수행 기간)은 모델마다 다름
- Forecast/Hindcast 구분 제공
- Hindcast는 매년 생산된 자료세트를 제공하며 제공하는 Hindcast 기간은 모델마다 다름
- 모델정보 상세 설명 참고:

www.apcc21.org/ser/global/modelDescription.do

Dataset ▾
Processing ▾

- MME-3MON
- MME-6MON
- MME-MODEL
- High Resolution MME
- BSISO
- CMIP5
- ERA5
- NCEP Reanalysis

Overview
Download

APCC MME Individual Models

Multi-Model Ensemble(MME) technique is one of the efficient solutions to improve the climate forecast skills. The basic idea of MME is to avoid inherent model errors and minimize the uncertainties by using independent and skillful models. For better forecast compared to single model forecast, APCC adopts one deterministic and one probabilistic MME methods by collecting individual model forecast data from 15 centers/institutions in 11 countries.

MME participating models

Table 1. Organization

Center/Institution	Country	System name
APCC	Korea	SCoPS
BCC	China	CSM1.1m
BoM	Australia	ACCESS-S2
CMCC	Italy	SPS3.5
CWB	Chinese Taipei	TCWB1Tv1.1
ECCC	Canada	CANSIPsv2.1
HMC	Russia	SL-AV
KMA	Korea	GloSea6GC3.2
METFR	France	SYS8
MGO	Russia	MGOAM-2
NCEP	United States of America	CFSv2

| MME Model – Download

자료 Type
선택

FORECAST 2

Type
 FORECAST HINDCAST

Institute
 APCC BCC BOM CMCC CWB ECCO HMC KMA METFR MGO MSC NCEP PNU PNU-RDA UKMO

Model
 CCSM3 SCOPS

Variable
 olr prec slp sst t2m t850 u200 u850 v200 v850 z500

기관 선택

Model
선택

변수 선택

자료 생산
년도 선택

HINDCAST

Type
 FORECAST HINDCAST

Year
 2015 2016 2017 2018 2019 2020 2021 2022 2023

Institute
 APCC BCC BOM CMCC CWB ECCO HMC KMA METFR MGO NCEP PNU PNU-RDA UKMO

Model
 SCOPS

Variable
 olr prec slp sst t2m t850 u200 u850 v200 v850 z500

Dataset ▾ Proc 1

MME-3MON
MME-6MON
MME-MODEL
High Resolution MME
BSISO
CMIP5
ERA5
NCEP Reanalysis

[실습]
- 자료 Type : Forecast
- 기관 : APCC
- Model : SCOPS
- 변수 : sst, t2m
- 자료 기간: 2024년 7월

자료 년도, 시즌 선택

3

Date

* If you want to get data of each year or season at once, select year or month heads.

	01	02	03	04	05	06	07	08	09	10	11	12
2017												<input type="checkbox"/>
2018	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2019	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2020	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2021	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2022	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2023	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>					

| MME Model – Download

- 4** **Request** Select to request as download job.
Create script Select to download script using wget.

자료 요청 후 Job 생성

5 Job ID: 64a4bd7e20dd750006fe8f51

6 Processing ▾ **My Jobs** CLIK API

7

All	Queued	Running	Failed	Complete
Job type	Submission date	End date	Status	
MODEL	2023-07-05 09:46:54	2023-07-05 09:46:58	Download	

8 ZIP 64a4bd7e20dd750...zip

9

이름	압축 크기	원본 크기	파일 종류
64a4bd7e20dd750006fe8f51.zip			
FORECAST_APCC_SCOPS_JUL_2023_sst.nc	1,220,944	2,545,016	NC 파일
FORECAST_APCC_SCOPS_JUL_2023_t2m.nc	1,944,750	2,545,016	NC 파일

| MME Model – Script Download

Request와 같은 방법으로 옵션 선택 후 Script 요청

Request

Select to request as download job.

Create script

Select to download script using wget.

[실습]

- 자료 Type : Forecast
- 기관 : APCC
- Model : SCOPS
- 변수 : sst, t2m
- 자료 기간: 2024년 7월

```

# change to your user id
userid="userid"
# change to your password
password="password"
# cookie file path(You can change to the other file.)
cookie_path="apcc.cookies"
# option to save cookies. If you want to save cookies, don't use the cookie_option.
#cookie_option=""
cookie_option="--load-cookies ${cookie_path} --save-cookies ${cookie_path} --keep-session-cookies "

# You can set verifying the certificate or not.
#certificate_option="--no-check-certificate"
certificate_option=""

echo `date +%F %T` " Now start to download."

#-----
# Each file of the same variable has the same file name.
# So please set(change) the folder to save file, or set file path to use '-0' option
#-----

wget ${cookie_option} --user=${userid} --password=${password} ${certificate_option} https://sdownload.apcc21.org/MODEL/FORECAST/APCC_SCOPS/JUL/2023/sst.nc -0 FORECAST_APCC_SCOPS_JUL_2023_sst.nc
wget ${cookie_option} --user=${userid} --password=${password} ${certificate_option} https://sdownload.apcc21.org/MODEL/FORECAST/APCC_SCOPS/JUL/2023/t2m.nc -0 FORECAST_APCC_SCOPS_JUL_2023_t2m.nc
    
```

아이디, 패스워드 설정

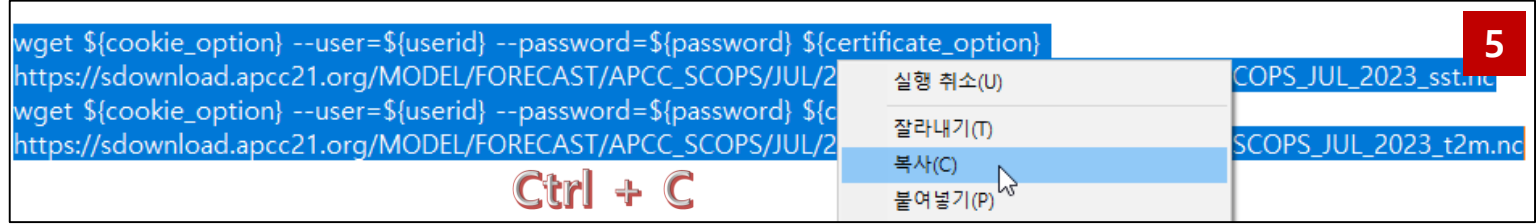
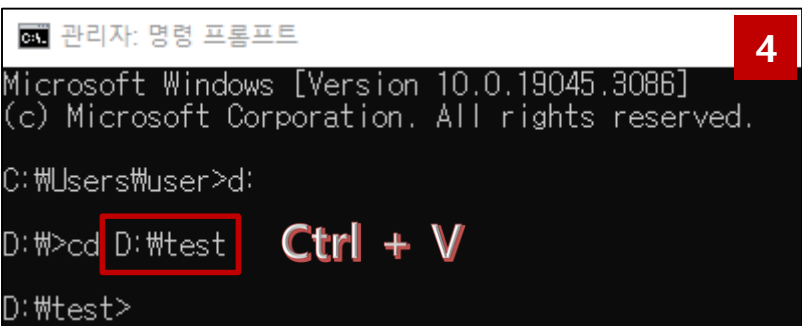
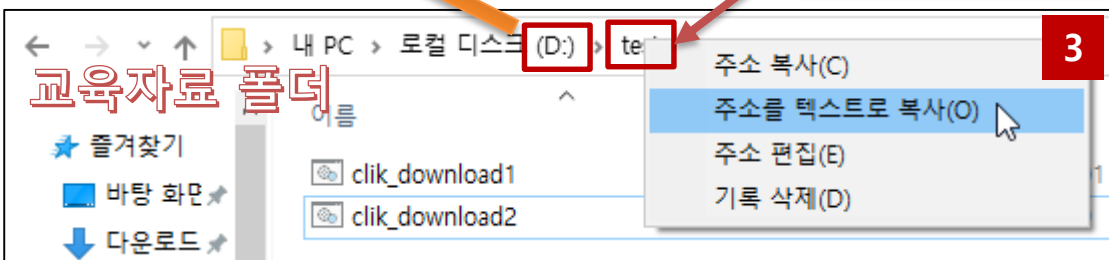
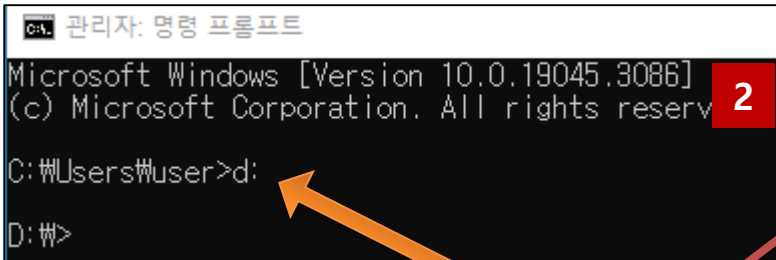
쿠키 저장 여부

다운로드 파일명 지정

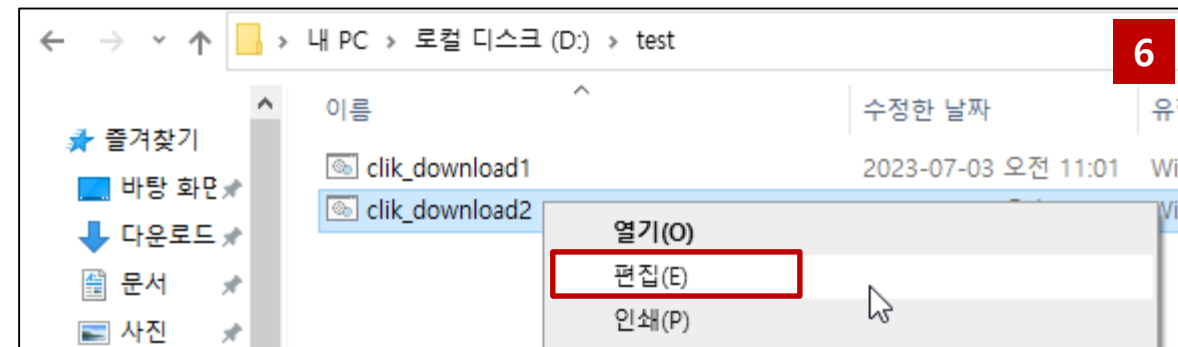
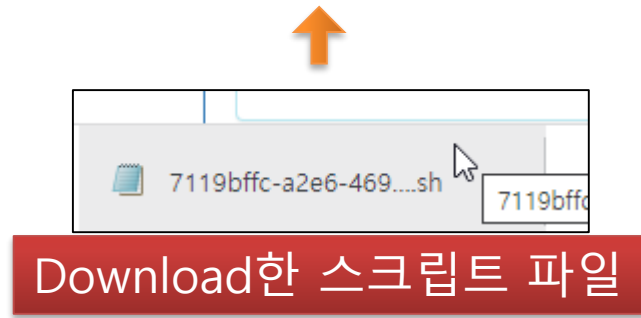
- [실습]
- 자료 Type : Forecast
 - 기관 : APCC
 - Model : SCOPS
 - 변수 : sst, t2m
 - 자료 기간: 2024년 7월

| MME Model – Script 실행

Windows의 경우 Windows Batch 파일 형식으로 편집 → 명령 프롬프트 (cmd) 에서 batch 실행



마우스 오른쪽 버튼



| MME Model – Script 실행

Windows의 경우 Windows Batch 파일 형식으로 편집 → 명령 프롬프트 (cmd) 에서 batch 실행

clik_download2 - Windows 메모장 7

파일(F) 편집(E) 서식(O) 보기(V) 도움말(H)

@ECHO OFF

```
set userid=userid
set password=password
set cookie_path=apcc.cookies
set cookie_option=--save-cookies=%cookie_path% --load-cookies=%cookie_path% --keep-session-cookies
set certificate_option=--no-check-certificate
```

실행 취소(U)

잘라내기(T)

복사(C)

붙여넣기(P)

삭제(D)

Ctrl + V

*clik_download2 - Windows 메모장 8

파일(F) 편집(E) 서식(O) 보기(V) 도움말(H)

@ECHO OFF

```
set userid=userid
set password=password
set cookie_path=apcc.cookies
set cookie_option=--save-cookies=%cookie_path% --load-cookies=%cookie_path% --keep-session-cookies
set certificate_option=--no-check-certificate
```

```
wget %cookie_option% --user=%userid% --password=%password% %certificate_option%
https://sdownload.apcc21.org/MODEL/FORECAST/APCC_SCOPS/JUL/2023/sst.nc -O FORECAST_APCC_SCOPS_JUL_2023_sst.nc
wget %cookie_option% --user=%userid% --password=%password% %certificate_option%
https://sdownload.apcc21.org/MODEL/FORECAST/APCC_SCOPS/JUL/2023/t2m.nc -O FORECAST_APCC_SCOPS_JUL_2023_t2m.nc
```

관리자: 명령 프롬프트 9

```
D:\test>clik_download2.bat
SYSTEM_WGETRC = c:/program1/wget/etc/wgetrc
syswgetrc = C:\Program Files (x86)\GnuWin32/etc/wgetrc
Cannot open cookies file `apcc.cookies': No such file or directory
--2023-07-05 10:24:34-- https://sdownload.apcc21.org/MODEL/FORECAST/APCC_SCOPS/JUL/2023/sst.nc
Resolving sdownload.apcc21.org... 10.200.111.213
Connecting to sdownload.apcc21.org|10.200.111.213|:443... connected.
WARNING: cannot verify sdownload.apcc21.org's certificate, issued by `CN=haproxyCA':
Unable to locally verify the issuer's authority.
WARNING: certificate common name `haproxySSL' doesn't match requested host name `sdownload.apcc21.org'.
HTTP request sent, awaiting response... 401 Unauthorized
Reusing existing connection to sdownload.apcc21.org:443.
HTTP request sent, awaiting response... 200 OK
length: 2545016 (2.4M) [application/x-netcdf]
Saving to: `FORECAST_APCC_SCOPS_JUL_2023_sst.nc'

100%[=====] 2,545,016 1.14M/s in 2.1s

2023-07-05 10:24:36 (1.14 MB/s) - `FORECAST_APCC_SCOPS_JUL_2023_sst.nc' saved [2545016/2545016]

SYSTEM_WGETRC = c:/program1/wget/etc/wgetrc
syswgetrc = C:\Program Files (x86)\GnuWin32/etc/wgetrc
--2023-07-05 10:24:36-- https://sdownload.apcc21.org/MODEL/FORECAST/APCC_SCOPS/JUL/2023/t2m.nc
Resolving sdownload.apcc21.org... 10.200.111.213
Connecting to sdownload.apcc21.org|10.200.111.213|:443... connected.
WARNING: cannot verify sdownload.apcc21.org's certificate, issued by `CN=haproxyCA':
Unable to locally verify the issuer's authority.
WARNING: certificate common name `haproxySSL' doesn't match requested host name `sdownload.apcc21.org'.
HTTP request sent, awaiting response... 200 OK
length: 2545016 (2.4M) [application/x-netcdf]
Saving to: `FORECAST_APCC_SCOPS_JUL_2023_t2m.nc'

100%[=====] 2,545,016 890K/s in 2.8s

2023-07-05 10:24:39 (890 KB/s) - `FORECAST_APCC_SCOPS_JUL_2023_t2m.nc' saved [2545016/2545016]
```

| High Resolution MME – Overview

고해상도 MME, MME Model

- 1 x 1 (deg) 해상도 MME
- 기타 사항은 저해상도 MME와 거의 동일
- wget 다운로드 기능만 제공
(다운로드 방법은 저해상도와 동일)


Dataset	Processing
MME-3MON	
MME-6MON	
MME-MODEL	
High Resolution MME	
BSISO	
CMIP5	

Overview
Download

APCC MME: Multi-Model Ensemble Forecast (High Resolution)

The APCC seasonal forecast is based on multi-model ensemble (MME) prediction system and disseminated to APEC member economies around 15th of every month. Currently, 15 operational centers and research institutes from 11 countries around the world participate in the APCC MME operational prediction system by routinely providing their predictions in the form of ensembles of global forecast fields. The APCC's real-time operational forecasts are issued in both deterministic (based on ensemble mean) and probabilistic (based on full set of ensemble members) forms and more detailed description of the methods is as follows.

- Deterministic MME Forecast**
The deterministic forecast is based on a simply average of bias-corrected ensemble means from each model with equal weight to create a multi-model forecast. The ensemble mean anomaly forecasts for each individual model is calculated by their own climatology from the hindcasts.
- Probabilistic MME Forecast**
The probabilistic forecast is based on an uncalibrated MME with model weights being proportional to the square root of ensemble size, and a Gaussian fitting method for the estimation of the tercile-based categorical probabilities, that is, the probability of below-normal (BN), near-normal (NN), and above-normal (AN) categories with respect to climatology (Min et al. 2009). The procedure for the probabilistic forecast consists of following two steps.
 - Estimate the individual model probabilities
The upper and lower terciles are determined separately for each model using their mean and standard deviation of hindcasts.



MME data download

```
url: https://download.apcc21.org/MME-HRES/[leadMonth]/[type]/[method]/[month]/[year]/[file name]
leadMonth: 3-MON, 6-MON
type: FORECAST
method: SCM, GAUS
month: JAN, FEB, MAR, APR, MAY, JUN, JUL, AUG, SEP, OCT, NOV, DEC
year: 2022, 2021,...
file name: [variable name].nc (prec.nc),
variable name : prec, slp, sst, t2m, t850, z500
```

wget https://download.apcc21.org/MME-HRES/3-MON/FORECAST/SCM/NOV/2022/prec.nc
 wget https://download.apcc21.org/MME-HRES/6-MON/FORECAST/GAUS/NOV/2022/prec.nc

Model data download

```
url: https://sdownload.apcc21.org/MODEL-HRES/[type]/[model]/[month]/[year]/[file name]
type: FORECAST, HINDCASTyyyy
model: APCC_SCOPS, BCC_CSM1.1M, BOM_ACCESS-S2, CMCC_SPS3.5, CWB_TCWB1Tv1.1, ECCS_CANSIPsv2.1, HMC_SL-AV,
KMA_GLOSEA6GC3.2, METFR_SYS8, MGO_MGOAM-2, NASA_GEOS-S2S-2.1, NCEP_CFSv2, PNU-RDA_CGCMv2.0, UKMO_GLOS
month: JAN, FEB, MAR, APR, MAY, JUN, JUL, AUG, SEP, OCT, NOV, DEC
year: FORECAST - 2022, 2021,...
HINDCAST - APCC(1983~2013), ECCS(1980~2020), NASA(1981~2016),
file name: [variable name].nc (prec.nc)
variable name : prec, slp, sst, t2m, t850, z500
```

wget --user=*userid* --password=*passwd* https://sdownload.apcc21.org/MODEL-HRES/FORECAST/APCC_SCOPS/NOV/2022/prec.nc
 wget --user=*userid* --password=*passwd* https://sdownload.apcc21.org/MODEL-HRES/HINDCAST2022/METFR_SYS8/NOV/1993/sst.nc
 wget --user=*userid* --password=*passwd* https://sdownload.apcc21.org/MODEL-HRES/HINDCAST2023/APCC_SCOPS/JAN/1983/prec.nc

| BSISO – Overview

여름철 계절내 진동 지수

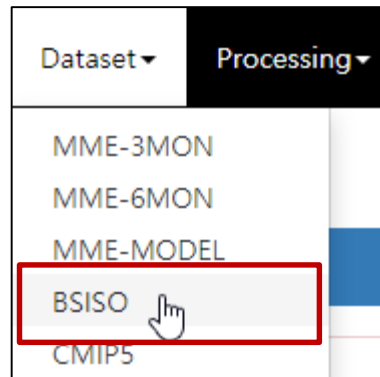
- Boreal Summer Intraseasonal Oscillation (BSISO)
- 5~10월 감시 및 예측정보 제공

감시정보

- Monitoring
- 5~10월 매일 제공

예측정보

- 세계기상기구 수치실험실무단의 협조를 받아 수치모델에 기반한 BSISO 예측정보 제공
- 4개 기관의 Model 예측정보 제공
- 모델 상세정보: www.apcc21.org/ser/bsisoModelDescription.do



Overview
Download

APCC BSISO (Boreal Summer Intraseasonal Oscillation) Index

The Boreal Summer Intraseasonal Oscillation (BSISO), one of the dominant phenomena over the Asian summer monsoon region, is characterized by northward/northeastward propagation over the Indian summer monsoon region and northward/northwestward propagation over the Western North Pacific-East Asian region, including equatorial eastward propagation.

The BSISO forecast activity has been initiated in 2013 with the goal of improving our ability to understand and forecast the BSISO based on numerical models in cooperation with the CAS/WCRP Working Group on Numerical Experimentation (WGNE) Madden Julian Oscillation (MJO) Task Force, and hosted at the APEC Climate Center (APCC).

The method to define the BSISO indices uses multivariate empirical orthogonal functions (MV-EOF) analysis of daily mean outgoing longwave radiation (OLR) and 850-hPa zonal wind (U850) anomalies over the Asian summer monsoon region (10S-40N, 40-160E) from 1 May to 31 October (Lee et al. 2013). The OLR and U850 anomalies are obtained by removing the slow annual cycle (mean and first three harmonics of climatological annual variation) as well as the effect of interannual variability by subtracting the running mean of the last 120 days as in Wheeler and Hendon (2004). The two anomaly fields are each normalized by their area averaged temporal standard deviation over the Asian summer monsoon region. After applying the MV-EOF on the normalized OLR and U850 anomalies, the first four MV-EOF modes are identified as important for representing the BSISO over the Asian summer monsoon region.

BSISO participating models

Table 1. Organization

Abbreviation for model	Center/Institution	Country	System name
BOM	Bureau of Meteorology	Australia	ACCESS-S2
CWB	Central Weather Bureau	Chinese Taipei	TCWB1T1.1
ECM	European Centre for Medium-Range Weather Forecasts	ECMWF council	ECMWF Ensemble Forecast
CFS	National Oceanic and Atmospheric Administration	United States of America	CFSv2
CFS	National Oceanic and Atmospheric Administration	United States of America	GFS

| BSISO – Download (Forecast)

자료 Type 선택

Type 1

FORECAST MONITORING

기관 선택

Institute

BOM CWB ECMWF NCEP

Model 선택

Model

POAMA ACCESS-S1 ACCESS-S2

기간 선택

Date

Year: Month: 05 06

파일 선택

2 Download historical data

<input checked="" type="checkbox"/> ALL	Initial date	File (Ascii)
<input checked="" type="checkbox"/>	20230601	20230601_BOMC_BSISO.20d.INDEX.LY
<input checked="" type="checkbox"/>	20230602	20230602_BOMC_BSISO.20d.INDEX.LY
<input checked="" type="checkbox"/>	20230603	20230603_BOMC_BSISO.20d.INDEX.LY
<input checked="" type="checkbox"/>	20230603	20230603_BOMC_BSISO.20d.INDEX.LY
<input checked="" type="checkbox"/>	20230604	20230604_BOMC_BSISO.20d.INDEX.LY
<input checked="" type="checkbox"/>	20230605	20230605_BOMC_BSISO.20d.INDEX.LY

모델의 전체 자료 다운로드

파일을 선택하여 직접 다운로드 가능

Select to request as download job.

Select to download script using wget.

[실습]

- 자료 Type : Forecast
- 기관 : BOM
- Model : ACCESS-S2
- 자료 기간: 2024년 7월 자료 전체

자료 요청 후 Job 생성

Jobs 3

Job ID: 64a264a020dd750006fe8f41

Member ▾

Processing ▾ 4

5

All	Queued	Running	Failed	Complete
				<input checked="" type="button" value="Download"/>
Job type	Submission date	End date	Status	
BSISO	2023-07-03 15:03:12	2023-07-03 15:03:19		

6

64a264a020dd750...zip

7

이름	압축 크기	원본 크기
FCST_BOM_ACCESS-S2_2023_20230601_BOMC_BSISO.20d.INDEX.LY	12,512	51,074
FCST_BOM_ACCESS-S2_2023_20230602_BOMC_BSISO.20d.INDEX.LY	12,477	51,074
FCST_BOM_ACCESS-S2_2023_20230603_BOMC_BSISO.20d.INDEX.LY	12,445	51,074
FCST_BOM_ACCESS-S2_2023_20230604_BOMC_BSISO.20d.INDEX.LY	12,382	51,074
FCST_BOM_ACCESS-S2_2023_20230605_BOMC_BSISO.20d.INDEX.LY	12,323	51,074
FCST_BOM_ACCESS-S2_2023_20230606_BOMC_BSISO.20d.INDEX.LY	12,317	51,074
FCST_BOM_ACCESS-S2_2023_20230607_BOMC_BSISO.20d.INDEX.LY	12,247	51,074
FCST_BOM_ACCESS-S2_2023_20230608_BOMC_BSISO.20d.INDEX.LY	12,327	51,074
FCST_BOM_ACCESS-S2_2023_20230609_BOMC_BSISO.20d.INDEX.LY	12,278	51,074

| Clipped CMIP5 – Overview

CMIP5

- Coupled Model Intercomparison Project
- 기후변화 시나리오

국가(주)별 분할

- 분할 별로 Code가 부여되어 있음
- 주 분할 국가: 미국, 캐나다, 러시아, 중국

Dataset ▾
Processing ▾

- MME-3MON
- MME-6MON
- MME-MODEL
- High Resolution MME
- BSISO
- CMIP5
- ERA5
- NCEP Reanalysis

Overview
Download

Clipped CMIP5 Data

The climate change scenario data provided on this website was generated in a manner to ensure user convenience when carrying out climate change impact assessments in the field of application. The data was obtained through the Earth System Grid Federation (ESGF) data portal (<https://esgf-node.llnl.gov/projects/cmip5/>). This data was originally generated through phase five of the Coupled Model Intercomparison Project (CMIP5) and is a collection of coordinated global-scale multi-model data. Table 1 indicates the national-level data that is currently available. This national-level data was clipped from the aforementioned global-scale multi-model data using the NetCDF Operation (NCO) library.

Table 1. Available national-level data based on clipped CMIP5 climate change scenario data.

Name	Code	xmin	ymin	xmax	ymax
Afghanistan	AF	60.48	29.38	74.88	38.48
Aland	AX	19.29	59.83	21.13	60.66
Albania	AL	19.28	39.64	21.06	42.66
Algeria	DZ	-8.67	18.96	11.98	37.09
American Samoa	AS	-171.09	-14.38	-169.42	-11.05
Andorra	AD	1.42	42.44	1.78	42.66
Angola	AO	11.68	-18.04	24.08	-4.38
Anguilla	AI	-63.43	18.17	-62.93	18.61
Antarctica	AQ	0.00	-90.00	360.00	-60.00
Antigua and Barbuda	AG	-62.35	16.93	-61.66	17.73
Argentina	AR	-73.58	-55.06	-53.59	-21.78
Armenia	AM	43.45	38.83	46.63	41.30
Aruba	AW	-70.06	12.41	-69.87	12.63

| Clipped CMIP5 – Download

CODE	NATION	NATION CODE	STATE	STATE CODE
<input type="radio"/> SK	Slovakia	SK		
<input type="radio"/> SI	Slovenia	SI		
<input type="radio"/> SB	Solomon Islands	SB		
<input type="radio"/> SO	Somalia	SO		
<input type="radio"/> ZA	South Africa	ZA		
<input type="radio"/> GS	South Georgia and the South Sandwich Isla	GS		
<input checked="" type="radio"/> KR	South Korea	KR		
<input type="radio"/> ES	Spain	ES		
<input type="radio"/> LK	Sri Lanka	LK		
<input type="radio"/> SD	Sudan	SD		
<input type="radio"/> SR	Suriname	SR		
<input type="radio"/> SJ	Svalbard and Jan Mayen	SJ		
<input type="radio"/> SZ	Swaziland	SZ		

Request Select to request as download job.
Create script Select to download script using wget.

자료 요청 후 Job 생성

jobs C Member ▾

Processing ▾ **My Jobs** CLIK API

All Queued Running Failed Complete				
Job type	Submission date	End date	Status	
CMIP5	2023-07-03 15:05:53	2023-07-03 15:05:53	Download	

NAME: CMIP5_2023-07-03-15:05:53

cmip5_daily_KR.zip 0.1/3.0GB, 21분 남음

| ERA5 – Overview

ERA5

- The fifth generation of ECMWF reanalysis
- ERA-Interim 대체
- Copernicus 제공

제공 자료

- Multi-level (Pressure level) : Monthly, Daily (6-hourly)
- Single-level (Surface level): Monthly, Daily (6-hourly), Hourly

Dataset ▾	Processing ▾
MME-3MON	
MME-6MON	
MME-MODEL	
High Resolution MME	
BSISO	
CMIP5	
ERA5	
NCEP Reanalysis	

Overview
Download

ECMWF ERA5

Description

General Info

- ERA5 is the fifth generation of ECMWF reanalysis for the global climate and weather for the past 4 to 7 decades. Currently, data is available from 1979. The ERA5 reanalysis will be completed by 2020, by when the dataset will cover the period from 1950 to present. ERA5 replaces the ERA-Interim reanalysis.
- ERA5 was produced using 4D-Var data assimilation in CY41R2 of ECMWF's Integrated Forecast System (IFS), with 137 hybrid sigma/pressure levels in the vertical, with the top level at 0.01 hPa. ERA5 includes information about uncertainties for all variables at reduced spatial and temporal resolution.
- Data has been regridded to a regular lat-lon grid of 0.25 degrees for the reanalysis and 0.5 degrees for the uncertainty estimate (0.5 and 1 degree respectively for ocean waves). Vertical resolution is 37 pressure levels from surface to 1 hPa.

Data Contributors

- ECMWF

Related Resource

- Copernicus Climate Change Service Climate Data Store (CDS)

Data Details

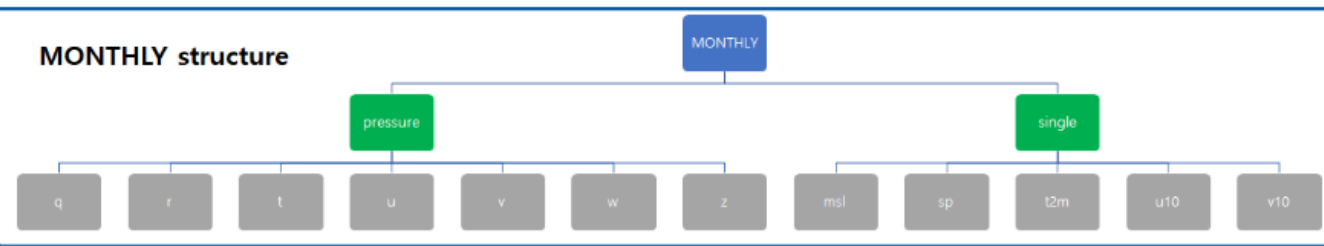
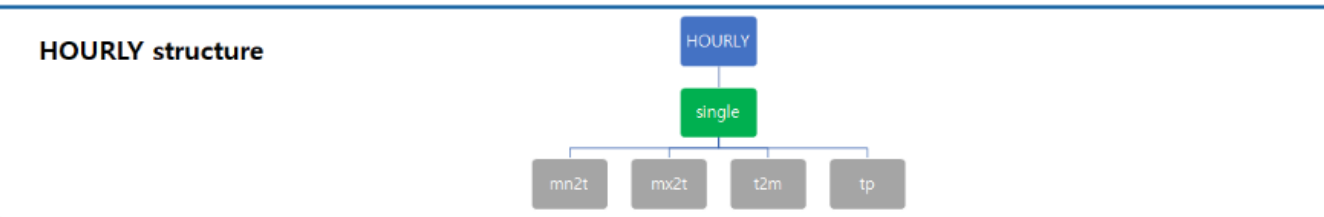
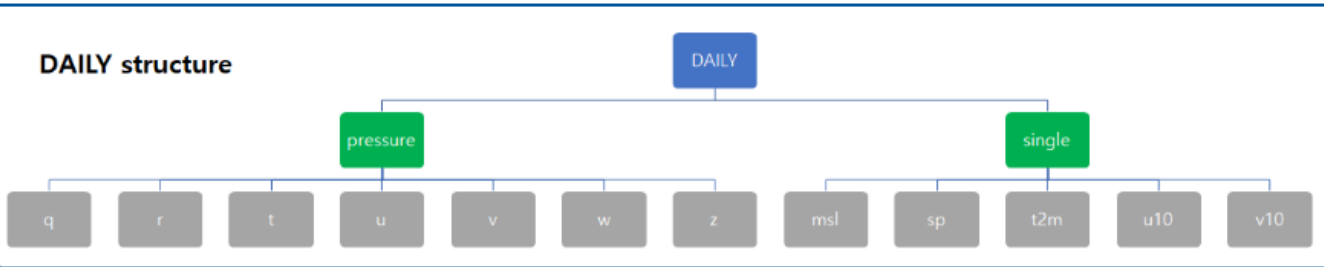
1. Daily

- Pressure level

Spatial resolution	0.25 X 0.25 (degree)
--------------------	----------------------

| ERA5 – Download

ERA5 자료 폴더 구조



Data structure
Wget download
CLIK API Download

```

url: https://download.apcc21.org/ERA5/[timestep]/[level]/[variable name]/[file name]
timestep: DAILY, MONTHLY, HOURLY
level: pressure, single
file name: [variable name]_YYYYMM.nc (DAILY, HOURLY),
            [variable name]_YYYY.nc (MONTHLY)
            
```

Sample:

```

wget https://download.apcc21.org/ERA5/DAILY/pressure/r/r_202012.nc
wget https://download.apcc21.org/ERA5/DAILY/single/t2m/t2m_202012.nc
wget https://download.apcc21.org/ERA5/HOURLY/single/tp/tp_202012.nc
wget https://download.apcc21.org/ERA5/MONTHLY/pressure/u/u_2021.nc
wget https://download.apcc21.org/ERA5/MONTHLY/single/sp/sp_2021.nc
            
```

Timestep	파일명 형식
DAILY	<i>variable_yyyyymm.nc</i>
HOURLY	<i>variable_yyyyymm.nc</i>
MONTHLY	<i>variable_yyyy.nc</i>

[실습]

- 자료 : ERA5
- Timestep : Monthly
- Level : surface
- Variable : t2m
- 기간 : 2024년

wget (--no-check-certificate) https://download.apcc21.org/*ERA5/timestep/level/variable/filename*

| NCEP Reanalysis – Overview

NCEP Reanalysis 1

- NCEP/NCAR Reanalysis 1
- NOAA Physical Sciences Laboratory 제공
- 제공 level: 17 Pressure level, 28 Sigma level, Surface level 등
- Timestep: Daily, Monthly

NCEP Reanalysis 2

- NCEP/DOE Reanalysis II
- NOAA Physical Sciences Laboratory 제공
- 제공 level: Pressure level, Sigma level, Single level 등
- Timestep: Daily, Monthly

Dataset ▾	Processing ▾
MME-3MON	
MME-6MON	
MME-MODEL	
High Resolution MME	
BSISO	
CMIP5	
ERA5	
NCEP Reanalysis	

Overview
Download

NCEP Reanalysis

NCEP Reanalysis 1
NCEP Reanalysis 2

1. Description

1.1. General Info

- The NCEP/NCAR Reanalysis 1 project is using a state-of-the-art analysis/forecast system to perform data assimilation using past data from 1948 to the present.
- A large subset of this data is available from PSD in its original 4 times daily format and as daily averages.
- However, the data from 1948-1957 is a little different, in the regular (non-Gaussian) gridded data. That data was done at 8 times daily in the model, because the inputs available in that era were available at 3Z, 9Z, 15Z, and 21Z, whereas the 4x daily data has been available at 0Z, 6Z, 12Z, and 18Z. These latter times were forecasted and the combined result for this early era is 8x daily.
- The local ingestion process took only the 0Z, 6Z, 12Z, and 18Z forecasted values, and thus only those were used to make the daily time series and monthly means here.

1.2. Terms of Data Use

1.2.1. Acknowledgement

- For dataset source, please cite: Kalnay et al., The NCEP/NCAR 40-year reanalysis project, Bull. Amer. Meteor. Soc., 77, 437-470, 1996.
- Please note: If you acquire NCEP Reanalysis data products from PSD, we ask that you acknowledge us in your use of the data. This may be done by including text such as NCEP Reanalysis data provided by the NOAA/OAR/ESRL PSD, Boulder, Colorado, USA, from their Web site at <https://www.esrl.noaa.gov/psd/> in any documents or publications using these data. We would also appreciate receiving a copy of the relevant publications. This will help PSD to justify keeping the NCEP Reanalysis data set freely available online in the future.

1.3. Data Contributors

- NOAA

1.4. Related Resource

- NCEP-NCAR Reanalysis 1

| NCEP Reanalysis 1 – Download

[NCEP Reanalysis 1] DAILY

```
url: https://download.apcc21.org/NCEP1/[timestep]/[level]/[variable name]/[file name]
timestep: DAILY
level: other_gauss, pressure, surface, surface_gauss
variable name: other_gauss -> dswrf.ntat, ulwrf.ntat, uswrf.ntat
                pressure   -> air, hgt, omega, rhum, shum, uwnd, vwnd
                surface    -> pres.sfc, slp
                surface_gauss -> air.2m, dlwrf.sfc, dswrf.sfc, lhtfl.sfc, prate.sfc, shtfl.sfc, shum.2m, tmax
file name: [variable name].gauss.YYYY.nc (other_gauss, surface_gauss),
           [variable name].YYYY.nc (pressure, surface)
```

Sample:

```
wget https://download.apcc21.org/NCEP1/DAILY/other_gauss/dswrf.ntat/dswrf.ntat.gauss.2022.nc
wget https://download.apcc21.org/NCEP1/DAILY/pressure/air/air.2022.nc
wget https://download.apcc21.org/NCEP1/DAILY/surface/pres.sfc/pres.sfc.2022.nc
wget https://download.apcc21.org/NCEP1/DAILY/surface_gauss/air.2m/air.2m.gauss.2022.nc
```

[NCEP Reanalysis 1] MONTHLY

```
url: https://download.apcc21.org/NCEP1/[timestep]/[level]/[file name]
timestep: MONTHLY
level: other_gauss, pressure, surface, surface_gauss
variable name: other_gauss -> dswrf.ntat, ulwrf.ntat, uswrf.ntat
                pressure   -> air, hgt, omega, rhum, shum, uwnd, vwnd
                surface    -> pres.sfc, slp
                surface_gauss -> air.2m, dlwrf.sfc, dswrf.sfc, lhtfl.sfc, prate.sfc, shtfl.sfc, shum.2m, tmax
file name: [variable name].mon.mean.nc
```

Sample:

```
wget https://download.apcc21.org/NCEP1/MONTHLY/other_gauss/dswrf.ntat.mon.mean.nc
wget https://download.apcc21.org/NCEP1/MONTHLY/pressure/air.mon.mean.nc
wget https://download.apcc21.org/NCEP1/MONTHLY/surface/pres.sfc.mon.mean.nc
wget https://download.apcc21.org/NCEP1/MONTHLY/surface_gauss/air.2m.mon.mean.nc
```

Timestep	파일명 형식
DAILY	<i>Variable.yyyy.nc (pressure, surface)</i> <i>Variable.gauss.yyyy.nc (other_gauss, surface gauss)</i>
MONTHLY	<i>Variable.mon.mean.nc</i>

[실습]
 - 자료 : NCEP1
 - Timestep : Monthly
 - Level : surface
 - Variable : slp

```
wget (--no-check-certificate) https://download.apcc21.org/NCEP1/DAILY/level/variable/filename
wget (--no-check-certificate) https://download.apcc21.org/NCEP1/MONTHLY/level/filename
```

| NCEP2 Reanalysis 2 – Download

[NCEP Reanalysis 2] DAILY

```
url: https://download.apcc21.org/NCEP2/[timestep]/[level]/[variable name]/[file name]
timestep: DAILY
level: gaussian_grid, pressure, surface
variable name: gaussian_grid -> air.2m, dlwrf.sfc, dsurf.ntat, dsurf.sfc, lhtfl.sfc, prate.sfc, pres.sfc, sh
                pressure      -> air, hgt, omega, rhum, uwnd, vwnd
                surface       -> mslp, pres.sfc
file name: [variable name].gauss.YYYY.nc (gaussian_grid),
           [variable name].YYYY.nc (pressure, surface)
```

Sample:

```
wget https://download.apcc21.org/NCEP2/DAILY/gaussian_grid/air.2m/air.2m.gauss.2022.nc
wget https://download.apcc21.org/NCEP2/DAILY/pressure/air/air.2022.nc
wget https://download.apcc21.org/NCEP2/DAILY/surface/pres.sfc/pres.sfc.2022.nc
```

[NCEP Reanalysis 2] MONTHLY

```
url: https://download.apcc21.org/NCEP2/[timestep]/[level]/[file name]
timestep: MONTHLY
level: gaussian_grid, pressure, surface
variable name: gaussian_grid -> air.2m, dlwrf.sfc, dsurf.ntat, dsurf.sfc, lhtfl.sfc, prate.sfc, pres.sfc, sh
                pressure      -> air, hgt, omega, rhum, uwnd, vwnd
                surface       -> mslp, pres.sfc
file name: [variable name].mon.mean.nc
```

Sample:

```
wget https://download.apcc21.org/NCEP2/MONTHLY/gaussian_grid/air.2m.mon.mean.nc
wget https://download.apcc21.org/NCEP2/MONTHLY/pressure/air.mon.mean.nc
wget https://download.apcc21.org/NCEP2/MONTHLY/surface/pres.sfc.mon.mean.nc
```

Timestep	파일명 형식
DAILY	<i>Variable.yyyy.nc (pressure, surface)</i> <i>Variable.gauss.yyyy.nc (gaussian_grid)</i>
MONTHLY	<i>Variable.mon.mean.nc</i>

[실습]

- 자료 : NCEP2
- Timestep : Monthly
- Level : surface
- Variable : mslp

wget (--no-check-certificate) https://download.apcc21.org/*NCEP2/DAILY/level/variable/filename*
 wget (--no-check-certificate) https://download.apcc21.org/*NCEP2/MONTHLY/level/filename*



2024 APCC 기후정보서비스 사용자 워크숍

APCC 기후서비스 통합 플랫폼 소개 및 활용

- 기후자료 처리서비스 (Clipping & Composite & Masking) 실습 -

Contents

학습목표

APCC 기후서비스 플랫폼에서 제공하는 기후자료 처리서비스를 사용할 수 있다.

APCC 기후서비스 통합플랫폼 I

| Overview - 기후자료 서비스

| 기후자료 추출(Clipping) 서비스

- 기후자료 추출 서비스 메뉴 구성
- Clipping 시작하기
- Clipping 실습 I, II

| 기후자료 합성(Composite) 서비스

- 기후자료 합성 서비스 메뉴 구성
- Composite 시작하기
- Composite 실습

| 지역정보 추출(Masking) 서비스

- 지역정보 추출 서비스 메뉴 구성
- Masking 시작하기

기후자료 처리서비스(Clipping/Composite/Masking) – Overview

자료추출(Clipping) 서비스

- 기후서비스 플랫폼 - Processing – Clipping
- 사용자가 설정한 특정 연월 / 지역 / 변수 등 원하는 조건의 값을 추출
- MME 및 15개 기관 개별모델 자료 제공

자료합성(Composite) 서비스

- 기후서비스 플랫폼 - Processing – Composite
- 사용자가 설정한 특정 연월 / 변수 등 원하는 조건의 값을 합성
- 연도별 예측/관측 자료 제공 → 예측/관측 자료 합성 결과 비교

지역정보 추출(Masking) 서비스

- 기후서비스 플랫폼 – Processing - Masking
- 공간정보 기술을 이용하여 보다 정밀한 지역의 기후자료를 추출
- 국가 별 공간정보 기술을 이용하여 보다 정밀한 지역의 기후자료를 추출

Benefit

- 자료처리를 위한 전산자원이 부족한 사용자에게 처리 자원 제공 (Cloud 환경)
- 기후자료 처리에 익숙하지 않은 사용자에게 편리한 웹 인터페이스 제공
- 다양한 파일 포맷 지원을 통한 결과 데이터 활용성 제고

자료 추출(Clipping)

자료 합성(Composite)

지역정보 추출(Masking)

자료추출(Clipping) 서비스 메뉴 구성

입력 메뉴

변수 / 모델 / 기간 등
자료 추출 조건 설정

MME Individual

Clipping - APCC MME

Notice : MME data is updated around the 20th of every month and may change depending on operational situation.

Lead Time

3-MON
 6-MON

Year / Month

2023 7

Methods

Deterministic
 Probabilistic

Period

Monthly
 Seasonal

Variables

prec slp sst t2m t850 z500

Clipping Area

Coordinates Region Country

0 90 360
-90

Global

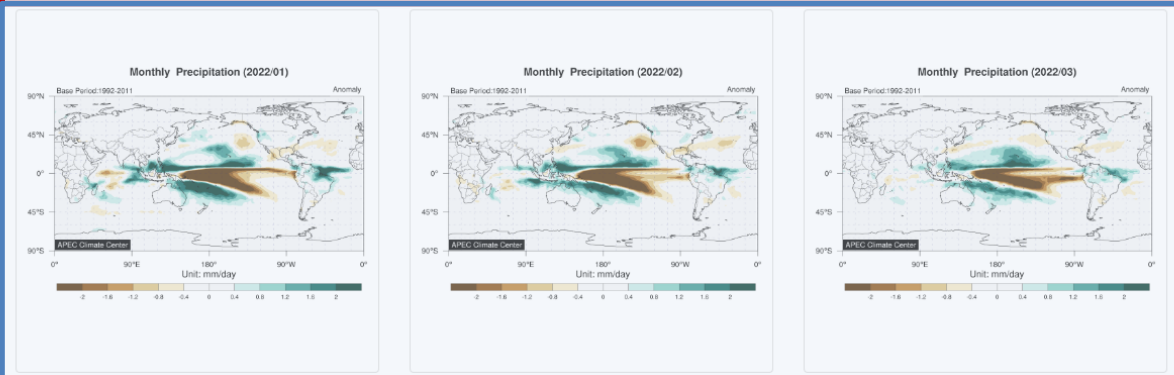
Choose Country

Select button to clip specific area.

Clip Area

출력 메뉴

.png, .nc, .xls 등
다양한 포맷의
결과물 제공



MME / Individual 메뉴

- MME
 - Lead Time
 - Year / Month
 - Method
 - Period
 - Variable
- Individual Model
 - Year / Month
 - Institute
 - Model
 - Variable

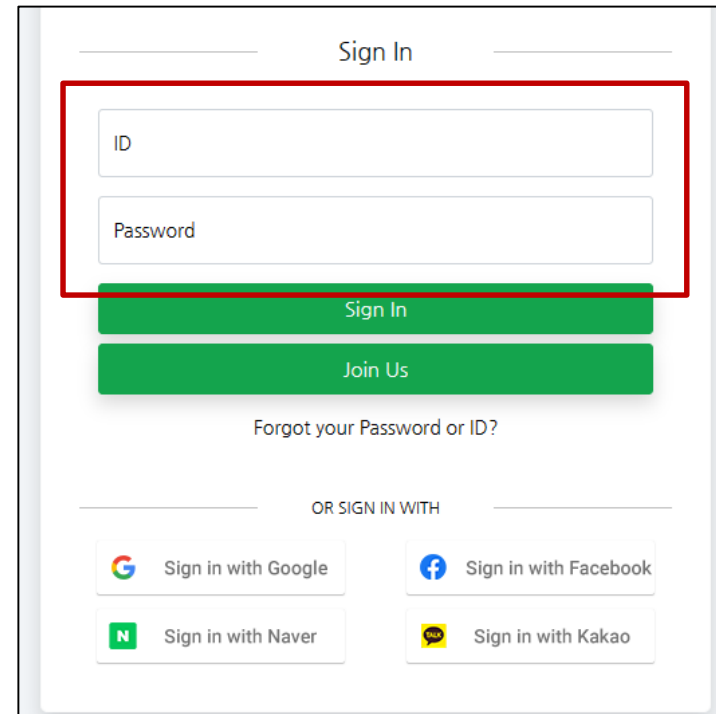
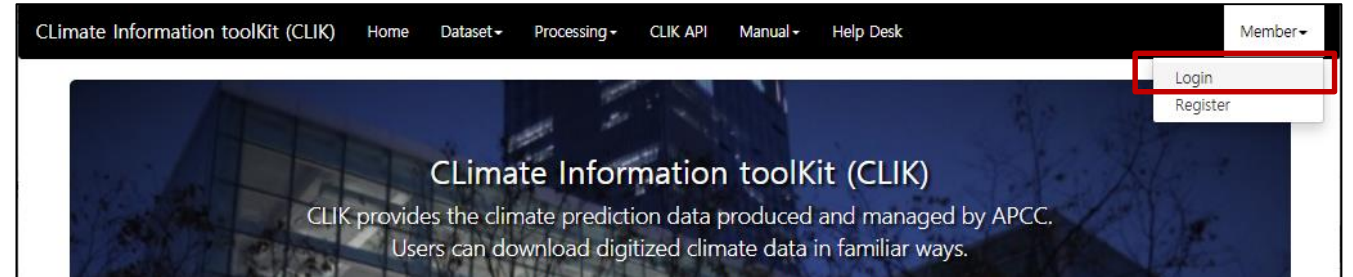
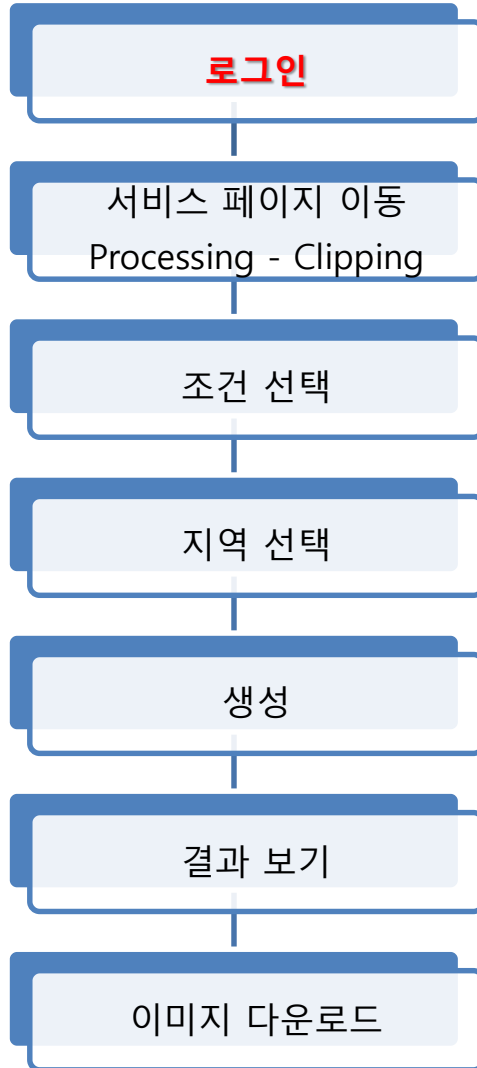
Clipping Area

- Coordinate
- Region
- Country

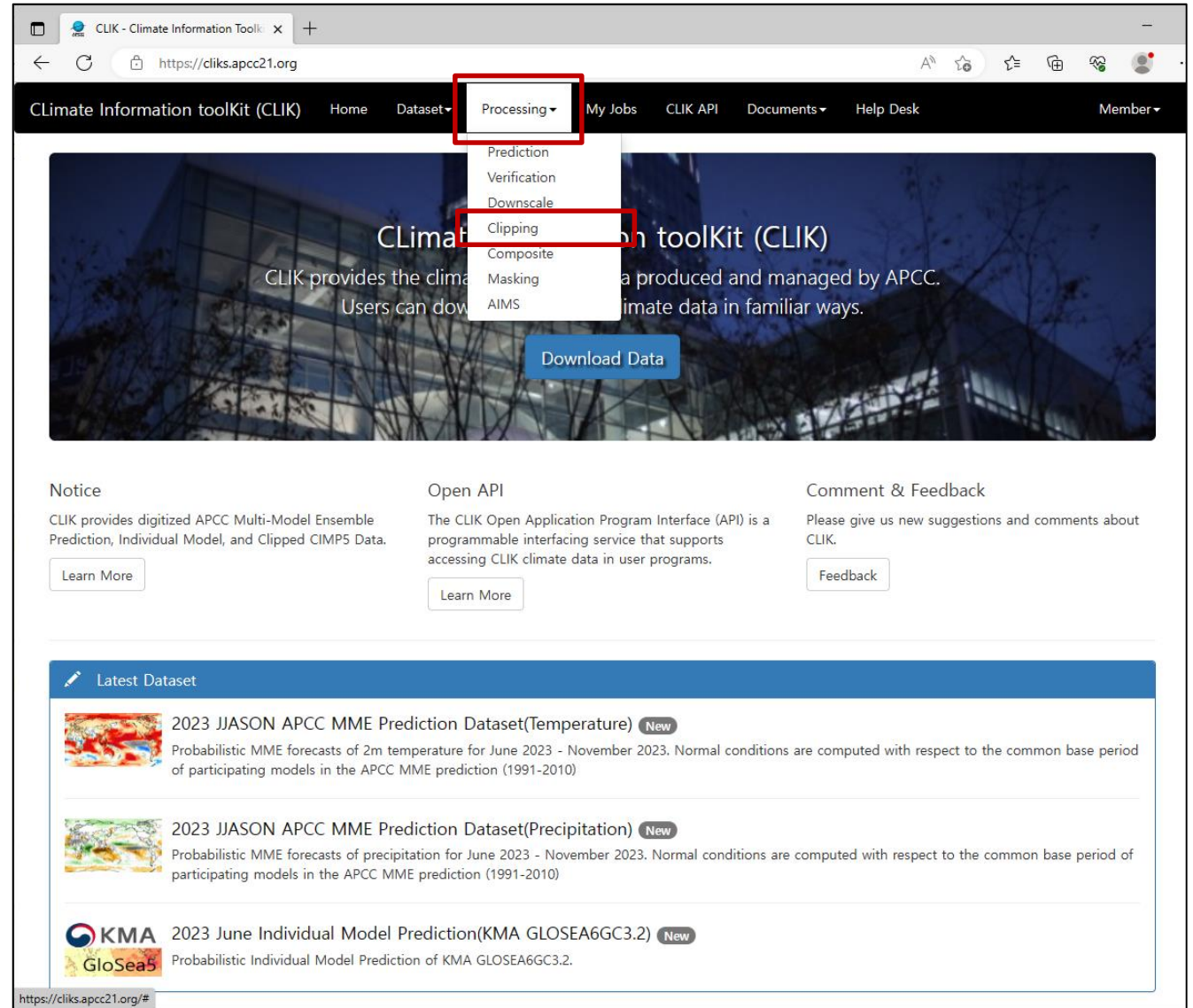
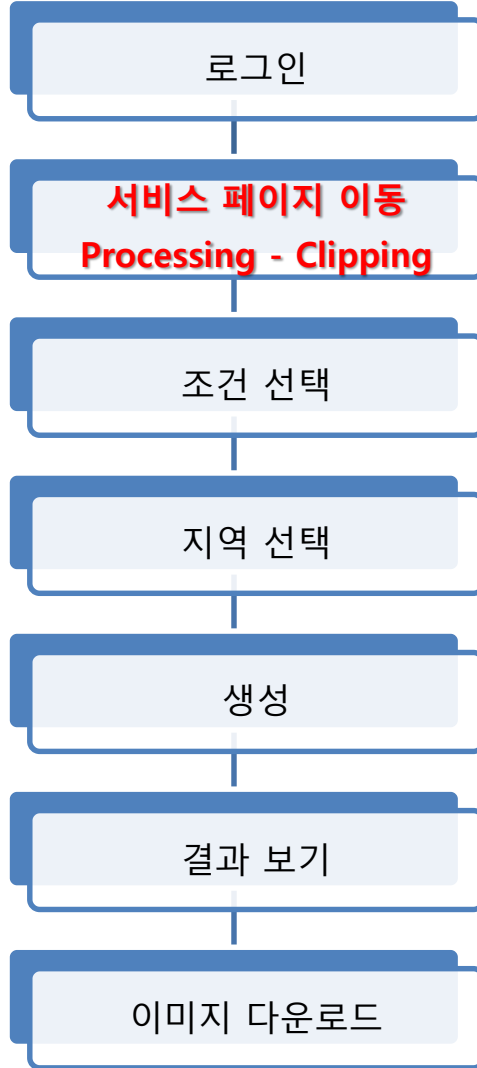
그림 선택

- 다른 이름으로 저장 → PNG

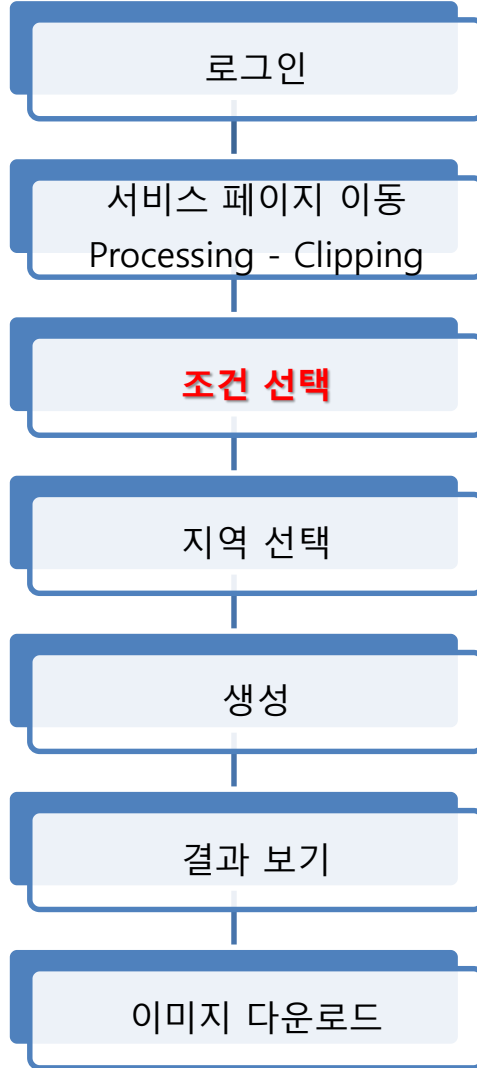
Clipping 시작하기 - 1 (로그인)



Clipping 시작하기 - 1 (서비스 페이지 이동)



Clipping 시작하기 - 3 (Clipping 조건 선택)



Climate Information toolkit (CLIK) Home Dataset Processing CLIK API Documents Help Desk Member

MME Individual

Clipping - APCC MME

Notice : MME data is updated around the 20th of every month and may change depending on operational situation.

Lead Time: 3-MON 6-MON

Year / Month: 2023 7

Methods: Deterministic Probabilistic

Period: Monthly Seasonal

Variables: prec slp sst t2m t850 z500

Clipping Area: Coordinates Region Country

Coordinates: 0 90 360 -90

Region: Global

Country: Choose Country

Select button to clip specific area.

Clip Area

Monthly Precipitation (2022/01)

Monthly Precipitation (2022/02)

Monthly Precipitation (2022/03)

Base Period: 1992-2011

Unit: mm/day

APCC Climate Center

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<https://cliks.apcc21.org>

Clipping 시작하기 - 4 (Clipping 지역 선택)



Climate Information toolkit (CLIK) Home Dataset Processing CLIK API Documents Help Desk Member

MME Individual

Clipping - APCC MME

Notice : MME data is updated around the 20th of every month and may change depending on operational situation.

Lead Time: 3-MON 6-MON

Year / Month: 2023 7

Methods: Deterministic Probabilistic

Period: Monthly Seasonal

Variables: prec slp sst t2m t850 z500

Clipping Area

Coordinates Region Country

Coordinates: 0 90 360 -90

Region: Global

Country: Choose Country

원하는 추출 좌표/지역 선택 Select button to clip specific area.

Clip Area

Monthly Precipitation (2022/01) Monthly Precipitation (2022/02) Monthly Precipitation (2022/03)

Base Period: 1992-2011 Anomaly Unit: mm/day

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<https://cliks.apcc21.org>

Clipping 시작하기 - 5 (결과 파일 생성)



Climate Information toolkit (CLIK) Home Dataset Processing CLIK API Documents Help Desk Member

MME Individual

Clipping - APCC MME

Notice : MME data is updated around the 20th of every month and may change depending on operational situation.

Lead Time: 3-MON 6-MON

Year / Month: 2023 7

Methods: Deterministic Probabilistic

Period: Monthly Seasonal

Variables: prec slp sst t2m t850 z500

Clipping Area: Coordinates Region Country

Coordinates: 0 90 -90 360

Region: Global

Country: Choose Country

Select to clip specific area.

Clip Area

Monthly Precipitation (2022/01) Anomaly

Monthly Precipitation (2022/02) Anomaly

Monthly Precipitation (2022/03) Anomaly

Base Period: 1992-2011

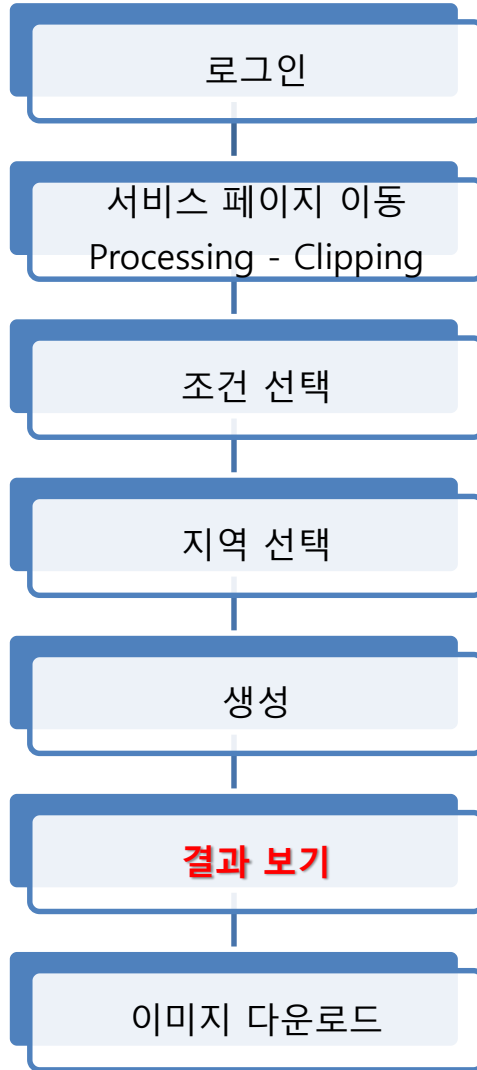
Unit: mm/day

APCC Climate Center

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<https://cliks.apcc21.org>

Clipping 시작하기 - 6 (결과 보기)



Climate Information toolkit (CLIK) Home Dataset Processing CLIK API Documents Help Desk Member

MME Individual

Clipping - APCC MME

Notice : MME data is updated around the 20th of every month and may change depending on operational situation.

Lead Time: 3-MON 6-MON

Year / Month: 2023 / 7

Methods: Deterministic Probabilistic

Period: Monthly Seasonal

Variables: prec slp sst t2m t850 z500

Clipping Area: Coordinates Region Country

Coordinates: 0, 90, -90, 360

Region: Global

Country: Choose Country

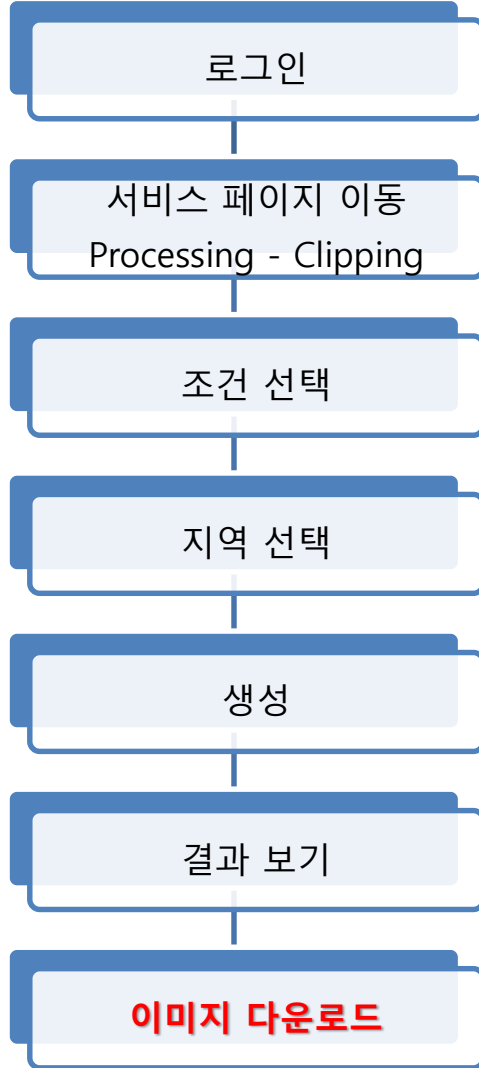
Select button to clip specific area.

Clip Area

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Clipping 시작하기 - 7 (이미지 다운로드)



The screenshot shows the CLIK web interface. On the left, there are control panels for 'Lead Time' (3-MON selected), 'Variables' (prec selected), and 'Clipping Area' (Coordinates selected). The main area features a world map titled 'Monthly Precipitation (2022/01)' with a color scale from -2 to 2 mm/day. A red box highlights the map, and a red arrow points to it with the text '원본 사이즈'. A context menu is open over the map, showing options like '새 탭에서 이미지 열기', '이미지 다운로드', and '이미지 주소를 복사'.

| Clipping 실습 I, II

Clipping 실습 시나리오 1.

- 2024년 6월의 MME – 3개월 자료에서 동아시아 지역의 자료를 추출한다.

Clipping 실습 시나리오 2.

- 2024년 6월 KMA - GLOSEA6GC3.2의 Sea Surface Temperature 변수에서 미국(USA) 지역의 자료를 추출한다. (개별모델-Individual)

자료합성(Composite) 서비스 메뉴 구성

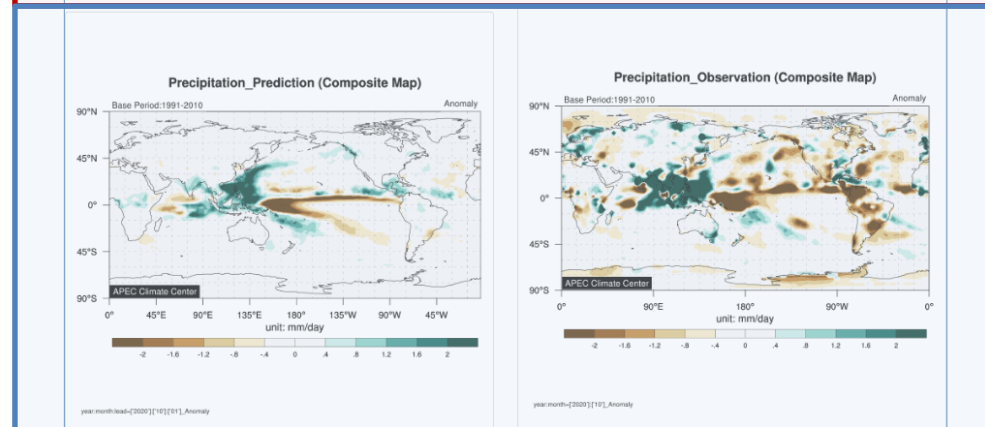
입력 메뉴

변수 / 모델 / 기간 등
자료 합성 조건 설정

The screenshot shows the 'Composite APCC MME' interface with two main sections: 'FORECAST' and 'OBSERVATION'.
FORECAST Section:
 - Variable: Radio buttons for 'prec', 'slp', 'sst', 't2m', 't850'.
 - Forecast Length: Radio buttons for '3-MON', '6-MON'.
 - Lead Time: Radio buttons for '01', '02', '03', '04', '05', '06'.
 - Date: A calendar grid for years 2015-2023 and months 01-12.
 - Button: 'Plot' with text 'Select button to plot data'.
OBSERVATION Section:
 - Variable: Radio buttons for 'prec', 'slp', 'sst', 't2m', 't850'.
 - Mean / Anomaly: Radio buttons for 'Mean', 'Anomaly'.
 - Climatology Period: 'Start' (199) and 'End' (202) dropdown menus.
 - Date: A calendar grid for years 2015-2023 and months 01-12.
 - Button: 'Plot' with text 'Select button to plot data'.

출력 메뉴

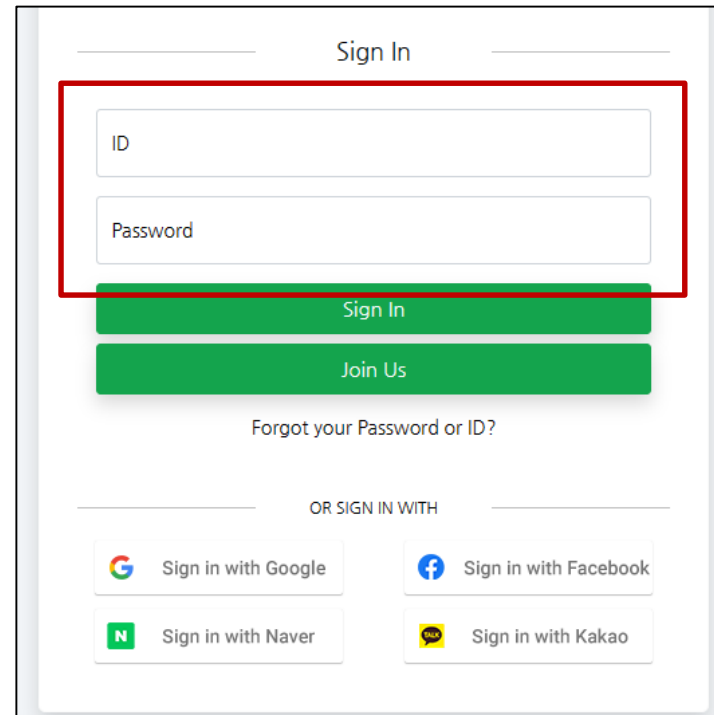
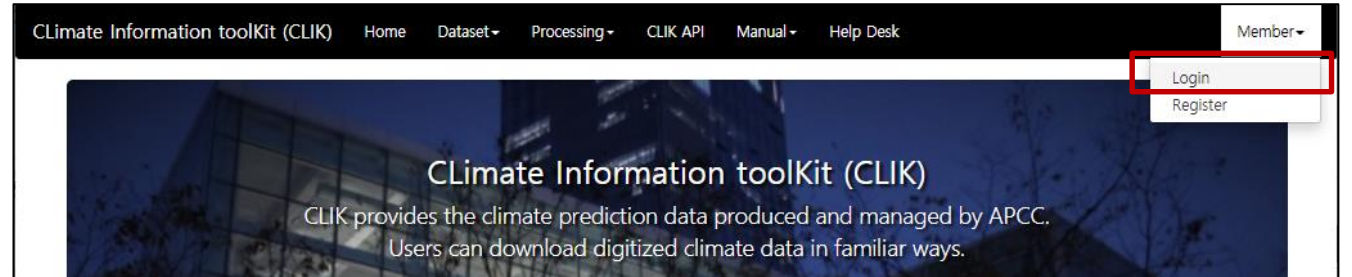
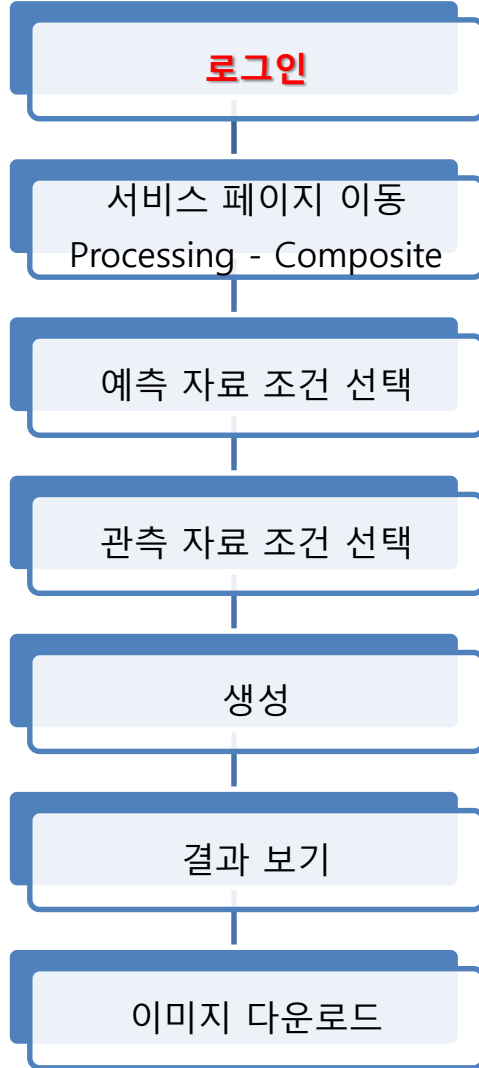
PNG 파일 출력 결과



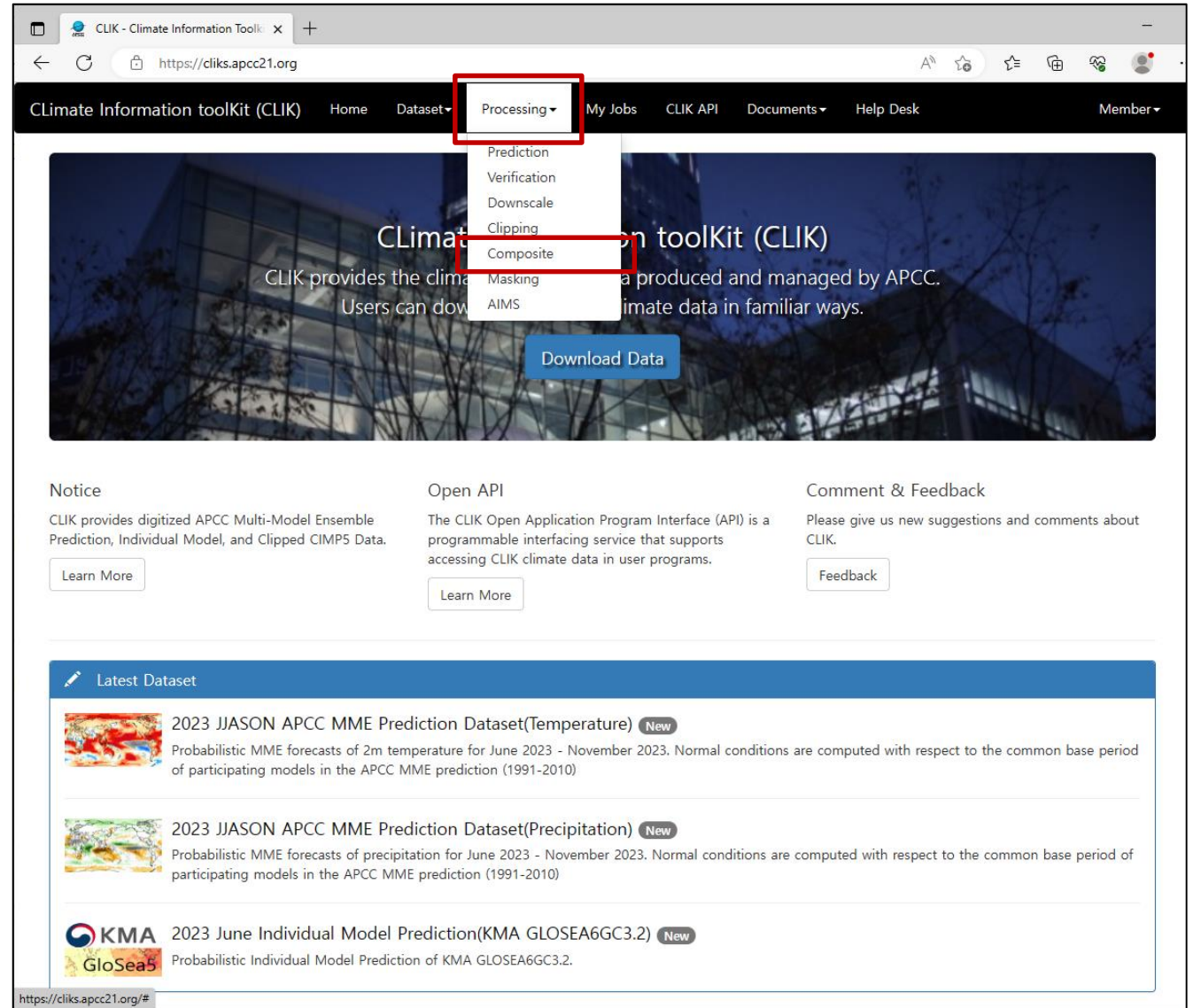
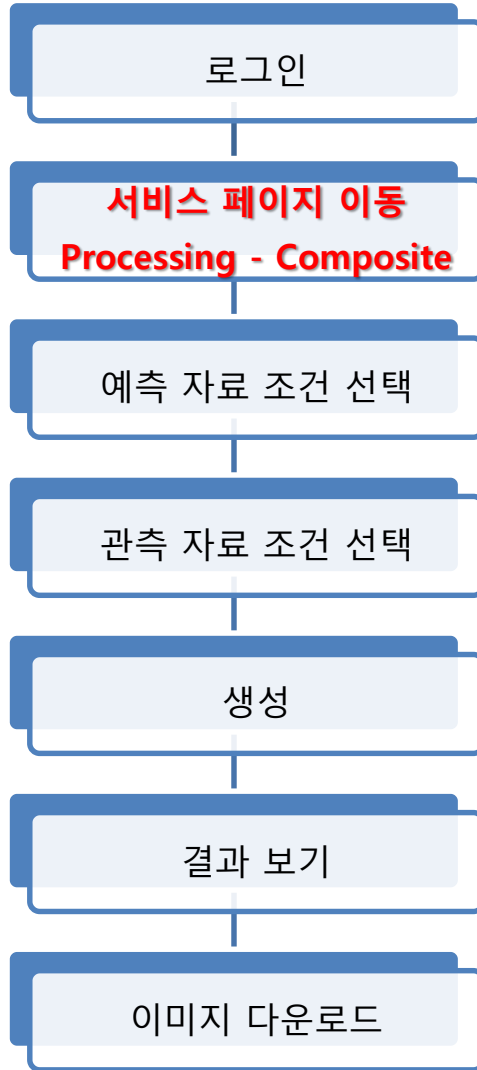
- 합성 조건 선택
 - **MME (Forecast)**
 - Variable
 - Forecast Length
 - Lead Time
 - **Observation Data**
 - Variable
 - Mean/Anomaly
 - Climatology Period

- 그림 선택 (클릭시 확대됨)
 - 다른 이름으로 저장 → PNG

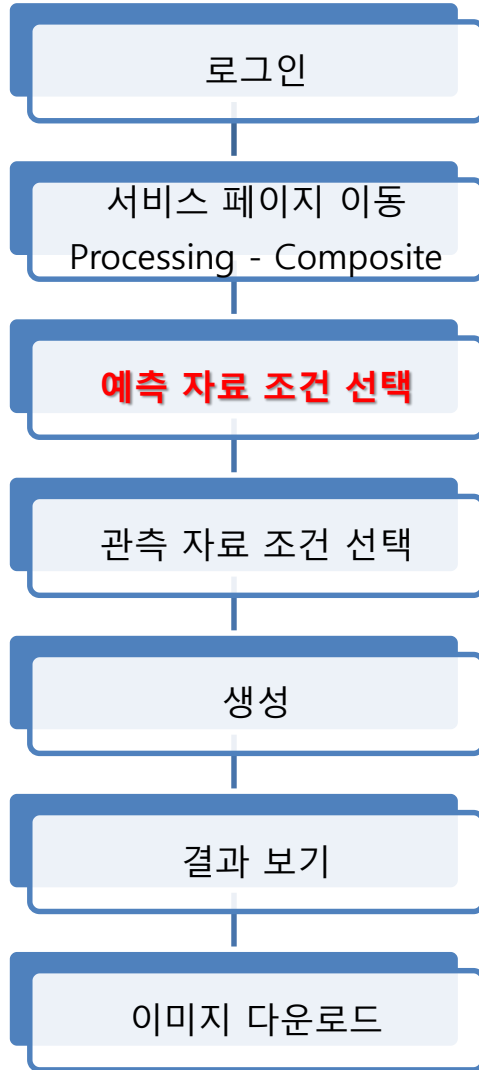
Composite 시작하기 - 1 (로그인)



Composite 시작하기 - 2 (Composite 페이지 접속)



Composite 시작하기 - 3 (예측 자료 조건 선택)



Composite APCC MME

FORECAST

Variable: prec slp sst t2m t850

Forecast Length: 3-MON 6-MON

Lead Time: 01 02 03 04 05 06

Date

	01	02	03	04	05	06	07	08	09	10	11	12
2023	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2022	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2021	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2020	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2019	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2018	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2017	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2016	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2015	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Select button to plot data

OBSERVATION

Variable: prec slp sst t2m t850

Mean / Anomaly: Mean Anomaly

Climatology Period

Start: 1991 End: 2020

Date

	01	02	03	04	05	06	07	08	09	10	11	12
2023	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2022	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2021	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2020	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2019	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2018	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2017	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2016	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2015	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2014	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Select button to plot data

Precipitation_Prediction (Composite Map)

Precipitation_Observation (Composite Map)

Composite 시작하기 - 4 (관측 자료 조건 선택)



Composite APCC MME

FORECAST

Variable: prec slp sst t2m t850

Forecast Length: 3-MON 6-MON

Lead Time: 01 02 03 04 05 06

Date

	01	02	03	04	05	06	07	08	09	10	11	12
2023	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2022	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2021	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2020	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2019	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2018	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2017	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2016	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2015	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Select button to plot data

Precipitation_Prediction (Composite Map)

OBSERVATION

Variable: prec slp sst t2m t850

Mean / Anomaly: Mean Anomaly

Climatology Period

Start: 1991 End: 2020

Date

	01	02	03	04	05	06	07	08	09	10	11	12
2023	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2022	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2021	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2020	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2019	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2018	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2017	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2016	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2015	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2014	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Select button to plot data

Precipitation_Observation (Composite Map)

Composite 시작하기 - 5 (결과 파일 생성)



Composite APCC MME

FORECAST

Variable: prec slp sst t2m t850

Forecast Length: 3-MON 6-MON

Lead Time: 01 02 03 04 05 06

Date

	01	02	03	04	05	06	07	08	09	10	11	12
2023	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2022	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2021	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2020	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2019	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2018	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2017	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2016	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2015	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Plot Select button to plot data

Precipitation_Prediction (Composite Map)

Base Period:1991-2010 Anomaly

OBSERVATION

Variable: prec slp sst t2m t850

Mean / Anomaly: Mean Anomaly

Climatology Period

Start: 1991 End: 2020

Date

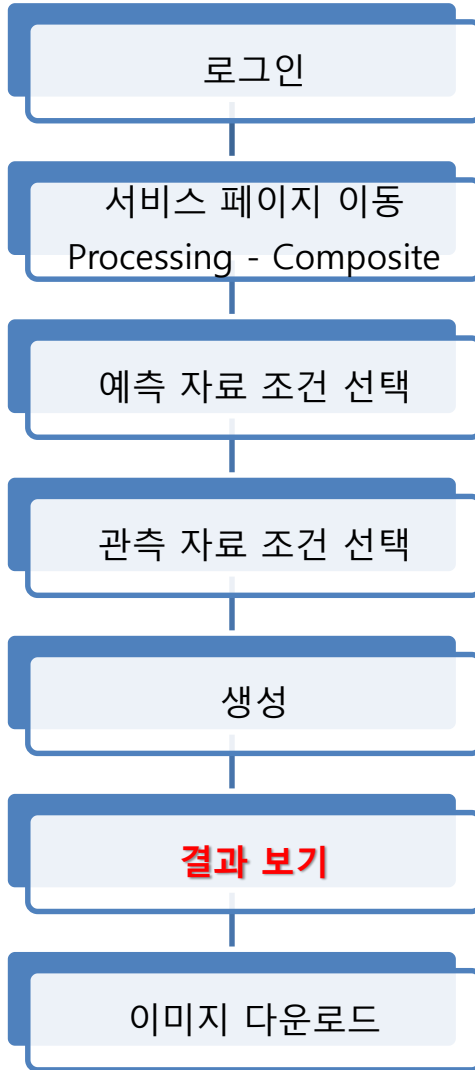
	01	02	03	04	05	06	07	08	09	10	11	12
2023	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2022	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2021	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2020	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2019	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2018	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2017	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2016	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2015	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2014	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Plot Select button to plot data

Precipitation_Observation (Composite Map)

Base Period:1991-2010 Anomaly

Composite 시작하기 - 6 (결과 보기)



Date

	01	02	03	04	05	06	07	08	09	10	11	12
2023	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
2022	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2021	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2020	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2019	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2018	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2017	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2016	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2015	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Plot Select button to plot data

Date

	01	02	03	04	05	06	07	08	09	10	11	12
2023	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>							
2022	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2021	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2020	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2019	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2018	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2017	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2016	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2015	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2014	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Plot Select button to plot data

Precipitation_Prediction (Composite Map)

unit: mm/day

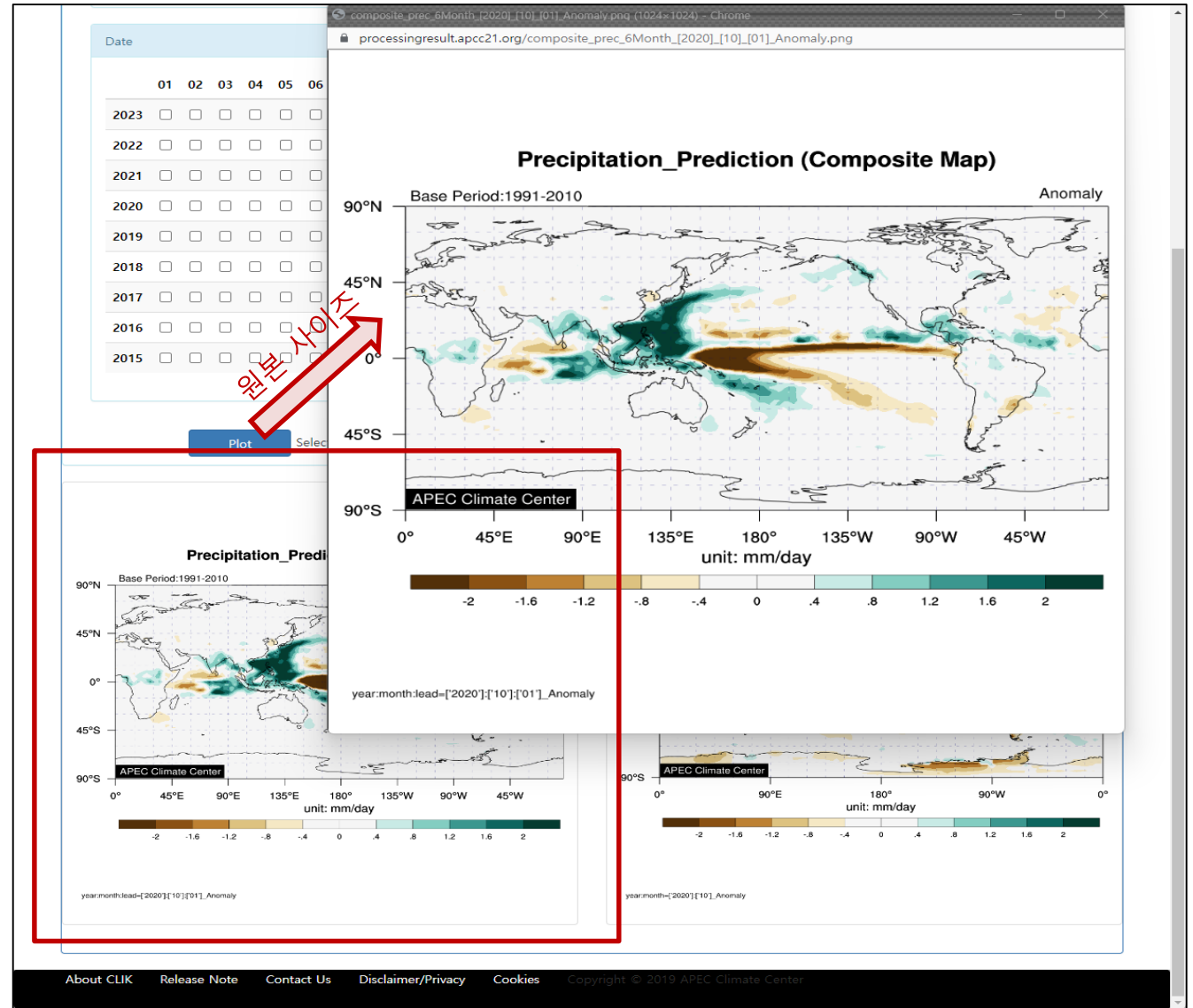
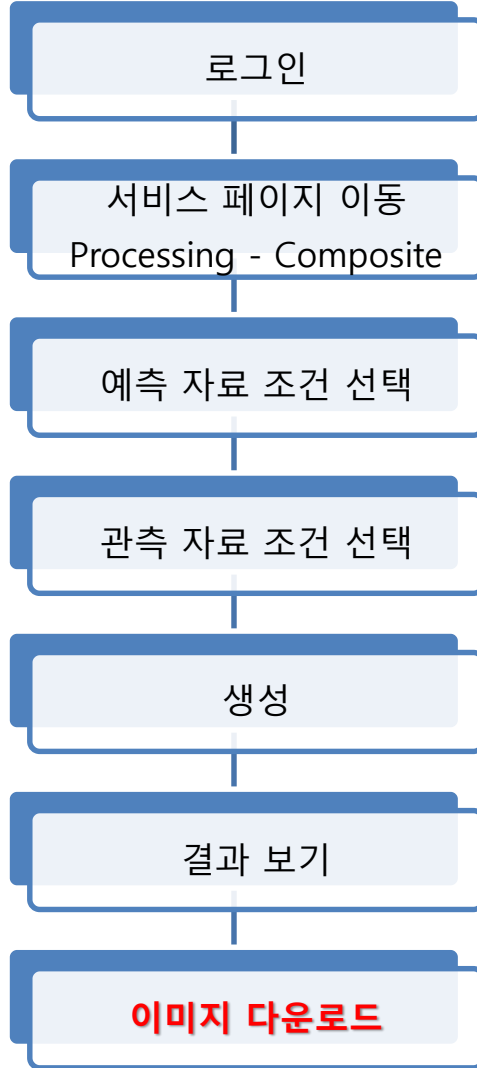
year:month=[2020][10][01]_Anomaly

Precipitation_Observation (Composite Map)

unit: mm/day

year:month=[2020][10]_Anomaly

Composite 시작하기 - 7 (결과 이미지 클릭)



| Composite 실습 |

Composite 실습 시나리오

- 2015 ~ 2020년 8월의 예측자료 (Precipitation – MME 6Month)를 합성하여 Observation 자료와 비교한다.

지역정보 추출(Masking) 서비스 메뉴 구성

입력 메뉴
 변수 / 기간 등
 지역 정보 추출 조건
 설정

Masking APCC MME

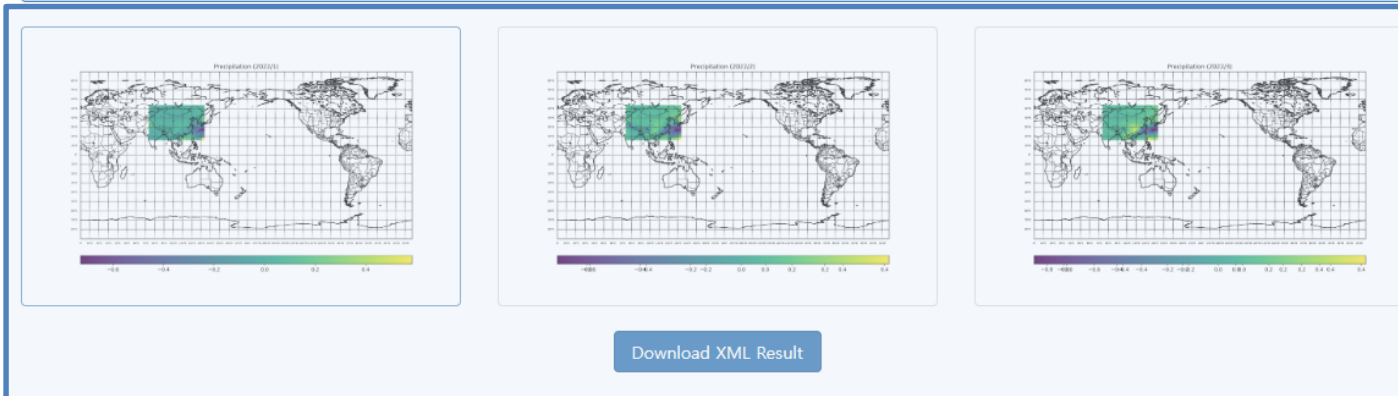
Notice : MME data is updated around the 20th of every month and may change depending on operational situation.

Lead Time <input checked="" type="radio"/> 3-MON <input type="radio"/> 6-MON	Year / Month 2023 7	Methods <input checked="" type="radio"/> Deterministic <input type="radio"/> Probabilistic	Period <input checked="" type="radio"/> Monthly <input type="radio"/> Seasonal
Variables <input checked="" type="radio"/> prec <input type="radio"/> slp <input type="radio"/> sst <input type="radio"/> t2m <input type="radio"/> t850 <input type="radio"/> z500			
Masking Option Masking Area(Country): Choose Country Masking Operator: Point in Polygon Distance(Expanded MBR): 2.5			

[Plot](#)

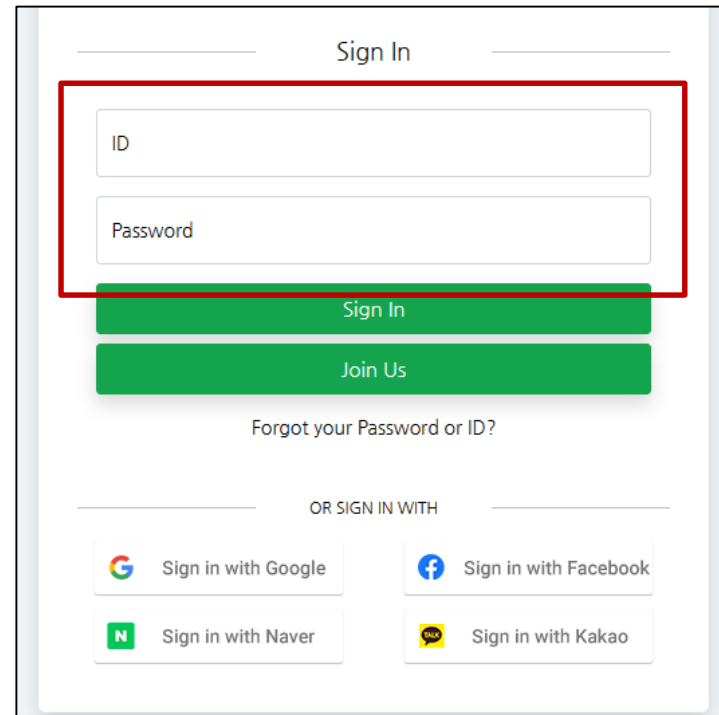
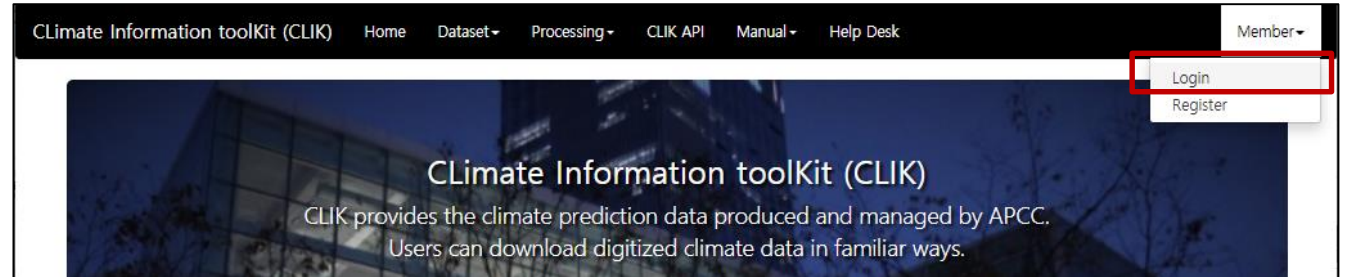
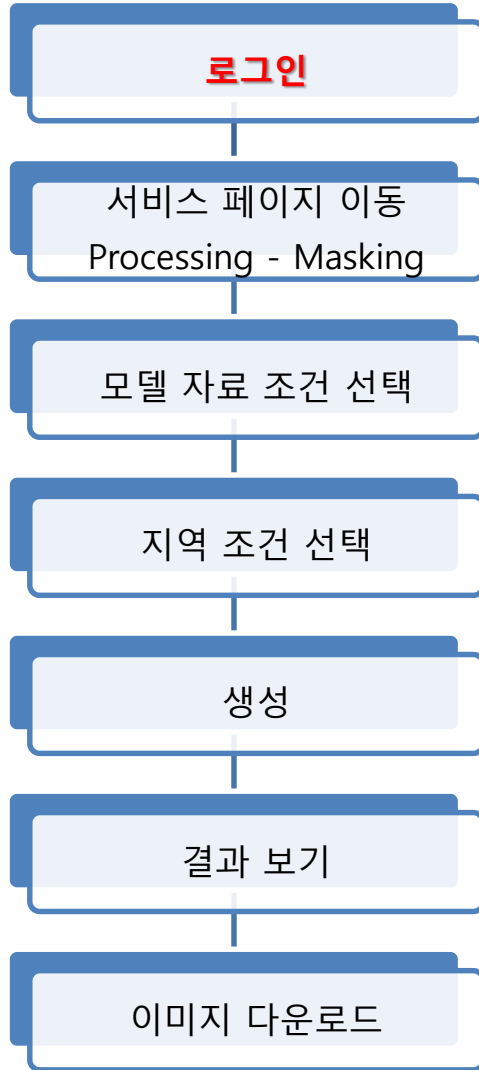
- **추출 조건 선택**
 - Lead Time
 - Year Month
 - Method
 - Period
 - Variable
- **Masking Option 선택**
 - Masking Area
 - Masking Operator
 - Distance

출력 메뉴
 PNG 파일 출력 결과

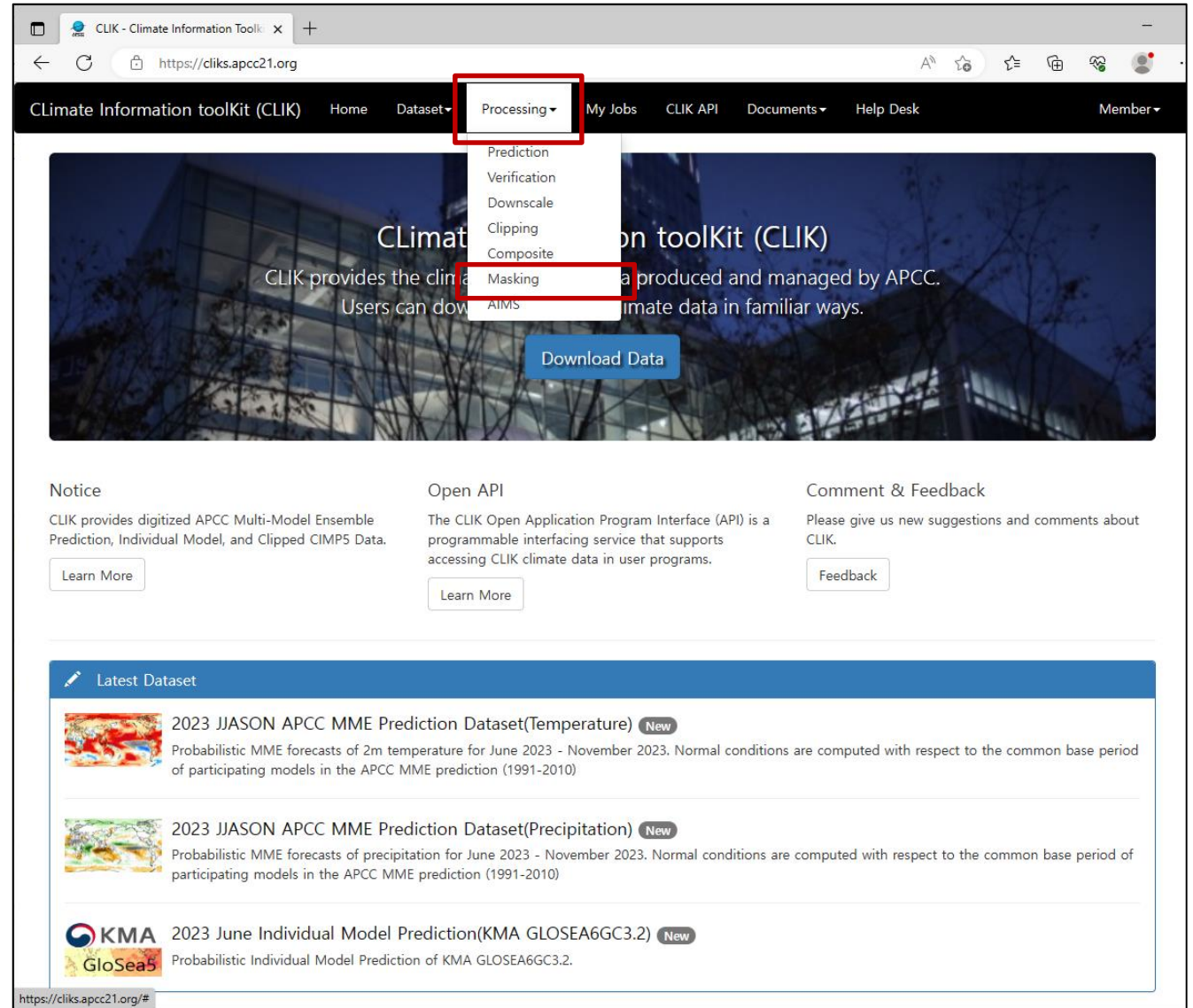
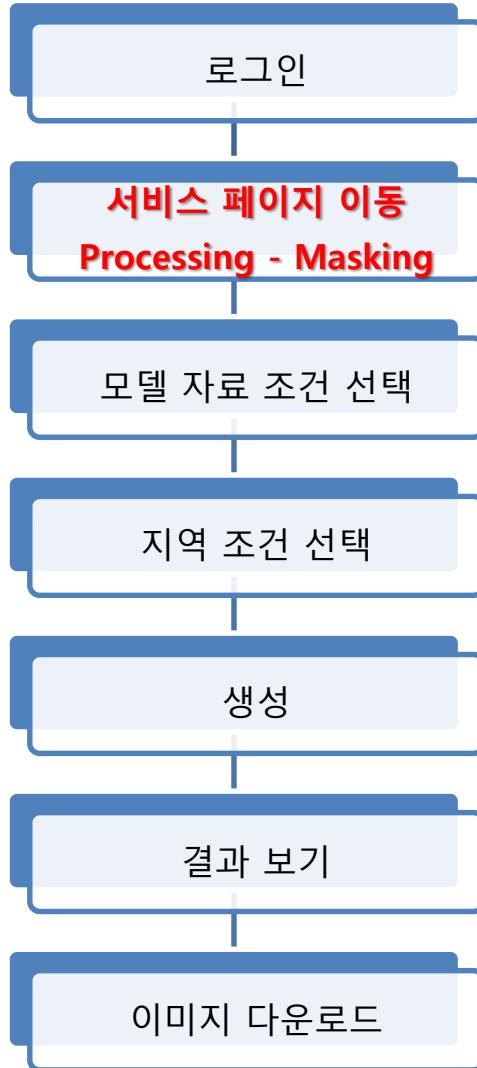


- 그림 선택 (클릭시 확대됨)
- 다른 이름으로 저장 → PNG

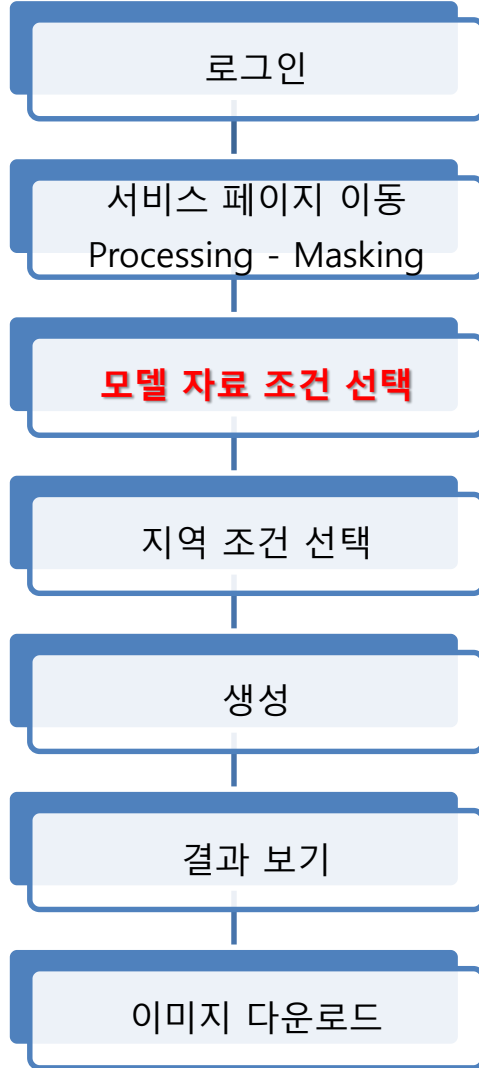
Masking 시작하기 - 1 (로그인)



Masking 시작하기 - 2 (서비스 페이지 이동)



Masking 시작하기 - 3 (추출할 모델 자료 조건 선택)



Climate Information toolkit (CLIK) Home Dataset Processing CLIK API Documents Help Desk Member

Masking APCC MME

Notice : MME data is updated around the 20th of every month and may change depending on operational situation.

Lead Time: 3-MON 6-MON

Year / Month: 2023 7

Methods: Deterministic Probabilistic

Period: Monthly Seasonal

Variables: prec slp sst t2m t850 z500

Masking Option

Masking Area(Country): Choose Country

Masking Operator: Point in Polygon

Distance(Expanded MBR): 2.5

Plot

Download XML Result

Masking 시작하기 - 4 (추출할 지역 조건 선택-1)



Climate Information toolkit (CLIK) Home Dataset Processing CLIK API Documents Help Desk Member

Masking APCC MME

Notice : MME data is updated around the 20th of every month and may change depending on operational situation.

Lead Time: 3-MON 6-MON

Year / Month: 2023 7

Methods: Deterministic Probabilistic

Period: Monthly Seasonal

Variables: prec slp sst t2m t850 z500

Masking Option

Masking Area(Country): Choose Country

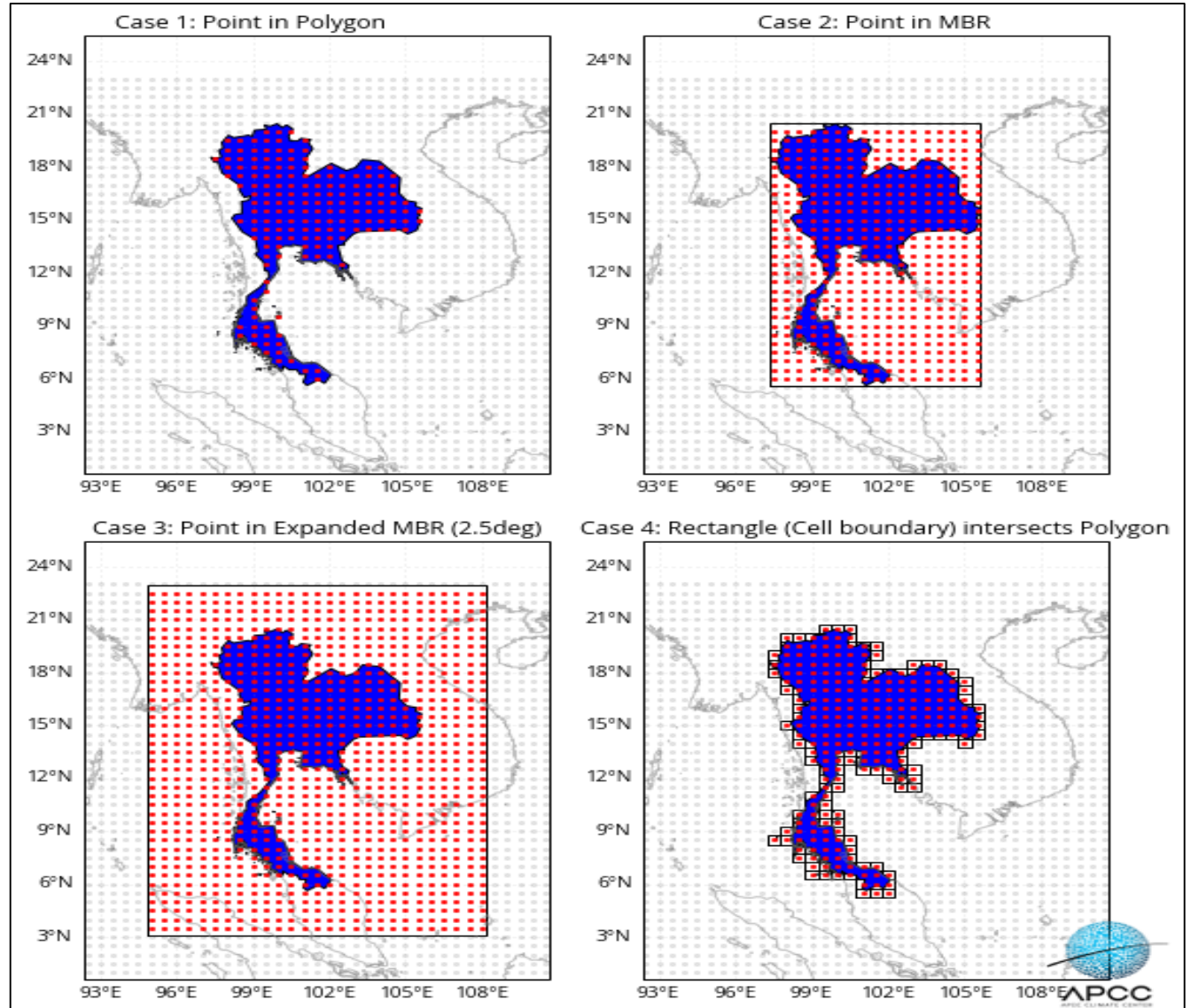
Masking Operator: Point in Polygon

Distance(Expanded MBR): 2.5

Plot

Download XML Result

Masking 시작하기 - 4 (추출할 지역 조건 선택-2)



Masking 시작하기 - 5 (결과 파일 생성)



Climate Information toolkit (CLIK) Home Dataset Processing CLIK API Documents Help Desk Member

Masking APCC MME

Notice: MME data is updated around the 20th of every month and may change depending on operational situation.

Lead Time: 3-MON 6-MON

Year / Month: 2023 7

Methods: Deterministic Probabilistic

Period: Monthly Seasonal

Variables: prec slp sst t2m t850 z500

Masking Option:

Masking Area(Country): Choose Country

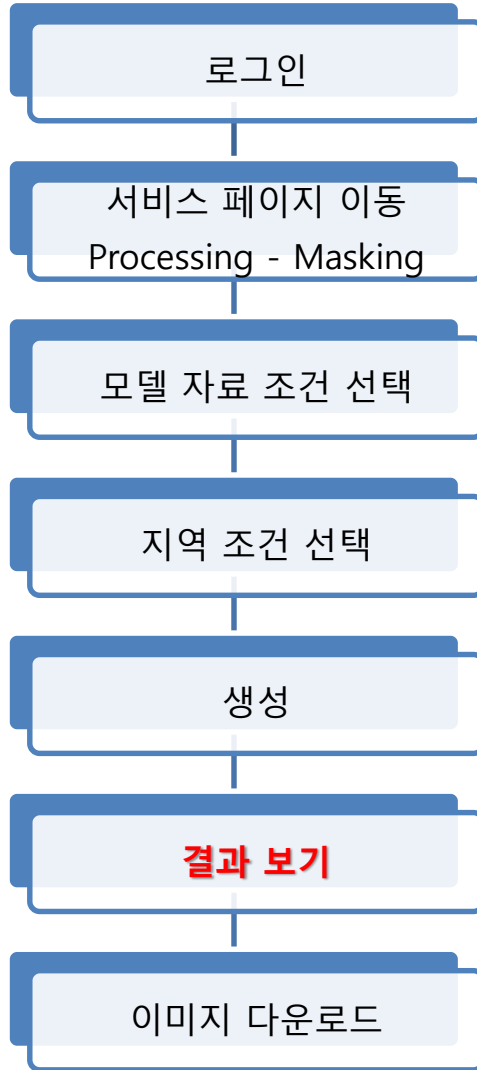
Masking Operator: Point in Polygon

Distance(Expanded MBR): 2.5

Plot

Download XML Result

Masking 시작하기 - 6 (결과 보기)



Climate Information toolkit (CLIK) Home Dataset Processing CLIK API Documents Help Desk Member

Masking APCC MME

Notice: MME data is updated around the 20th of every month and may change depending on operational situation.

Lead Time: 3-MON 6-MON

Year / Month: 2023 7

Methods: Deterministic Probabilistic

Period: Monthly Seasonal

Variables: prec slp sst t2m t850 z500

Masking Option:

Masking Area(Country): Choose Country

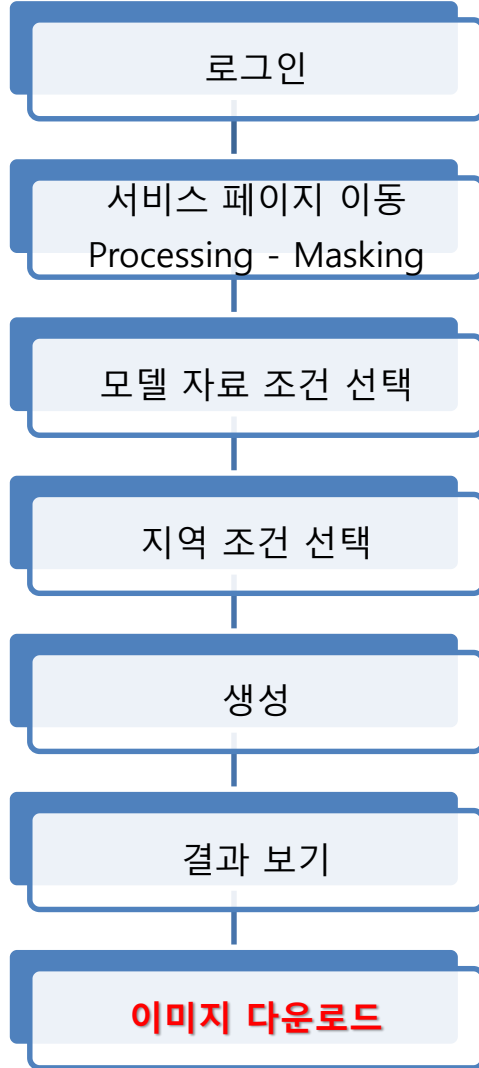
Masking Operator: Point in Polygon

Distance(Expanded MBR): 2.5

Plot

Download XML Result

Masking 시작하기 - 7 (결과 이미지 클릭)



The screenshot shows the 'Masking APCC MME' interface. On the left, there are settings for 'Lead Time' (3-MON selected), 'Variables' (prec selected), and 'Masking Option' (Masking Area(Country) dropdown). On the right, a world map displays 'Precipitation (2022/1)' with a color scale from -0.6 to 0.2. A red arrow points to a highlighted area in East Asia, labeled '일본 사이즈'. A 'Download XML Result' button is visible at the bottom.

| Panoply Data Viewer 설치 안내

실습용 프로그램 설치 (1)


- Panoply Data Viewer를 실행하기 위한 환경 (Java 환경) 설치
- 파일명 : [OpenJDK17U-jdk_x64_windows_hotspot_17.0.7_7.msi](#) (159MB)
- Windows 탐색기에서 해당 파일 실행 후 설치 (별도 추가 설정 없이 설치 진행)

실습용 프로그램 설치 (2)

- 파일명 : [PanoplyWin-5.2.8.zip](#) (41.5MB)
- 압축 해제 후 PanoplyWin 폴더의 Panoply.exe 실행

Panoply Data Viewer

- Panoply란?
 - NASA에서 개발한 교육 및 연구용 데이터 시각화 도구
 - NetCDF, HDF 및 GRIB 형식의 데이터 지원
 - 기후 연구 및 지구 과학에서 널리 사용
 - 데이터를 쉽게 이해하고 해석할 수 있도록 도와주는 도구
 - 데이터 형식과 기후 과학에 대한 기본적인 이해가 필요
- Panoply 주요 기능
 - 데이터를 다양한 방식으로 시각화 가능
 - 지도 투영에 데이터를 표시, Plot을 생성
 - 사용자는 데이터의 다양한 측면을 슬라이스 가능
 - 데이터의 구성 요소 확인 가능



National Aeronautics and Space Administration
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Goddard Space Flight Center
Sciences and Exploration Directorate
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Panoply Data Viewer

Download Panoply
Panoply requires a computer with **Java 11** (or later version) installed.

The current version of Panoply is 5.2.8, released 2023-06-30.

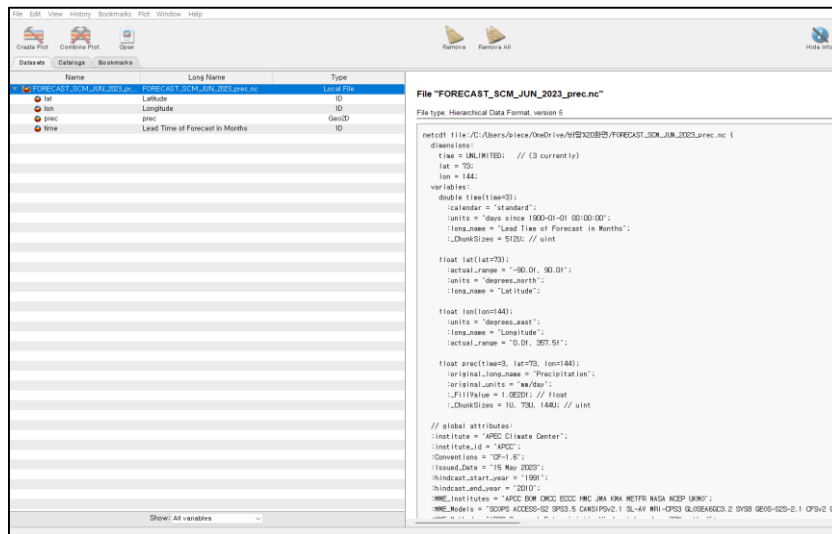
- Download Panoply 5.2.8 for **macOS**, 44 MB DMG, uses native filechooser
- Download Panoply 5.2.8 for **macOS**, 44 MB DMG, uses Java filechooser
- Download Panoply 5.2.8 for **macOS**, 44 MB DMG, requires M1/M2 Mac with ARM64 Java
- Download Panoply 5.2.8 for **Windows**, 41 MB ZIP
- Download Panoply 5.2.8 "generic" for **Linux**, etc., 41 MB ZIP
- Download Panoply 5.2.8 "generic" for **Linux**, etc., 41 MB TGZ
- View checksums: [MD5] [SHA1] [SHA256]

Install and Run Panoply
After downloading the appropriate Panoply archive linked above, uncompress the archive file on your desktop. Within is a **README** text file with an explanation of the contents of the download, instructions on how to launch the application, and some notes on possible launch bugs and/or performance tuning.

We would like to point out the following possible installation and launch issues:

If you find that after download and installation, Panoply won't start, a possible reason might be that you don't have a Java Runtime Engine (JRE) or Java Delopment Kit (JDK) installed on your computer, or that it is not a Java 11 (or later) JRE/JDK.

Download : <https://www.giss.nasa.gov/tools/panoply/download/>

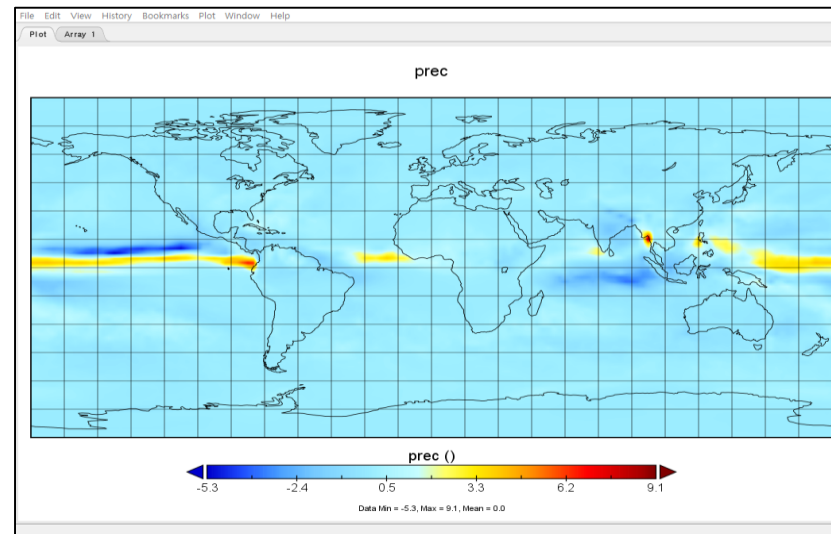


The screenshot shows the Panoply Data Viewer interface with a file list on the left and a detailed view of the selected file 'FORECAST_SCM_JUN_2023_prec.nc' on the right. The file details include:

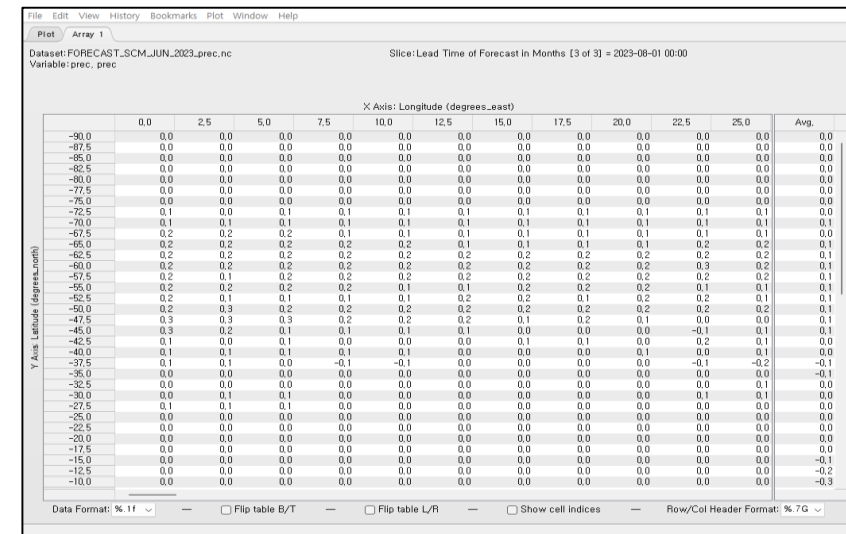
```

File type: Hierarchical Data Format, version 5
netcdf File: /C:/Users/.../Downloads/FORECAST_SCM_JUN_2023_prec.nc
dimensions:
  time = UNLIMITED; // (3 current)
  lat = 73;
  lon = 144;
variables:
  double time(time3);
  coordinate = "standard";
  units = "days since 1900-01-01 00:00:00";
  time_name = "Lead Time of Forecast in Months";
  _ChunkSize = 5120; // uint
  float lat(lat33);
  actual_range = "-90.0r, 90.0r";
  units = "degrees_north";
  time_name = "LatITUDE";
  float lon(lon144);
  units = "degrees_east";
  time_name = "Longitude";
  actual_range = "0.0r, 357.5r";
  float prec(time3, lat33, lon144);
  original_name = "precipitation";
  original_units = "mm/day";
  _FillValue = 1.0E20; // float
  _ChunkSize = 10; 730, 1440; // uint
  // global attributes:
  institution = "APCC Climate Center";
  time_units = "MJD";
  conventions = "CF-1.6";
  issue_date = "15 May 2023";
  hindcast_start_year = "1990";
  hindcast_end_year = "2010";
  netcdf_data = "APCC ESW DCC2 ECC2 INC JJA JJA METR INGA WSP WSP";
  netcdf_data = "2009s ACC25-02 3P25.5 CANSI P2-1.5L-AV W1-CP23 0.5565623.2 3P28 0505-025-2.1 0P24-2";
    
```

.nc File 불러오기/정보 확인



불러온 .nc file Plot



불러온 .nc File Array 확인

| CLIPPING API 기본 구조

#Clipping API 실행을 위한 run.py 파일 구조

```
import api as clipsapi
```

```
c = clipsapi.Client()
```

```
request = {
```

```
    'lead_month': '3-MON',
    'variable': 'prec',
    'method': 'SCM',
    'period': 'Monthly mean',
    'ityear': '2017',
    'imonth': '7',
    'cosouth': '-50',
    'conorth': '70',
    'cowest': '100',
    'coeast': '210'
    'return_type': 'png'
```

사용자 선택 옵션

```
c.clip(request, target)
```

The screenshot shows the CLIPPING API web interface with the following configuration options:

- Lead Time:** `lead_month` (3-MON selected, 6-MON available)
- Year / Month:** Year: 2023, Month: 7. `ityear imonth` labels are present below the dropdowns.
- Methods:** `method` (Deterministic selected, Probabilistic available)
- Period:** `period` (Monthly selected, Seasonal available)
- Variables:** `variable` (prec selected, slp, sst, t2m, t850, z500 available)
- Clipping Area:**
 - `conorth` (Coordinates selected, Region, Country available)
 - `cowest` (0, 360)
 - `coeast` (210)
 - `cosouth` (-90)

MME-Leadtime

- 3-MON
- 6-MON

MME-Method

- Deterministic (SCM)
- Probabilistic (GAUS)

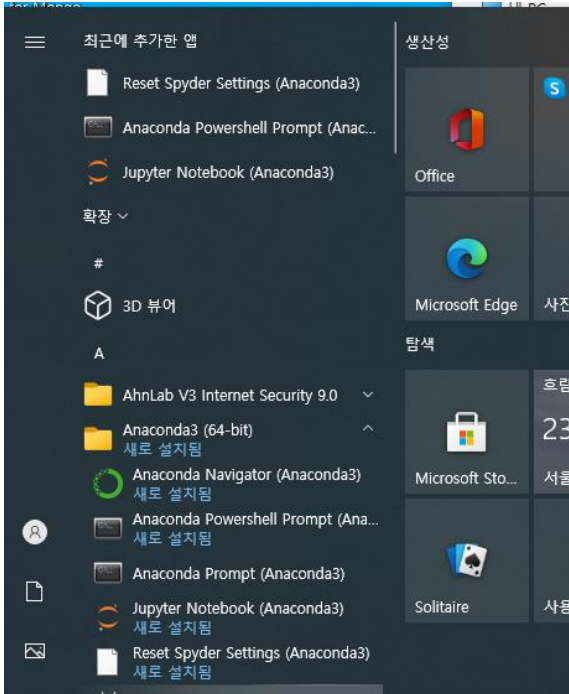
MME-Period

- Monthly
- Seasonal

MME-Variable

- Precipitation
- Sea Level Pressure
- Sea Surface Temperature
- Temperature at 2m
- Temperature at 850hPa
- Geopotential Height at 500hPa

| Spyder 실행



| 파이썬 파일 작성 & 저장

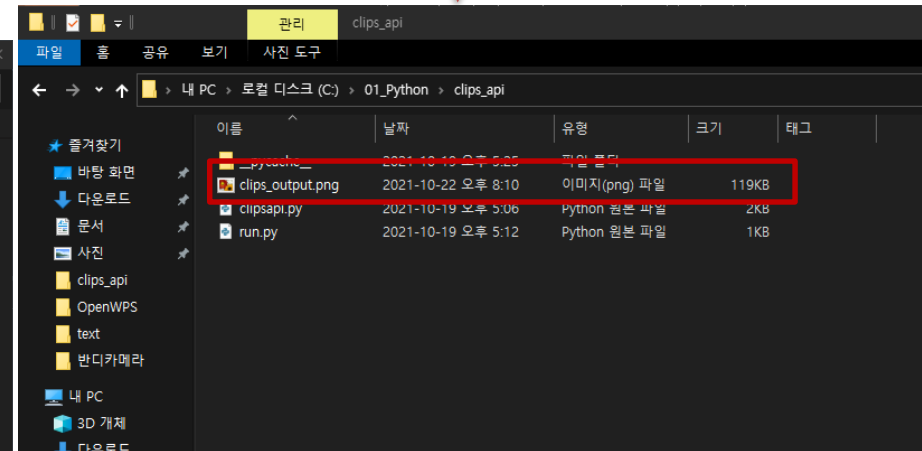
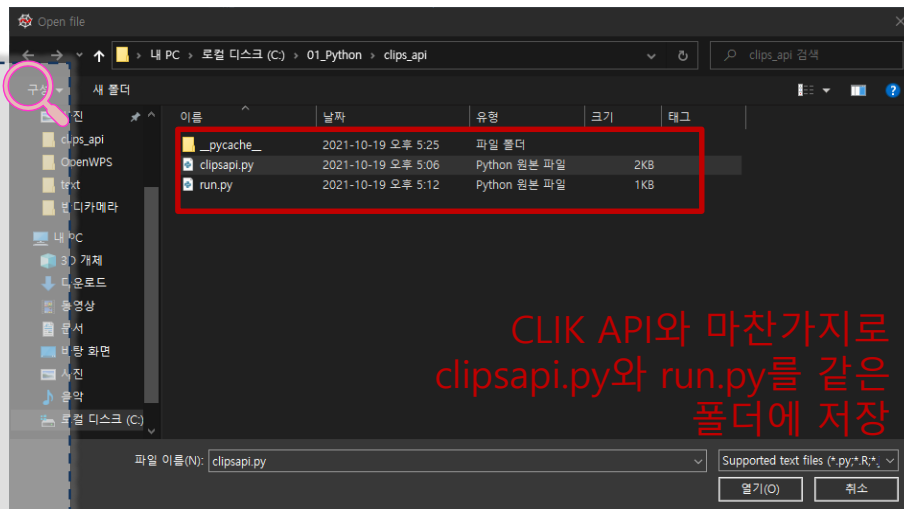
```
File Edit Search Source Run Debug Consoles Projects Tools View Help
C:\#01_Python\#clips_api\#run.py
temp.py x clipsapi.py x run.py x api.py x
1 import clipsapi
2 import json
3 import requests
4
5 c = clipsapi.Client()
6
7 request = {
8     'lead_month': '3-MON',
9     'variable': 'prec',
10    'method': 'SCM',
11    'period': 'Monthly mean',
12    'iyear': '2017',
13    'imonth': '7',
14    'cosouth': '-50',
15    'conorth': '70',
16    'cowest': '100',
17    'coeast': '210'
18 }
19 target = "clips_output.png"
20 c.clip(request, target)
```

```
Console 1/A x
In [4]: runfile('C:/01_Python/clips_api/run.py', wdir='C:/01_Python/clips_api')
Reloaded modules: clipsapi
Start to save file - clips_output.png

Model
Lead Month : 3-MON
Variable : prec
Method : SCM
Period : Monthly mean
Issued Year : 2017
Issued Month : 7

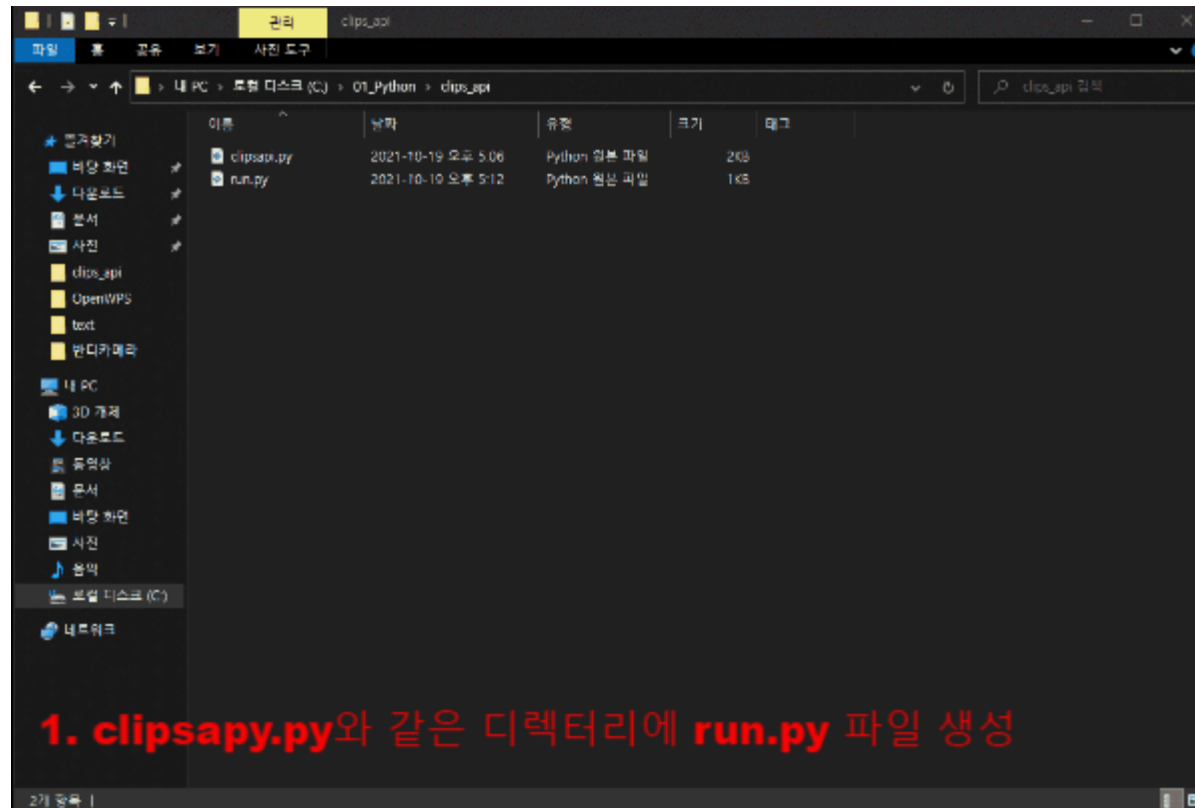
Coordinate
Min Latitude : -50
Max Latitude : 70
Min longitude : 100
Max longitude : 210

clips_output.png download compete!
In [5]:
```



- [예제]
- 예보기간: 3개월 MME
- 자료 Type : Forecast
 - MME 기법 : SCM
 - 변수 : prec
 - 자료 통계 기간: Monthly mean
 - 자료 기간: 2017년 7월
 - 추출 위/경도 : -50, 70, 100, 210

CLIK API와 마찬가지로 clipsapi.py와 run.py를 같은 폴더에 저장





2024년 APEC기후센터 기후정보 생산 및 활동 사용자 워크숍

[실습] 사용자 맞춤형 계절예측 및 검증실습

Prediction – Overview

APCC 계절예측

- APEC 회원국 기상청 및 연구 기관으로 부터 수집된 전 지구 예측 모델의 300개 이상의 앙상블 자료를 종합
- 다중 모델 앙상블(Multi-Model Ensemble, MME) 기법 적용
- 3개월, 6개월 예측자료 제공
- Forecast(기후예측), Hindcast(과거 기후 재현)
- Monthly mean/Seasonal mean 구분 제공

단정 예측(Deterministic MME)

- 개별 모델의 앙상블 예측 값을 각 모델에 동일한 가중치를 부여하여 종합하는 방식
- 예측 값은 편차(기후 값 혹은 평년 값과의 차이)로 제공됨
- 기후 값, 평년 값: 평년 기간 동안의 평균값
- Simple Composite Method (SCM)

확률 예측(Probabilistic MME)

- 개별 모델의 예측 확률을 각 모델별로 가중치를 부여하여 통합하는 방식
- 확률 값 범주: 평년보다 높을 확률, 평년과 비슷할 확률, 평년보다 낮을 확률
- Gaussian fitting method (GAUS)

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Prediction

Notice : A new user-customized APCC seasonal prediction (MME) and verification services based on platform technology has been opened as beta service (Refer to current APCC CLIK service : <https://clik.apcc21.org>). Please leave your any questions and feedbacks about the new service to APCC Help Desk.

Lead Month: 3-MON

Periods: Seasonal Monthly

Year / Season: 2023 7

Methods: Deterministic Probabilistic

Models:

ALL
 APCC_SCOPS BOM_ACCESS-S2 CMCC_SPS3.5 ECCO_CANSIPSv2.1 KMA_GLOSEA6GC3.2 METFR_SYS8 NASA_GEOS-S2S-2.1
 NCEP_CFSv2 PNU-RDA_CGCMv2.0 UKMO_GLOSEA6

Predict

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APCC Seasonal Forecasts

The APCC seasonal forecast is based on multi-model ensemble (MME) prediction system and disseminated to APEC member economics around 15th of every month. Currently, 15 operational centers and research institutes from 11 countries around the world participate in the APCC MME operational prediction system by routinely providing their predictions in the form of ensembles of global forecast fields. The APCC's real-time operational forecasts are issued in both deterministic (based on ensemble mean) and probabilistic (based on full set of ensemble members) forms.

Deterministic MME Forecast

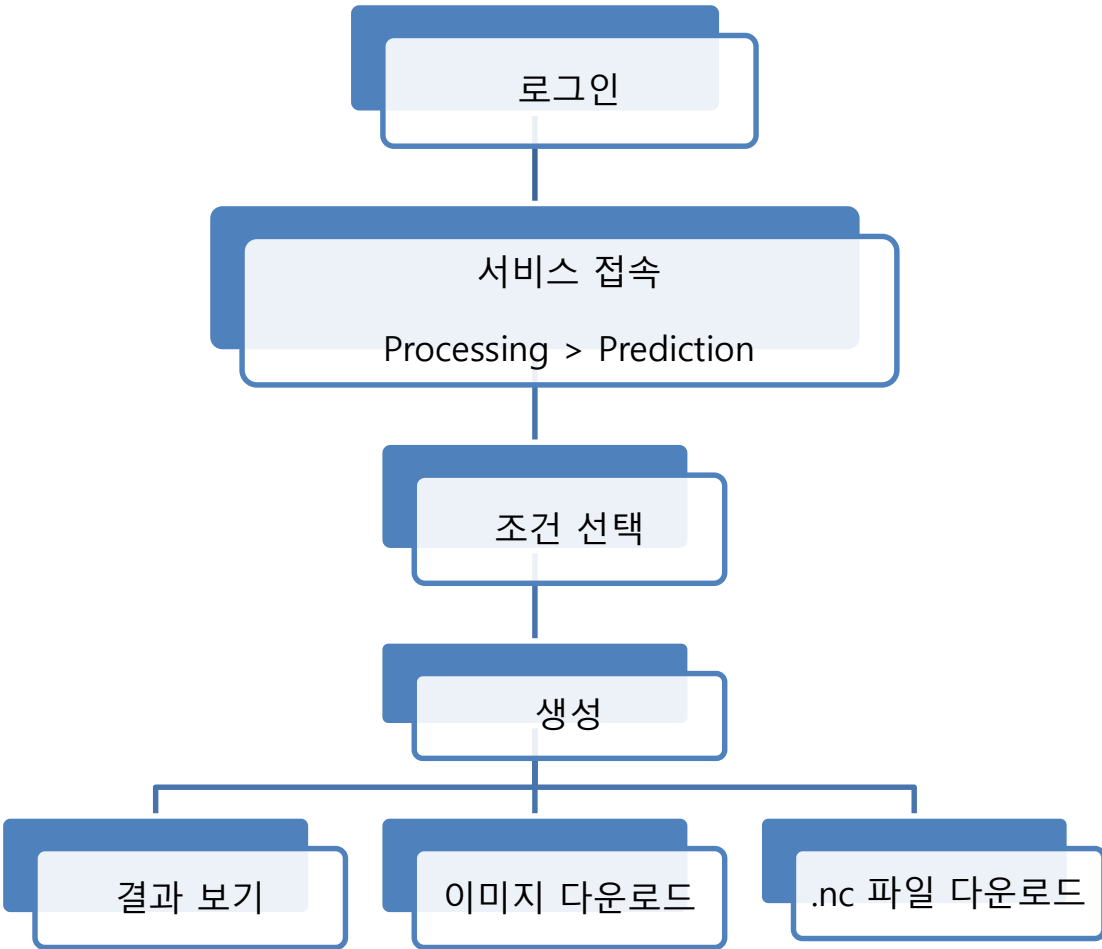
The deterministic forecast is based on a simply average of bias-corrected ensemble means from each model with equal weight to create a multi-model forecast. The ensemble mean anomaly forecasts for each individual model is calculated by their own climatology from the hindcasts.

Probabilistic MME Forecast

The probabilistic forecast is based on an uncalibrated MME with model weights being proportional to the square root of ensemble size, and a Gaussian fitting method for the estimation of the tercile-based categorical probabilities, that is, the probability of below-normal (BN), near-normal (NN), and above-normal (AN) categories with respect to climatology.

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| Prediction 시작하기 - 1 (Prediction 페이지 접속)



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Prediction

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Lead Month: 3-MON

Periods: Seasonal Monthly

Year / Season: 2023 7

Methods: Deterministic Probabilistic

Models:

ALL
 APCC_SCOPS BOM_ACCESS-S2 CMCC_SPS3.5 ECCC_CANSIPsv2.1 KMA_GLOSEA6GC3.2 METFR_SYS8 NASA_GEOS-S2S-2.1
 NCEP_CFSv2 PNU-RDA_CGCMv2.0 UKMO_GLOSEA6

Predict

Download (.png) Download (.nc) Please login.

APCC Seasonal Forecasts

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Deterministic MME Forecast

The deterministic forecast is based on a simply average of bias-corrected ensemble means from each model with equal weight to create a multi-model forecast. The ensemble mean anomaly forecasts for each individual model is calculated by their own climatology from the hindcasts.

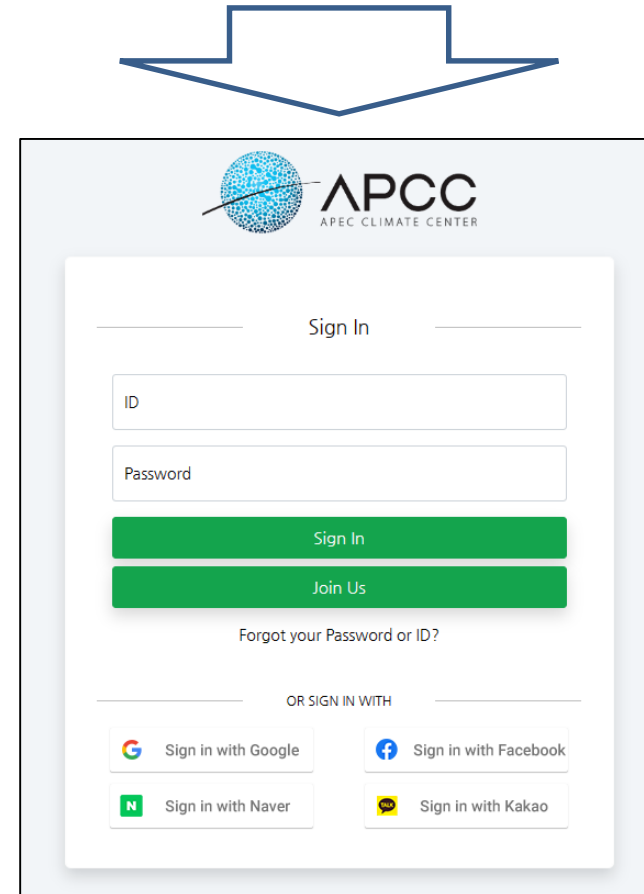
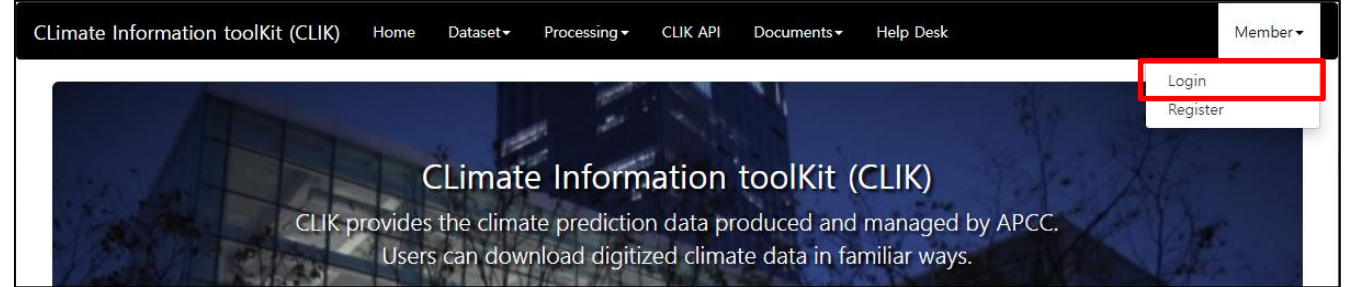
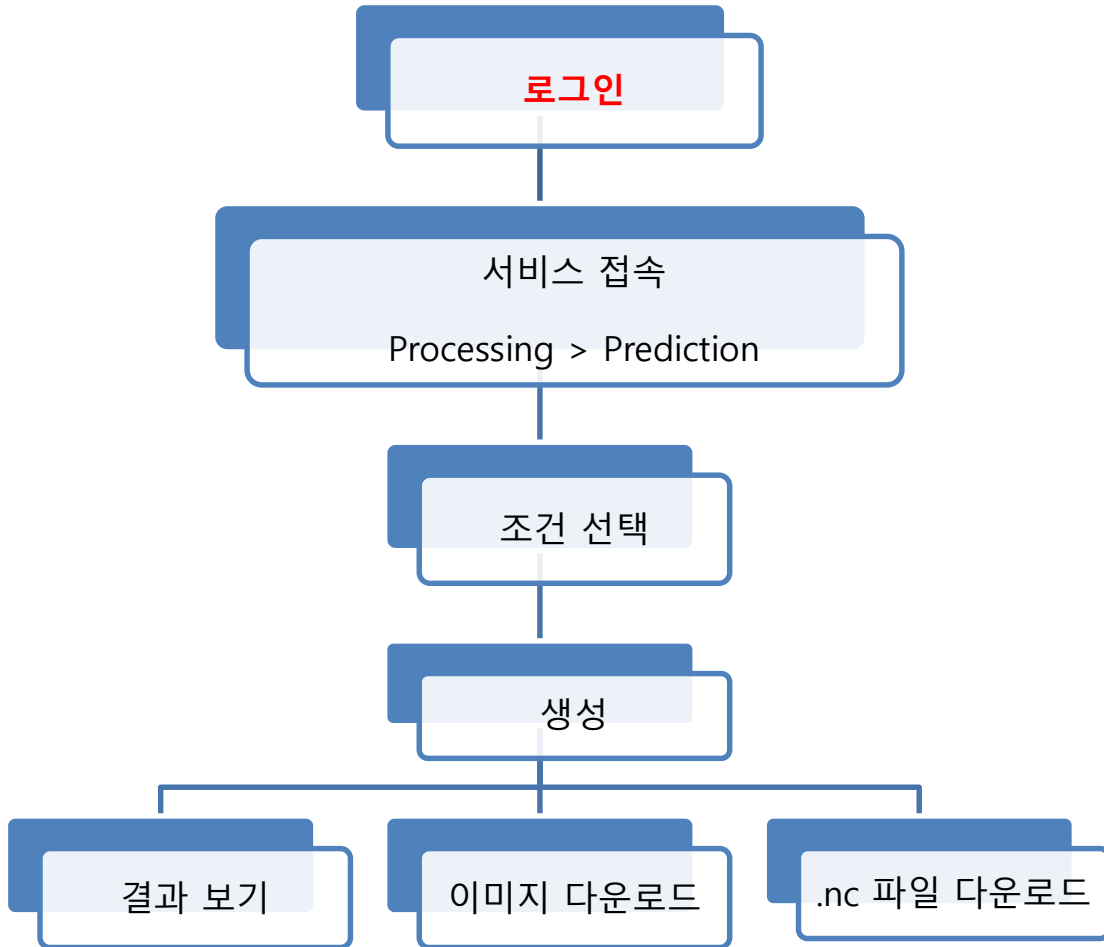
Probabilistic MME Forecast

The probabilistic forecast is based on an uncalibrated MME with model weights being proportional to the square root of ensemble size, and a Gaussian fitting method for the estimation of the tercile-based categorical probabilities, that is, the probability of below-normal (BN), near-normal (NN), and above-normal (AN) categories with respect to climatology.

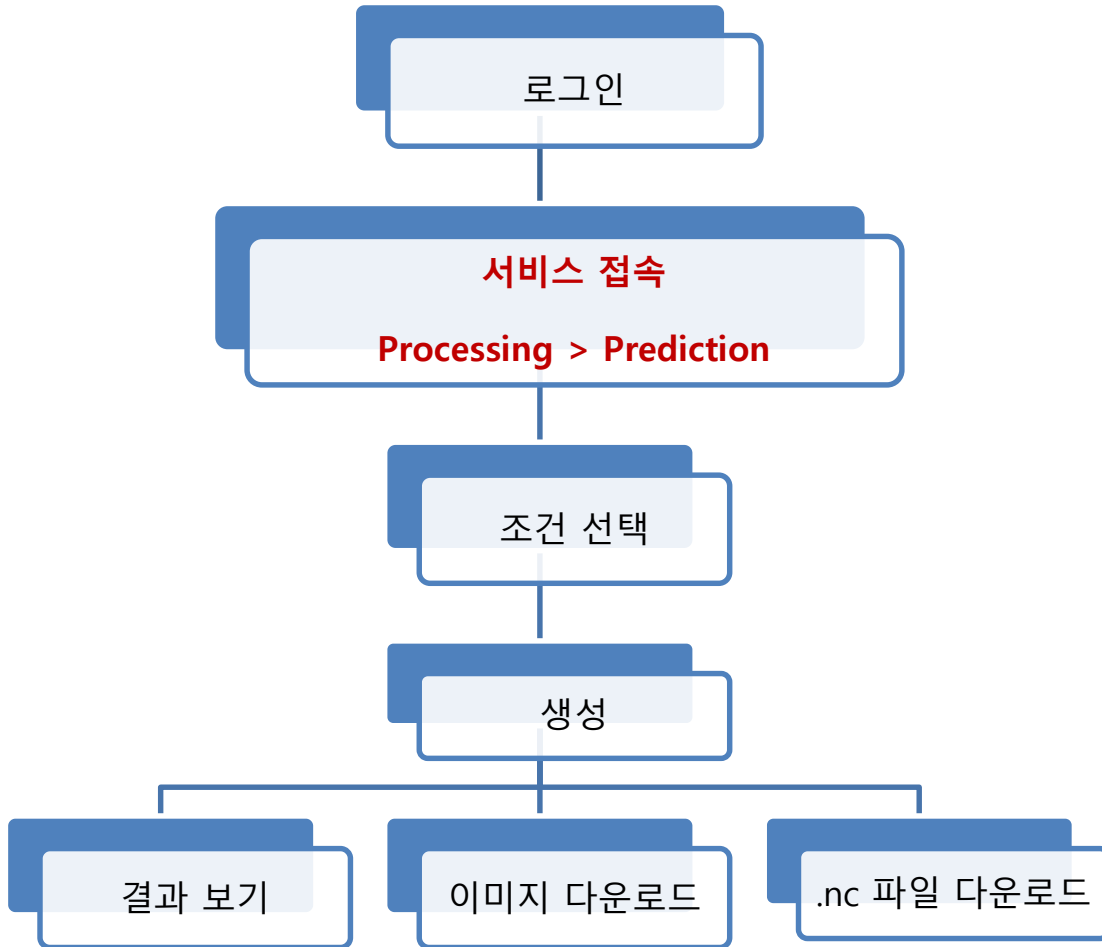
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4. [실습] 사용자 맞춤형 계절예측 및 검증 실습 | Prediction 서비스

| Prediction 시작하기 - 2 (로그인)



| Prediction 시작하기 - 3 (Prediction 페이지 접속)



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Prediction

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Lead Month: 3-MON

Periods: Seasonal Monthly

Year / Season: 2023 7

Methods: Deterministic Probabilistic

Models:

- ALL
- APCC_SCOPS
- BOM_ACCESS-S2
- CMCC_SPS3.5
- ECCO_CANSIPsv2.1
- KMA_GLOSEA6GC3.2
- METFR_SYS8
- NASA_GEOS-S2S-2.1
- NCEP_CFSv2
- PNU-RDA_GCMv2.0
- UKMO_GLOSEA6

Predict

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APCC Seasonal Forecasts

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Deterministic MME Forecast

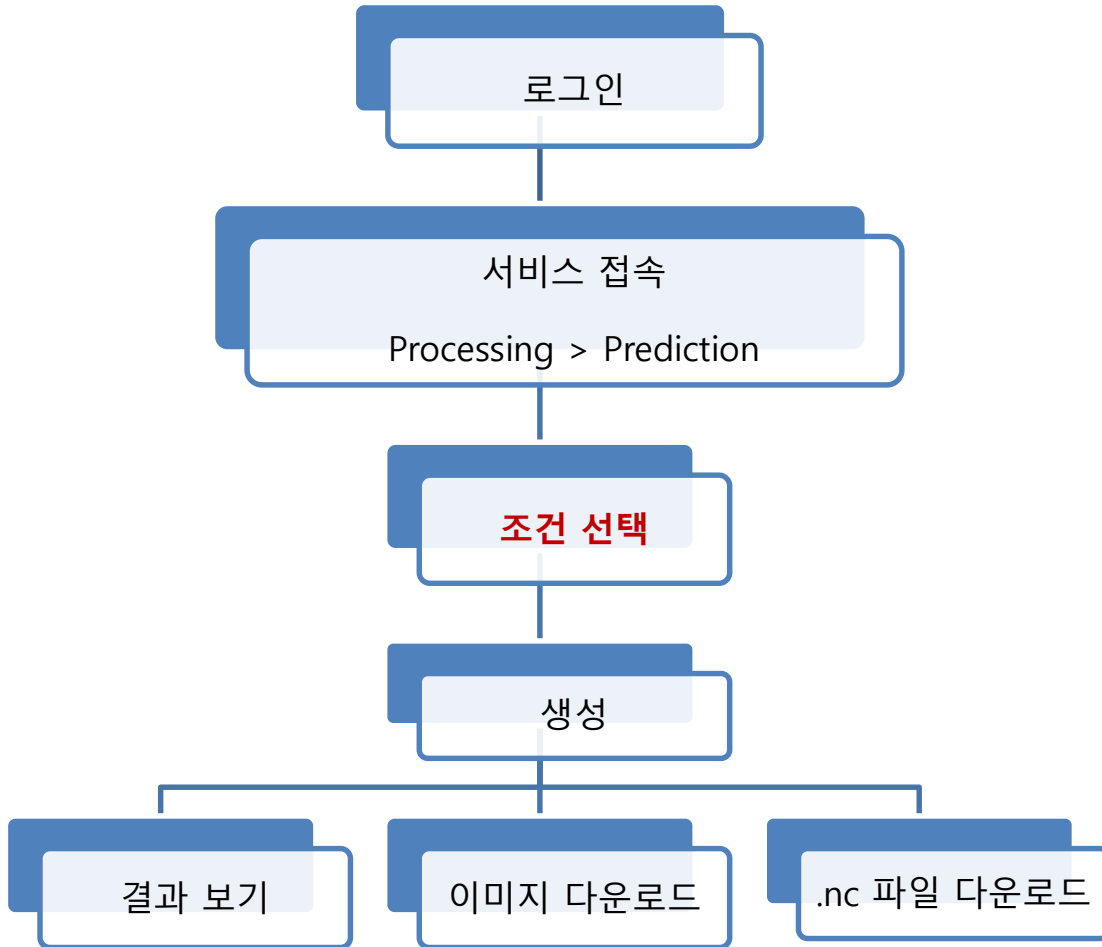
The deterministic forecast is based on a simply average of bias-corrected ensemble means from each model with equal weight to create a multi-model forecast. The ensemble mean anomaly forecasts for each individual model is calculated by their own climatology from the hindcasts.

Probabilistic MME Forecast

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| Prediction 시작하기 - 4 (조건 선택-모델리스트)



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Prediction

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Lead Month: 3-MON

Periods: Seasonal Monthly

Year / Season: 2023 7

Methods: Deterministic Probabilistic

원하는 기간 선택 **Method 선택**

Models: **원하는 모델을 선택**

ALL
 APCC_SCOPS BOM_ACCESS-S2 CMCC_SPS3.5 ECCC_CANSIPsv2.1 KMA_GLOSEA6GC3.2 METFR_SYS8 NASA_GEOS-S2S-2.1
 NCEP_CFSv2 PNU-RDA_CGCMv2.0 UKMO_GLOSEA6

Predict

Download (.png) Download (.nc)

APCC Seasonal Forecasts

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Deterministic MME Forecast

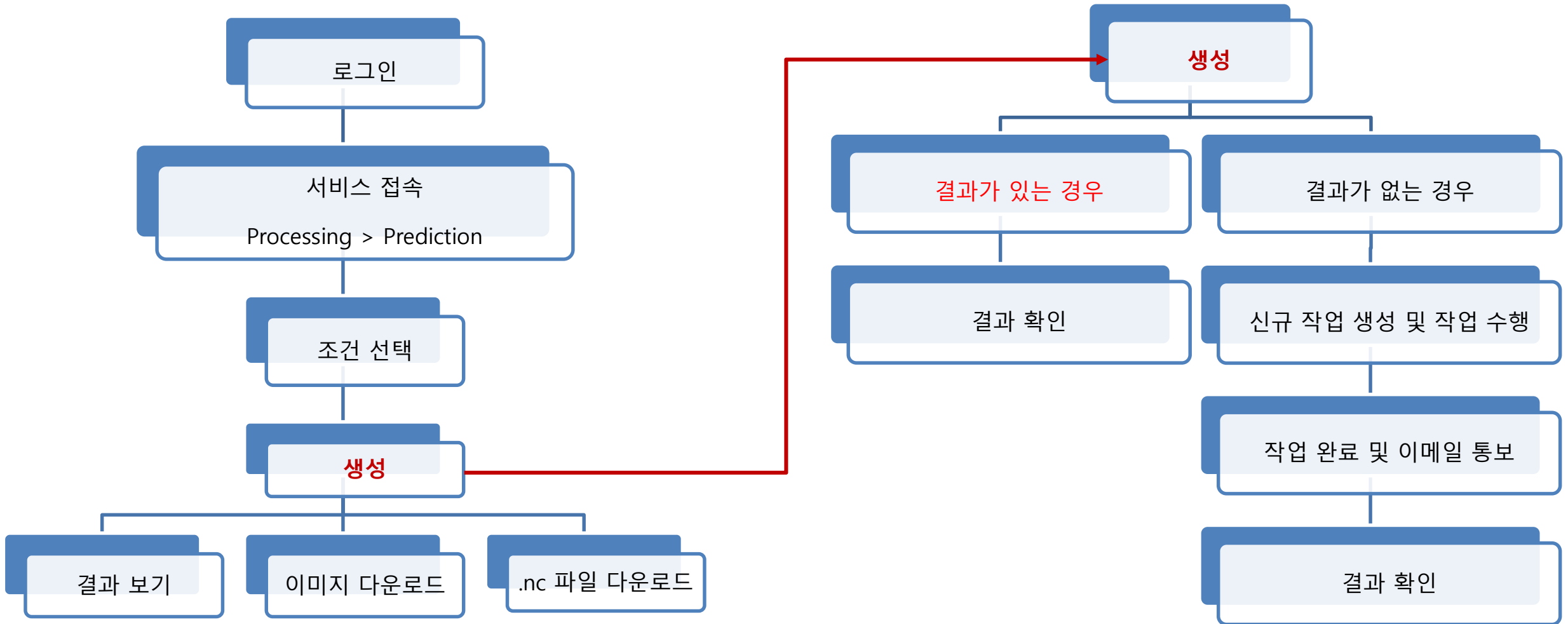
The deterministic forecast is based on a simply average of bias-corrected ensemble means from each model with equal weight to create a multi-model forecast. The ensemble mean anomaly forecasts for each individual model is calculated by their own climatology from the hindcasts.

Probabilistic MME Forecast

The probabilistic forecast is based on an uncalibrated MME with model weights being proportional to the square root of ensemble size, and a Gaussian fitting method for the estimation of the tercile-based categorical probabilities, that is, the probability of below-normal (BN), near-normal (NN), and above-normal (AN) categories with respect to climatology.

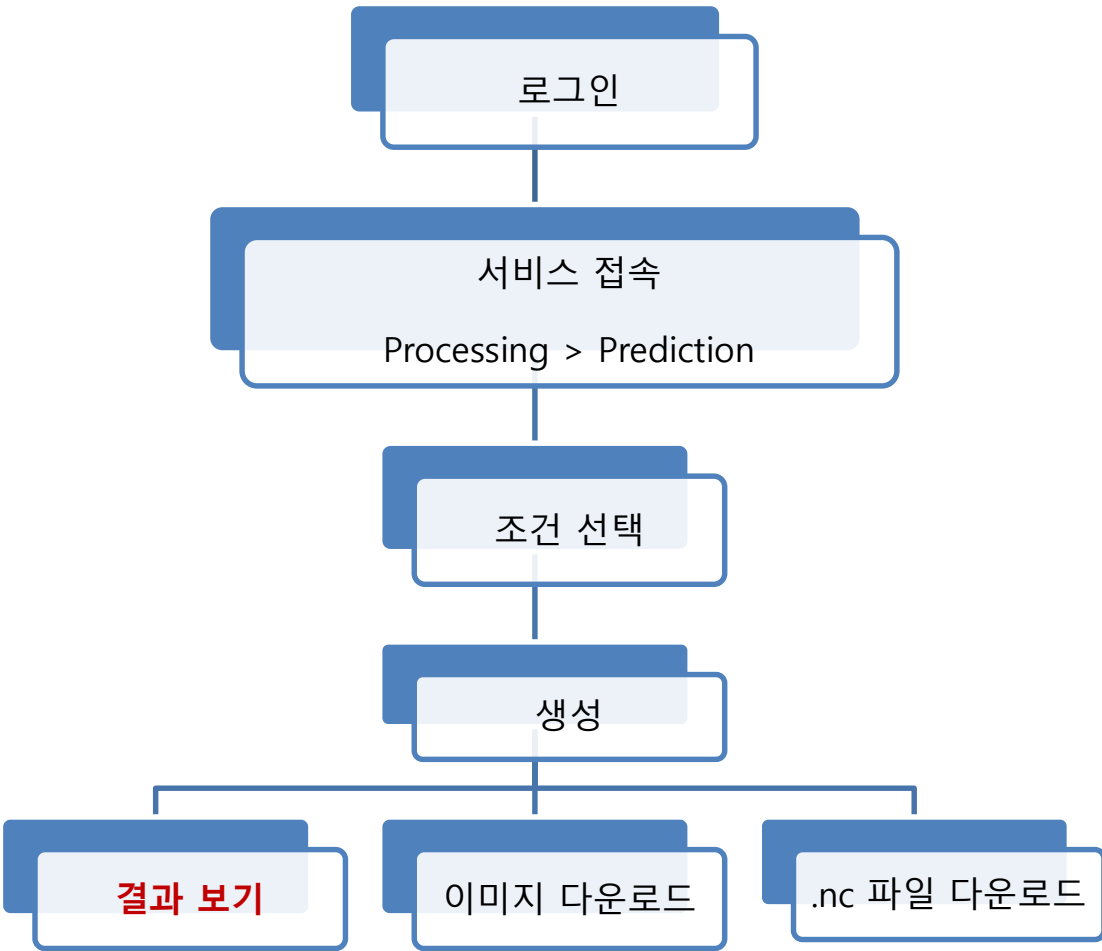
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| Prediction 시작하기 - 5 [생성 과정]



4. [실습] 사용자 맞춤형 계절예측 및 검증 실습 | Prediction 서비스

| Prediction 시작하기 - 6 (동일한 결과가 있는 경우)



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Prediction

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Lead Month: 3-MON

Periods: Seasonal Monthly

Year / Season: 2023 7

Methods: Deterministic Probabilistic

Models:

ALL

APCC_SCOPS BOM_ACCESS-S2 CMCC_SPS3.5 ECCS_CANSIPsv2.1 KMA_GLOSEA6G3.2 METFR_SYS8 NASA_GEOS-S2S-2.1

NCEP_CFSv2 PNU-RDA_CGCMv2.0 UKMO_GLOSEA6

Predict 🔍 사용자간 작업 결과 공유

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PREC (Precipitation)

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SLP (Sea Level Pressure)

Issued: 20 Jun, 2023 © APEC Climate Center

SST (Sea Surface Temperature)

Issued: 20 Jun, 2023 © APEC Climate Center

T2M (Temperature at 2m)

Issued: 20 Jun, 2023 © APEC Climate Center

T850 (Temperature at 850hPa)

Issued: 20 Jun, 2023 © APEC Climate Center

Z500 (Geopotential Height at 500hPa)

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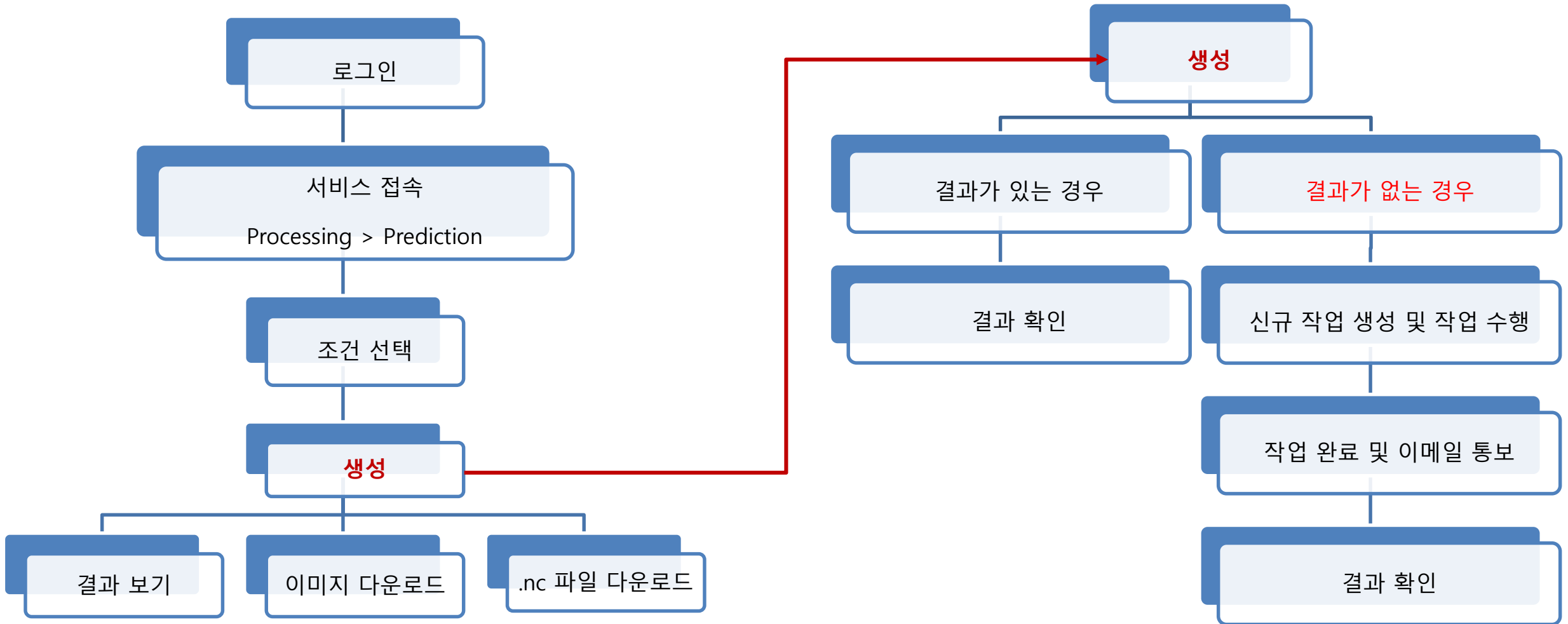
UV200 (Wind at 200hPa)

Issued: 20 Jun, 2023 © APEC Climate Center

UV850 (Wind at 850hPa)

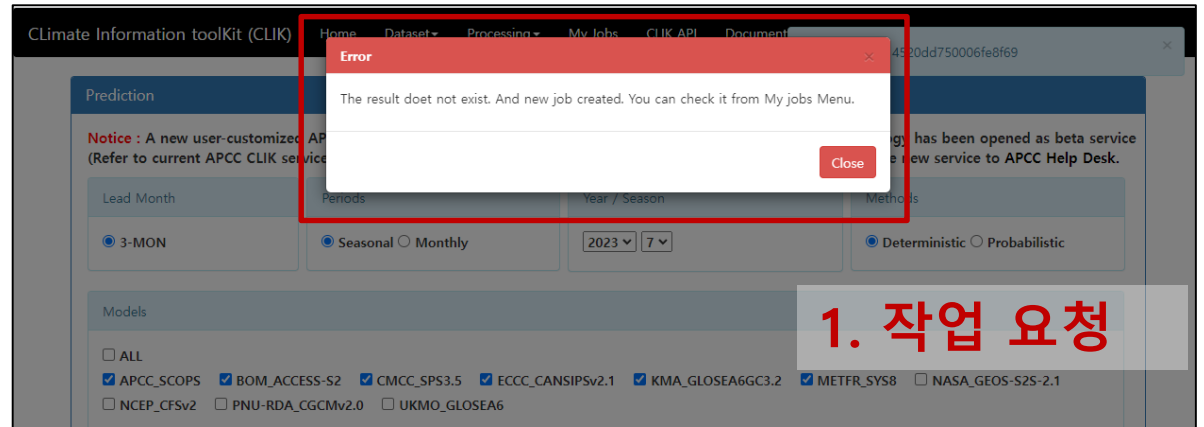
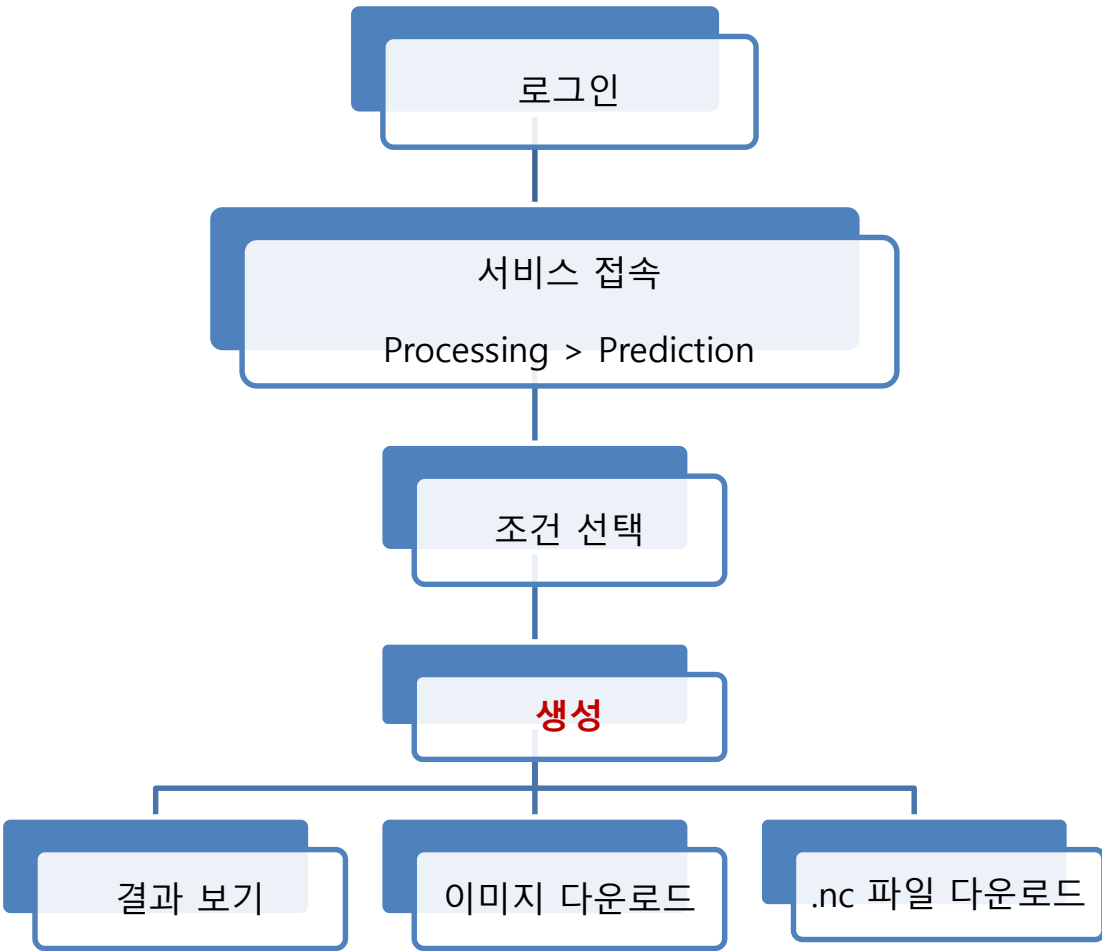
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| Prediction 시작하기 - 7 (생성 과정)



4. [실습] 사용자 맞춤형 계절예측 및 검증 실습 | Prediction 서비스

| Prediction 시작하기 - 8 (동일한 결과가 없는 경우)



2 생성 작업 확인

Job type	Submission date	End date	Status
Prediction	2023-07-06 16:56:40		Running
Prediction	2023-06-30 10:36:42	2023-06-30 10:39:29	Download View
Verification	2023-06-29 14:14:20	2023-06-29 14:26:46	Download View
Prediction	2023-06-29 14:14:06	2023-06-29 14:20:00	Download View

제목 : Notification of job status (APCC) ☆
 보낸사람 : APCC <support@apcc21.org>
 받는사람 : '김상철' <scslow@apcc21.org>

Your job (64a673b820dd750006fe8f65) was completed. Please check the [My Jobs] of the homepage, and [download](#) results.

If you have any question, please use [APCC Help desk](#).

APCC Homepage: <https://www.apcc21.org>
 CLIKs Homepage: <https://cliks.apcc21.org>

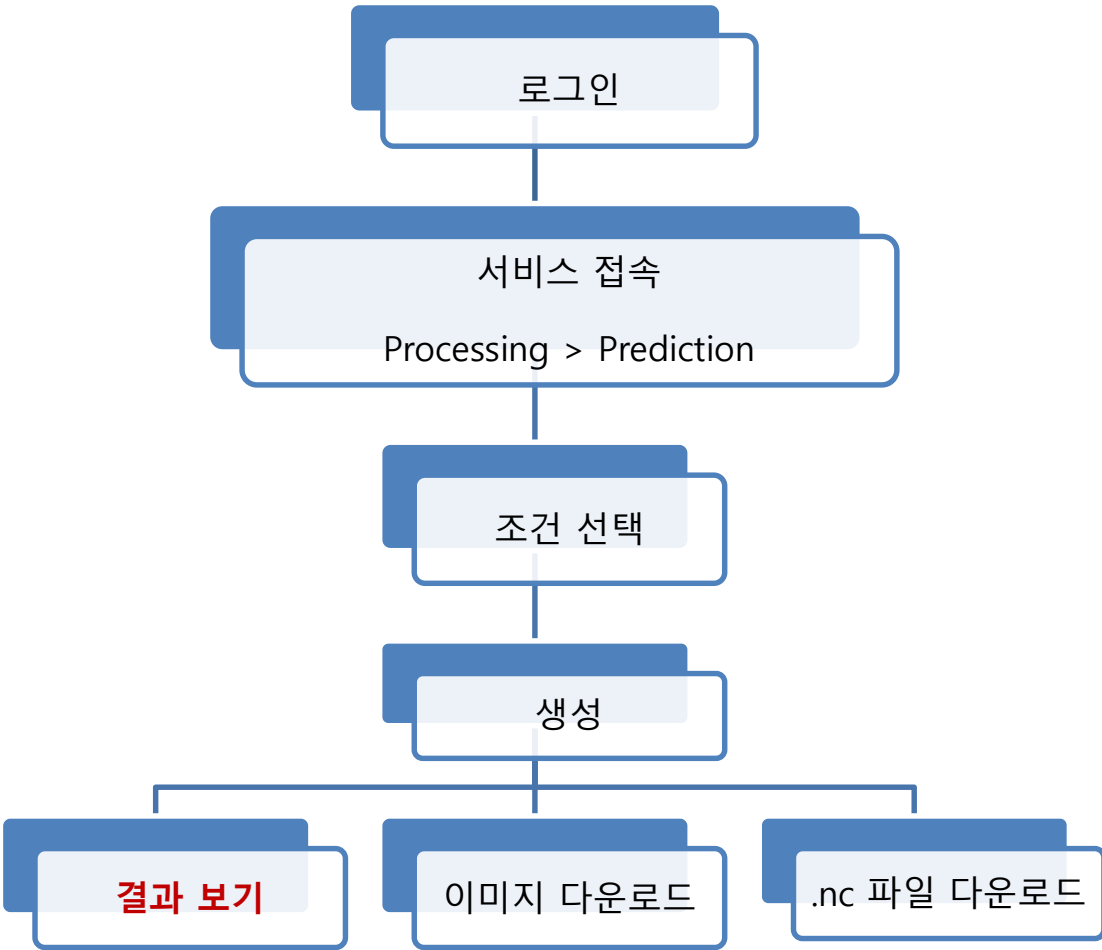
3 생성 작업 완료 메일

4. 다운로드 / 결과확인

Job type	Submission date	End date	Status
Prediction	2023-07-06 16:56:40	2023-07-06 17:01:31	Download View
Prediction	2023-06-30 10:36:42	2023-06-30 10:39:29	Download View
Verification	2023-06-29 14:14:20	2023-06-29 14:26:46	Download View
Prediction	2023-06-29 14:14:06	2023-06-29 14:20:00	Download View

4. [실습] 사용자 맞춤형 계절예측 및 검증 실습 | Prediction 서비스

| Prediction 시작하기 - 9 (동일한 결과가 없는 경우)



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Prediction

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Lead Month: 3-MON

Periods: Seasonal Monthly

Year / Season: 2023 7

Methods: Deterministic Probabilistic

Models:

ALL

APCC_SCOPS BOM_ACCESS-S2 CMCC_SPS3.5 ECCS_CANSIPsv2.1 KMA_GLOSEA6G3.2 METFR_SYS8 NASA_GEOS-S2S-2.1

NCEP_CFSv2 PNU-RDA_CGCMv2.0 UKMO_GLOSEA6

Predict

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PREC (Precipitation)

Precipitation for July-September 2023

SLP (Sea Level Pressure)

Sea Level Pressure for July-September 2023

SST (Sea Surface Temperature)

Sea Surface temperature for July-September 2023

T2M (Temperature at 2m)

Temperature at 2m for July-September 2023

T850 (Temperature at 850hPa)

Temperature at 850hPa for July-September 2023

Z500 (Geopotential Height at 500hPa)

Geopotential height at 500hPa for July-September 2023

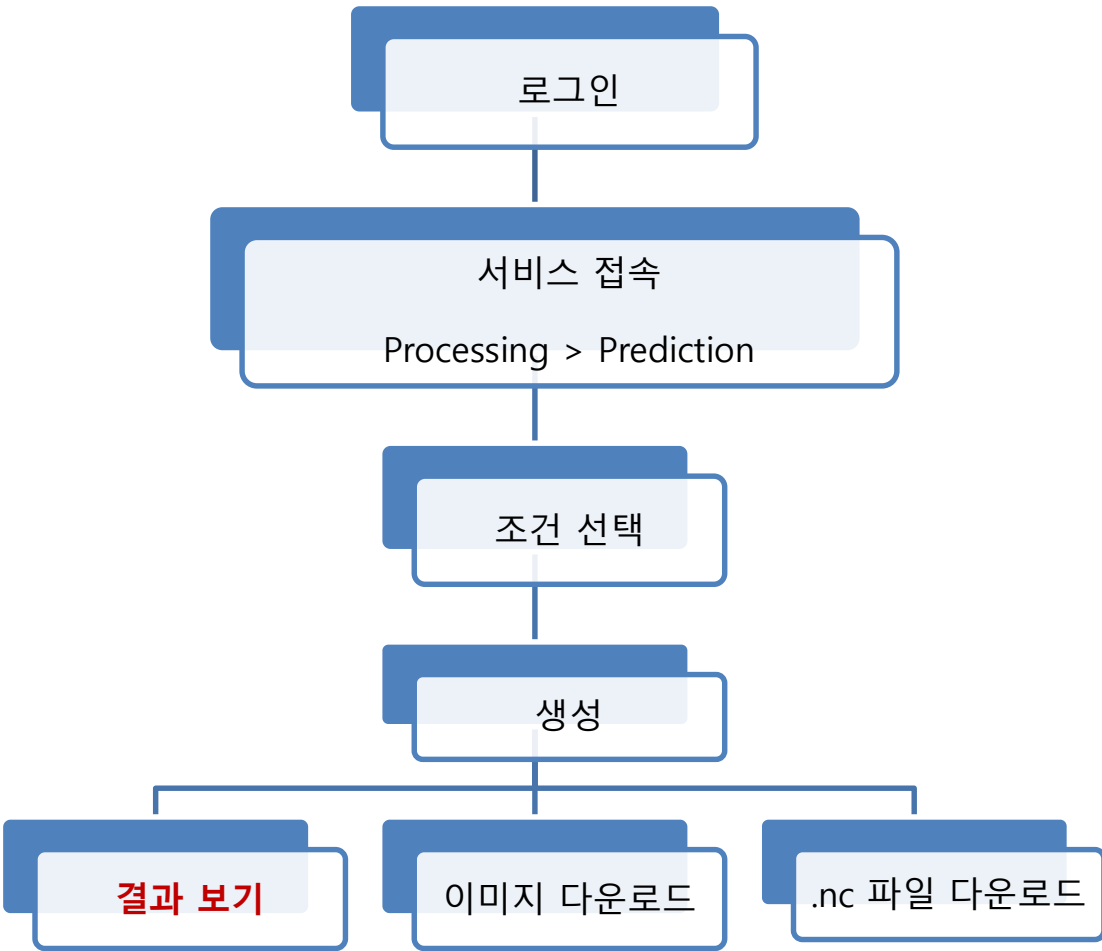
UV200 (Wind at 200hPa)

UV850 (Wind at 850hPa)

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4. [실습] 사용자 맞춤형 계절예측 및 검증 실습 | Prediction 서비스

| Prediction 시작하기 - 10 (결과 이미지 클릭)



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Prediction

Notice : A new user-customized APCC seasonal prediction (Refer to current APCC CLIK service : <https://clik.apcc21.org>)

Lead Month: 3-MON

Periods: Seasonal Monthly

Models:

ALL APCC_SCOPS BOM_ACCESS-S2 CMCC_SPS3.5 NCEP_CFSv2 PNU-RDA_CGCMv2.0 UKMO_GLOSEP

Predict

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PREC (Precipitation)

Precipitation for July-September 2023 Unit:mm/day

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원본 사이즈

SLP (Sea Level Pressure)

Sea Level Pressure for July-September 2023 Unit:mb

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Sea Surface temperature for July-September 2023 Unit:deg K

Issued: 20 Jun, 2023 © APEC Climate Center

T2M (Temperature at 2m)

Temperature at 2m for July-September 2023 Unit:deg K

Issued: 20 Jun, 2023 © APEC Climate Center

T850 (Temperature at 850hPa)

Temperature at 850hPa for July-September 2023 Unit:deg K

Issued: 20 Jun, 2023 © APEC Climate Center

Z500 (Geopotential Height at 500hPa)

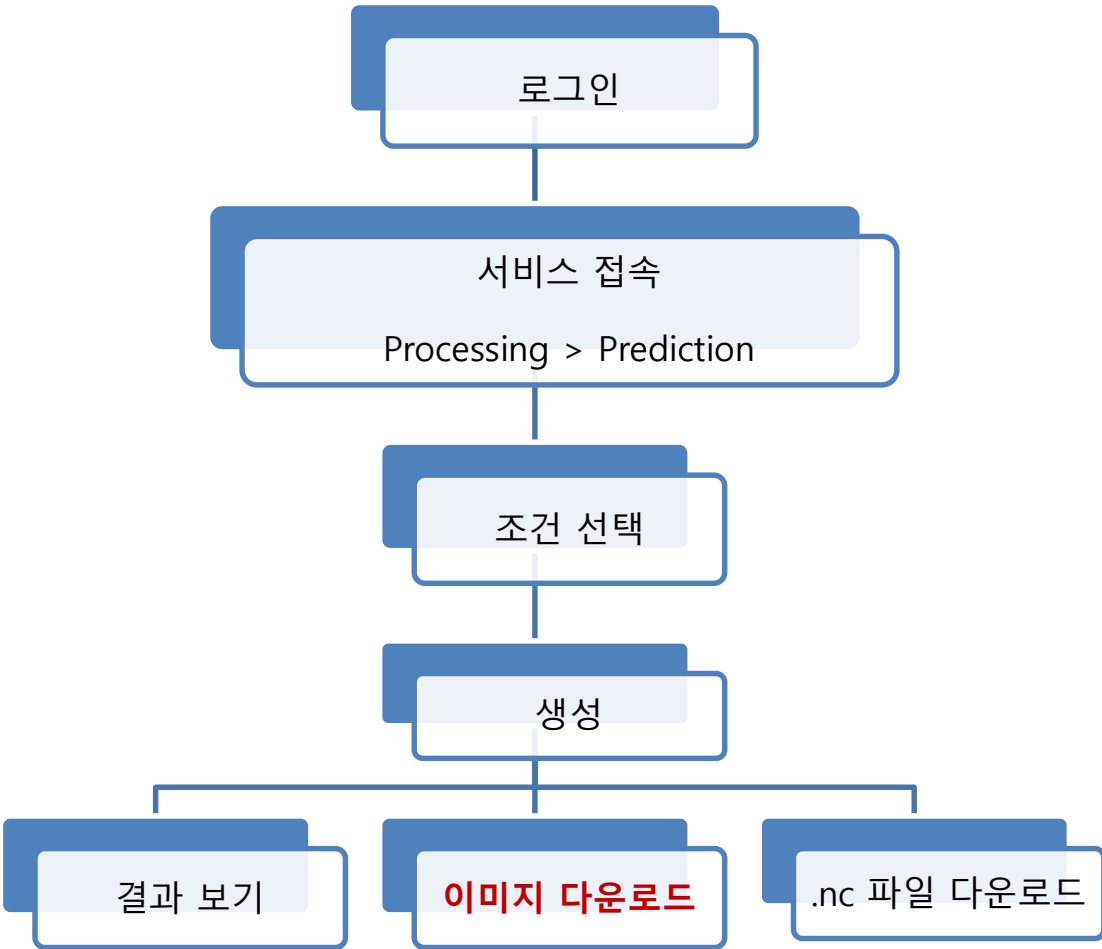
Geopotential height at 500hPa for July-September 2023 Unit:m

Issued: 20 Jun, 2023 © APEC Climate Center

UV200 (Wind at 200hPa)

UV850 (Wind at 850hPa)

| Prediction 시작하기 - 11 (이미지 다운로드)



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Prediction

Notice : A new user-customized APCC seasonal prediction (MME) and verification services based on platform technology has been opened as beta service (Refer to current APCC CLIK service : <https://clik.apcc21.org>). Please leave your any questions and feedbacks about the new service to APCC Help Desk.

Lead Month: 3-MON

Periods: Seasonal Monthly

Models: ALL APCC_SCOPS BOM_ACCESS NCEP_CFSv2 PNUK UKMO_GLO

이름

- 3-MON_FORECAST_SCM_MME_OUT_FIG_SEASONAL_prec.png
- 3-MON_FORECAST_SCM_MME_OUT_FIG_SEASONAL_slp.png
- 3-MON_FORECAST_SCM_MME_OUT_FIG_SEASONAL_sst.png
- 3-MON_FORECAST_SCM_MME_OUT_FIG_SEASONAL_t2m.png
- 3-MON_FORECAST_SCM_MME_OUT_FIG_SEASONAL_t850.png
- 3-MON_FORECAST_SCM_MME_OUT_FIG_SEASONAL_u200.png
- 3-MON_FORECAST_SCM_MME_OUT_FIG_SEASONAL_u850.png
- 3-MON_FORECAST_SCM_MME_OUT_FIG_SEASONAL_uv200.png
- 3-MON_FORECAST_SCM_MME_OUT_FIG_SEASONAL_uv850.png
- 3-MON_FORECAST_SCM_MME_OUT_FIG_SEASONAL_v200.png
- 3-MON_FORECAST_SCM_MME_OUT_FIG_SEASONAL_v850.png
- 3-MON_FORECAST_SCM_MME_OUT_FIG_SEASONAL_z500.png

Download (.png) **Download (.nc)**

PREC (Precipitation) **SLP**

Precipitation for July-September 2023 **Unit: mm/day**

Sea Level Pressure for July-September 2023 **Unit: hPa**

Sea Surface temperature for July-September 2023 **Unit: deg K**

T2M (Temperature at 2m) **T850 (Temperature at 850hPa)** **Z500 (Geopotential Height at 500hPa)**

Temperature at 2m for July-September 2023 **Unit: deg K**

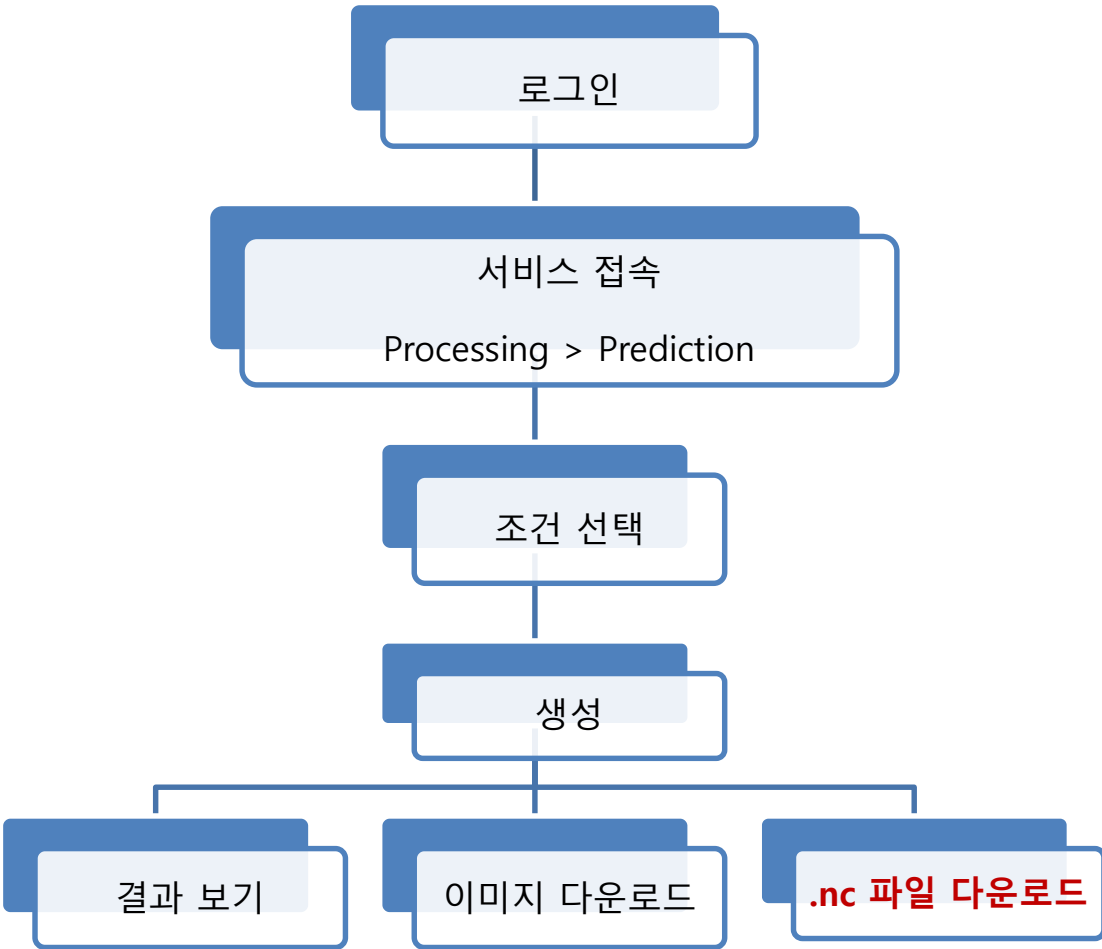
Temperature at 850hPa for July-September 2023 **Unit: deg K**

Geopotential height at 500hPa for July-September 2023 **Unit: m**

UV200 (Wind at 200hPa) **UV850 (Wind at 850hPa)**

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Prediction 시작하기 - 12 (.nc 파일 다운로드)



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Prediction

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Lead Month: 3-MON

Periods: Seasonal Monthly

Models: ALL APCC_SCOPS BCCR_CESS-S2 CMCC_SPS3.5 NCEP_CFSv2 CNRM-CM6.3 FGOALS-G2.3 GISS-EM2.3.3 INM-CM4.5 IPSL-CM6A1R MIROC6 MRI-CGCM3.2.2a NCAR-CCSM3 CNRM-CM6.3 FGOALS-G2.3 GISS-EM2.3.3 INM-CM4.5 IPSL-CM6A1R MIROC6 MRI-CGCM3.2.2a NCAR-CCSM3

이름

- 3-MON_FORECAST_SCM_MME_OUT_DATA_SEASONAL_prec.nc
- 3-MON_FORECAST_SCM_MME_OUT_DATA_SEASONAL_slp.nc
- 3-MON_FORECAST_SCM_MME_OUT_DATA_SEASONAL_sst.nc
- 3-MON_FORECAST_SCM_MME_OUT_DATA_SEASONAL_t2m.nc
- 3-MON_FORECAST_SCM_MME_OUT_DATA_SEASONAL_t850.nc
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- 3-MON_FORECAST_SCM_MME_OUT_DATA_SEASONAL_z500.nc

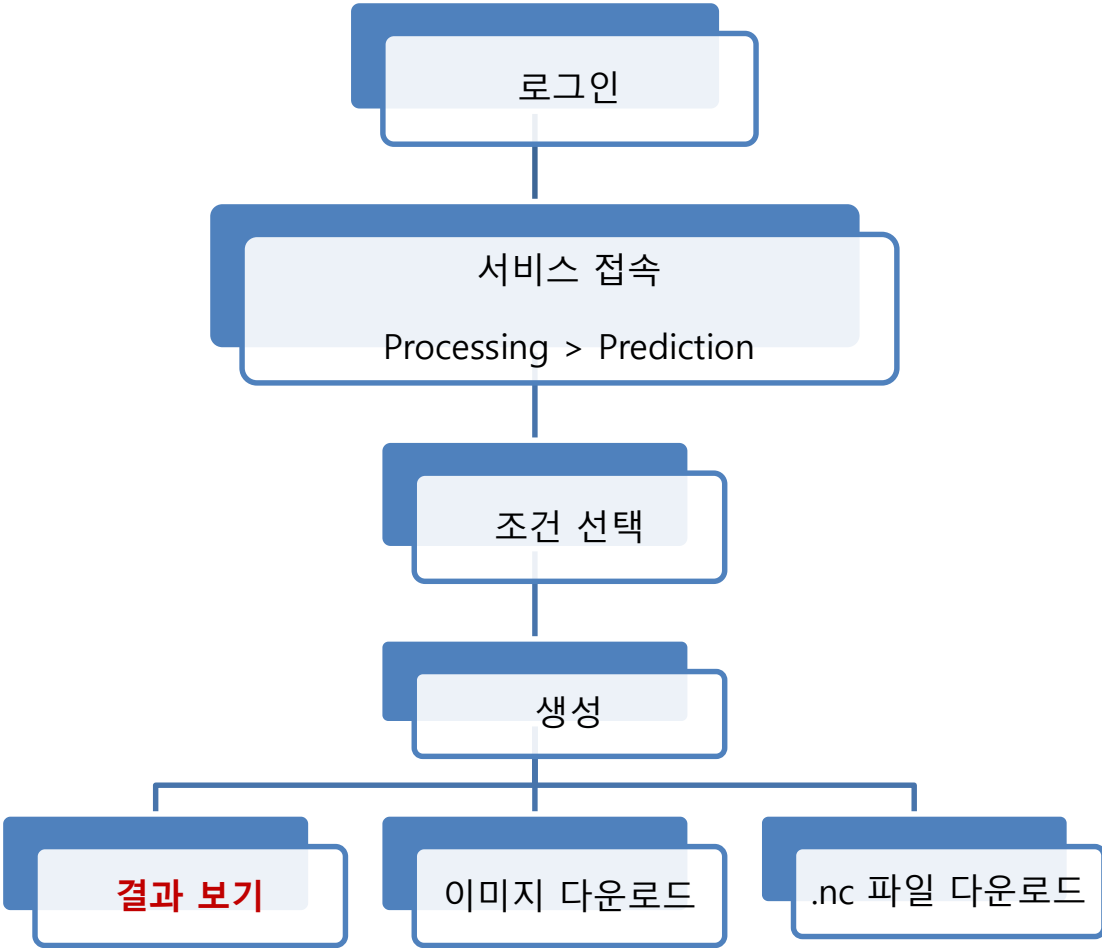
PREC (Precipitation) **SLP (Sea Level Pressure)** **SST (Sea Surface Temperature)**

T2M (Temperature at 2m) **T850 (Temperature at 850hPa)** **Z500 (Geopotential Height at 500hPa)**

UV200 (Wind at 200hPa) **UV850 (Wind at 850hPa)**

4. [실습] 사용자 맞춤형 계절예측 및 검증 실습 | Prediction 서비스

| Prediction 시작하기 - 13 (Periods - Monthly)



Climate Information toolKit (CLIK) Home Dataset Processing My Jobs CLIK API Documents Help Desk Member

Prediction

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Lead Month: 3-MON

Periods: Seasonal **Monthly**

Year / Season: 2023 7

Methods: Deterministic Probabilistic

Models:

ALL APCC_SCOPS BOM_ACCESS-S2 CMCC_SPS3.5 ECCS_CANSIPSv2.1 KMA_GLOSEA6GC3.2 METFR_SYS8 NASA_GEOS-S2S-2.1

NCEP_CFSv2 PNU-RDA_CGCMv2.0 UKMO_GLOSEA6

Predict

Download (.png) Download (.nc)

First Month Second Month Third Month

PREC (Precipitation)

Precipitation for JUL 2023

SLP (Sea Level Pressure)

Sea Level Pressure for JUL 2023

SST (Sea Surface Temperature)

Sea Surface temperature for JUL 2023

T2M (Temperature at 2m)

Temperature at 2m for JUL 2023

T850 (Temperature at 850hPa)

Temperature at 850hPa for JUL 2023

Z500 (Geopotential Height at 500hPa)

Geopotential height at 500hPa for JUL 2023

APCC
APEC CLIMATE CENTER

4. [실습] 사용자 맞춤형 계절예측 및 검증 실습 | Prediction 서비스

| Prediction 시작하기 – 14 (Monthly 상세)

Prediction

Notice : A new user-customized APCC seasonal prediction (MME) and verification (Refer to current APCC CLIK service : <https://clik.apcc21.org>). Please leave your an

Lead Month: 3-MON

Periods: Seasonal Monthly

Year / Season: 2023

Models:

ALL

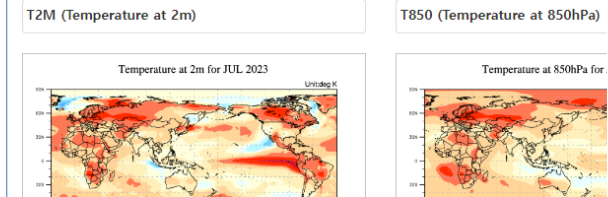
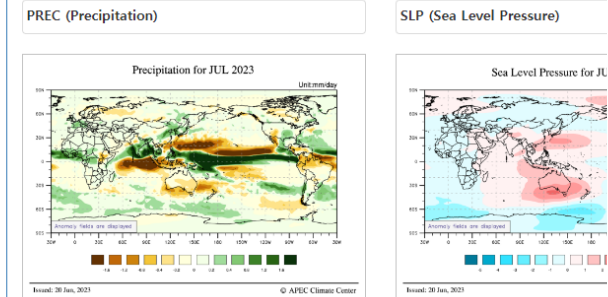
APCC_SCOPS BOM_ACCESS-S2 CMCC_SPS3.5 ECCC_CANSIPsv2.1

NCEP_CFSv2 PNU-RDA_CGCMv2.0 UKMO_GLOSEA6

Predict

Download (.png) Download (.nc)

First Month Second Month Third Month



Prediction

Notice : A new user-customized APCC seasonal prediction (MME) and verification (Refer to current APCC CLIK service : <https://clik.apcc21.org>).

Lead Month: 3-MON

Periods: Seasonal Monthly

Models:

ALL

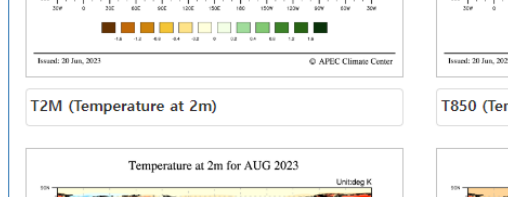
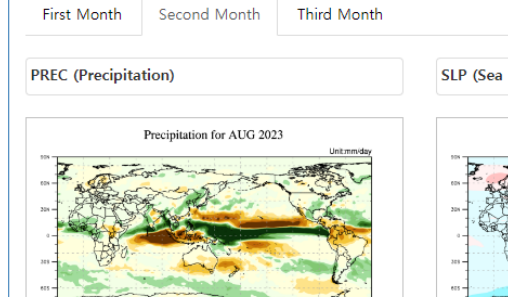
APCC_SCOPS BOM_ACCESS-S2 CMCC_SPS3.5 ECCC_CANSIPsv2.1

NCEP_CFSv2 PNU-RDA_CGCMv2.0 UKMO_GLOSEA6

Predict

Download (.png) Download (.nc)

First Month Second Month Third Month



Prediction

Notice : A new user-customized APCC seasonal prediction (MME) and verification services based on platform technology has been opened as beta service (Refer to current APCC CLIK service : <https://clik.apcc21.org>). Please leave your any questions and feedbacks about the new service to APCC Help Desk.

Lead Month: 3-MON

Periods: Seasonal Monthly

Year / Season: 2023 7

Methods: Deterministic Probabilistic

Models:

ALL

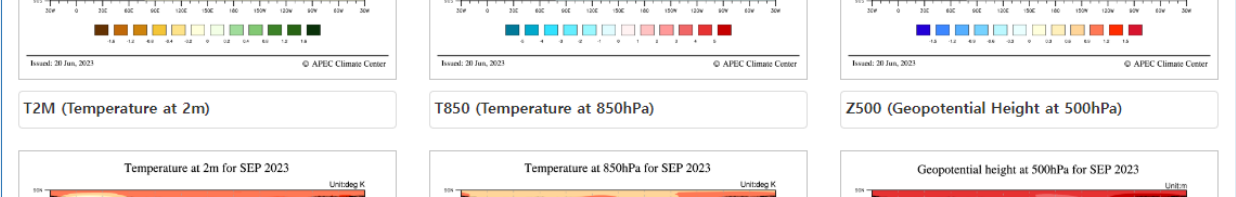
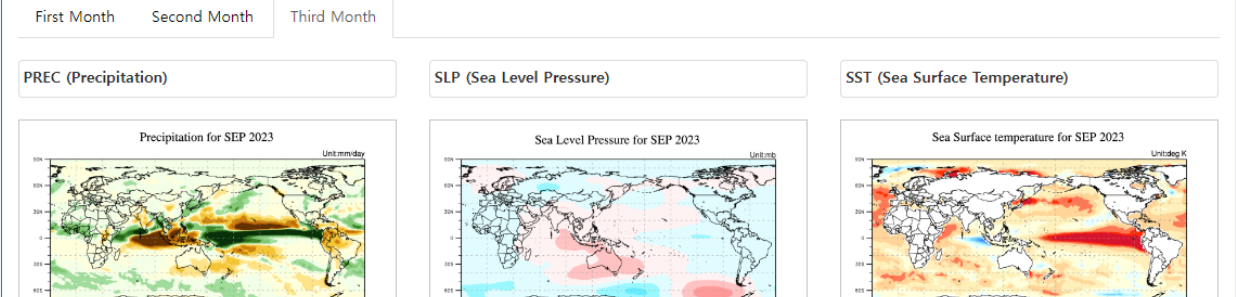
APCC_SCOPS BOM_ACCESS-S2 CMCC_SPS3.5 ECCC_CANSIPsv2.1 KMA_GLOSEA6G3.2 METFR_SYS8 NASA_GEOS-S2S-2.1

NCEP_CFSv2 PNU-RDA_CGCMv2.0 UKMO_GLOSEA6

Predict

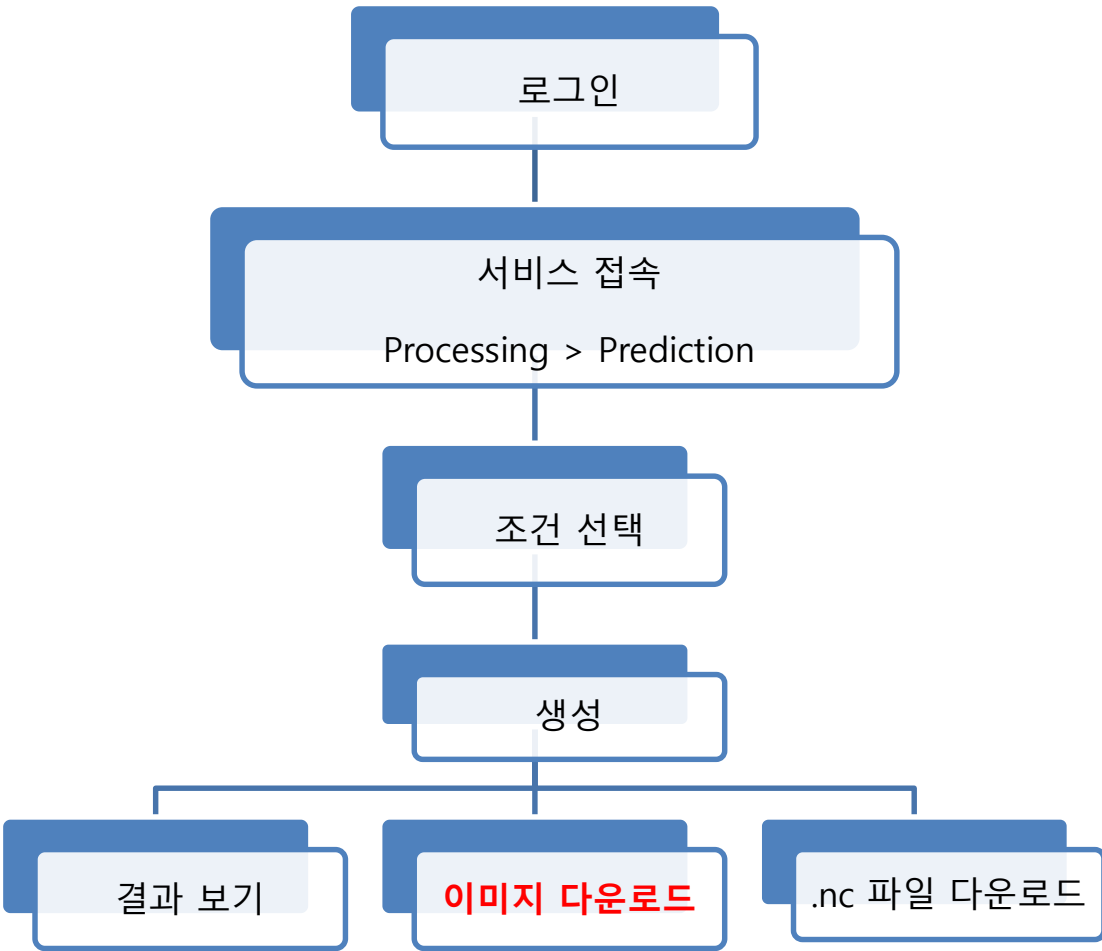
Download (.png) Download (.nc)

First Month Second Month Third Month



4. [실습] 사용자 맞춤형 계절예측 및 검증 실습 | Prediction 서비스

| Prediction 시작하기 - 15 (Monthly 이미지 다운로드)



Climate Information toolKit (CLIK) Home Dataset Processing My Jobs CLIK API Documents Help Desk Member

Prediction

Notice : A new user-customized APCC seasonal prediction (MME) and verification services based on platform technology has been opened as beta service (Refer to current APCC CLIK service : <https://clik.apcc21.org>). Please leave your any questions and feedbacks about the new service to APCC Help Desk.

Lead Month: 3-MON

Periods: Seasonal Monthly

Models: ALL APCC_SCOPS BOM_ACCESS-SC NCEP_CFSv2 PNU-PR UKMO-GLOSEA6

Download (.png) **Download (.nc)**

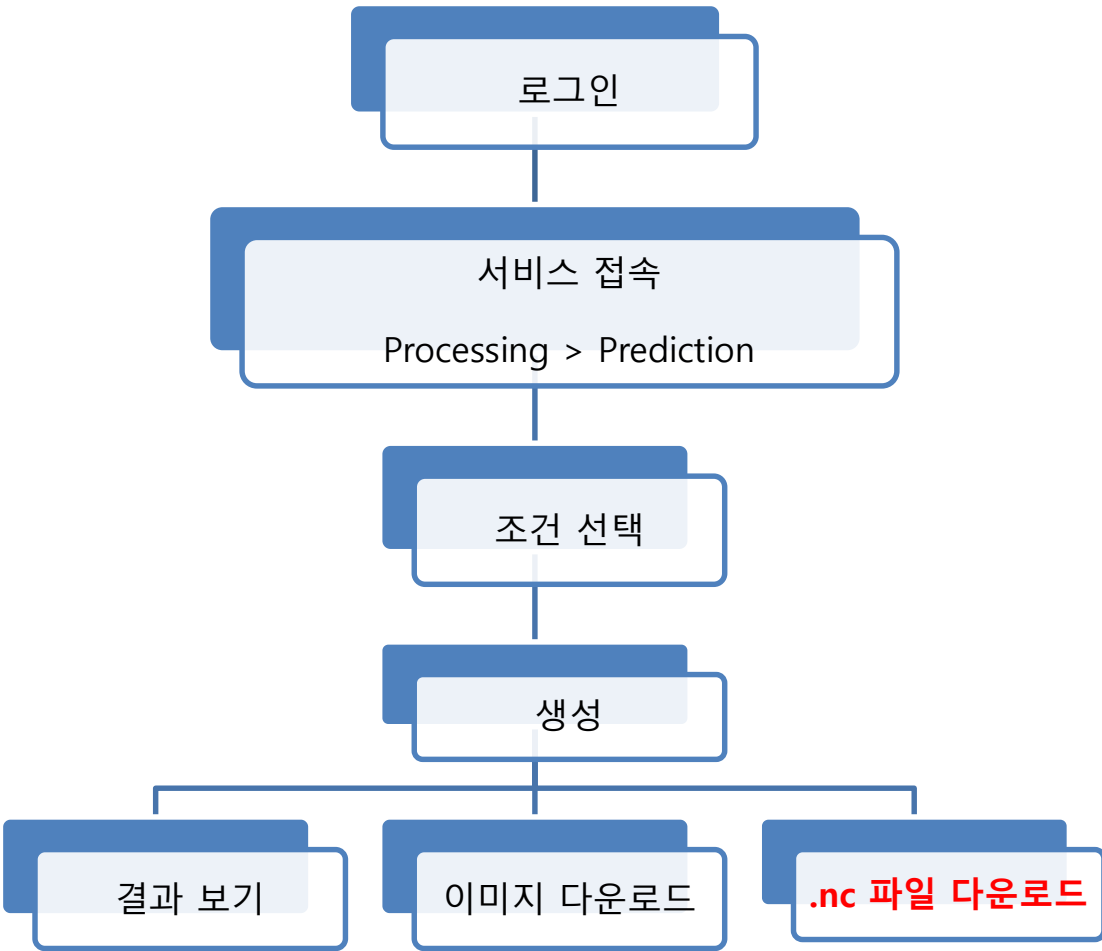
PREC (Precipitation) SLP (Sea Level Pressure) JUL 2023

T2M (Temperature at 2m) T850 (Temperature at 850hPa) Geopotential height at 500hPa for JUL 2023

3-MON_FORECAST_SCM_MME_OUT_FIG_MONTHLY_prec_7.png
 3-MON_FORECAST_SCM_MME_OUT_FIG_MONTHLY_prec_8.png
 3-MON_FORECAST_SCM_MME_OUT_FIG_MONTHLY_prec_9.png
 3-MON_FORECAST_SCM_MME_OUT_FIG_MONTHLY_slp_7.png
 3-MON_FORECAST_SCM_MME_OUT_FIG_MONTHLY_slp_8.png
 3-MON_FORECAST_SCM_MME_OUT_FIG_MONTHLY_slp_9.png
 3-MON_FORECAST_SCM_MME_OUT_FIG_MONTHLY_sst_7.png
 3-MON_FORECAST_SCM_MME_OUT_FIG_MONTHLY_sst_8.png
 3-MON_FORECAST_SCM_MME_OUT_FIG_MONTHLY_sst_9.png
 3-MON_FORECAST_SCM_MME_OUT_FIG_MONTHLY_t2m_7.png
 3-MON_FORECAST_SCM_MME_OUT_FIG_MONTHLY_t2m_8.png
 3-MON_FORECAST_SCM_MME_OUT_FIG_MONTHLY_t2m_9.png
 3-MON_FORECAST_SCM_MME_OUT_FIG_MONTHLY_t850_7.png
 3-MON_FORECAST_SCM_MME_OUT_FIG_MONTHLY_t850_8.png
 3-MON_FORECAST_SCM_MME_OUT_FIG_MONTHLY_t850_9.png
 3-MON_FORECAST_SCM_MME_OUT_FIG_MONTHLY_u200_7.png
 3-MON_FORECAST_SCM_MME_OUT_FIG_MONTHLY_u200_8.png
 3-MON_FORECAST_SCM_MME_OUT_FIG_MONTHLY_u200_9.png
 3-MON_FORECAST_SCM_MME_OUT_FIG_MONTHLY_u850_7.png
 3-MON_FORECAST_SCM_MME_OUT_FIG_MONTHLY_u850_8.png
 3-MON_FORECAST_SCM_MME_OUT_FIG_MONTHLY_u850_9.png
 3-MON_FORECAST_SCM_MME_OUT_FIG_MONTHLY_uv200_7.png
 3-MON_FORECAST_SCM_MME_OUT_FIG_MONTHLY_uv200_8.png
 3-MON_FORECAST_SCM_MME_OUT_FIG_MONTHLY_uv200_9.png
 3-MON_FORECAST_SCM_MME_OUT_FIG_MONTHLY_uv850_7.png
 3-MON_FORECAST_SCM_MME_OUT_FIG_MONTHLY_uv850_8.png
 3-MON_FORECAST_SCM_MME_OUT_FIG_MONTHLY_uv850_9.png
 3-MON_FORECAST_SCM_MME_OUT_FIG_MONTHLY_v200_7.png
 3-MON_FORECAST_SCM_MME_OUT_FIG_MONTHLY_v200_8.png
 3-MON_FORECAST_SCM_MME_OUT_FIG_MONTHLY_v200_9.png
 3-MON_FORECAST_SCM_MME_OUT_FIG_MONTHLY_v850_7.png
 3-MON_FORECAST_SCM_MME_OUT_FIG_MONTHLY_v850_8.png
 3-MON_FORECAST_SCM_MME_OUT_FIG_MONTHLY_v850_9.png
 3-MON_FORECAST_SCM_MME_OUT_FIG_MONTHLY_z500_7.png
 3-MON_FORECAST_SCM_MME_OUT_FIG_MONTHLY_z500_8.png
 3-MON_FORECAST_SCM_MME_OUT_FIG_MONTHLY_z500_9.png

4. [실습] 사용자 맞춤형 계절예측 및 검증 실습 | Prediction 서비스

| Prediction 시작하기 - 16 (Monthly nc 파일 다운로드)



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Prediction

Notice : A new user-customized APCC seasonal prediction (MME) and verification services based on platform technology has been opened as beta service (Refer to current APCC CLIK service : <https://clik.apcc21.org>). Please leave your any questions and feedbacks about the new service to APCC Help Desk.

Lead Month: 3-MON | Periods: Seasonal Monthly | Year / Season: 2023 7 | Methods: Deterministic Probabilistic

Models:

- ALL
- APCC_SCOPS
- BOM_ACCESS51
- CMCC_SPS3.5
- ECC_CCA
- NCEP_CFSv2
- PNU-RDA_GCMv2.0
- UKMO

3-MON_FORECAST_SCM_MME_OUT_DATA_MONTHLY_prec.nc
 3-MON_FORECAST_SCM_MME_OUT_DATA_MONTHLY_slp.nc
 3-MON_FORECAST_SCM_MME_OUT_DATA_MONTHLY_sst.nc
 3-MON_FORECAST_SCM_MME_OUT_DATA_MONTHLY_t2m.nc
 3-MON_FORECAST_SCM_MME_OUT_DATA_MONTHLY_t850.nc
 3-MON_FORECAST_SCM_MME_OUT_DATA_MONTHLY_u200.nc
 3-MON_FORECAST_SCM_MME_OUT_DATA_MONTHLY_u850.nc
 3-MON_FORECAST_SCM_MME_OUT_DATA_MONTHLY_v200.nc
 3-MON_FORECAST_SCM_MME_OUT_DATA_MONTHLY_v850.nc
 3-MON_FORECAST_SCM_MME_OUT_DATA_MONTHLY_z500.nc

Predict

Download (.png) **Download (.nc)**

First Month Second Month Third Month

PREC (Precipitation) **SLP (Sea Level Pressure)** **SST (Sea Surface Temperature)**

Precipitation for JUL 2023
 Sea Level Pressure for JUL 2023
 Sea Surface temperature for JUL 2023

T2M (Temperature at 2m) **T850 (Temperature at 850hPa)** **Z500 (Geopotential Height at 500hPa)**

Temperature at 2m for JUL 2023
 Temperature at 850hPa for JUL 2023
 Geopotential height at 500hPa for JUL 2023

Red arrow pointing to Download (.nc) button with text: .nc 파일 다운로드



실습

Prediction 실습 시나리오 1 (사용법 익히기)

- 2024년 7월의 전체 모델을 대상으로 Prediction 결과를 확인하세요.
- 원본 이미지 결과 확인, 파일 다운로드 (이미지, NC파일)
- 결과 공유 확인

Prediction 실습 시나리오 2

- 2024년 7월의 모델 중 원하는 모델을 선택하여 Prediction을 생성하고 결과를 확인하세요
(이미 생성되어 있는 결과가 아닌 새로 생성되는 조합을 찾아보세요)
(My Jobs 페이지 / 작업 완료 후 메일 확인)

| Verification – Overview



APCC 기후예측 검증

- 다중 모델 앙상블(Multi-Model Ensemble, MME) 기법에 기반
- 결정론적(Deterministic) 및 확률론적(Probability) 계절예측정보
- 3개월, 6개월 전망 제공
- 다양한 검증 기법을 통하여 예측정보의 계절적 특성 및 예측성에 대한 검증 정보도 제시

성공률 (Success Rate, SR)

- 시도 횟수 중 성공의 비율 또는 백분율
 - ~ 0.33 : Poor skill region
 - 0.33 ~ 0.66 : Reasonable skill region
 - 0.66 ~ : High skill region

이상상관계수 (Anomaly Correlation Coefficient, ACC)

- 특정 시간에 대한 기후평년값 대비 예측 편차값(Anomaly)이 관측과 공간적으로 얼마나 유사한지 평가하는 척도
- 기후평년값은 장기간 일별, 순별, 월별, 년별로 평균한 값을 의미하며, 세계 기상기구(WMO)에서는 30년 기간을 권고
- ACC는 최하 -1.0부터 최대 +1.0의 값의 범위로 +1.0에 가까울수록 관측과 공간분포의 유사성이 크다고 할 수 있음

HSS (Heidke Skill Score)

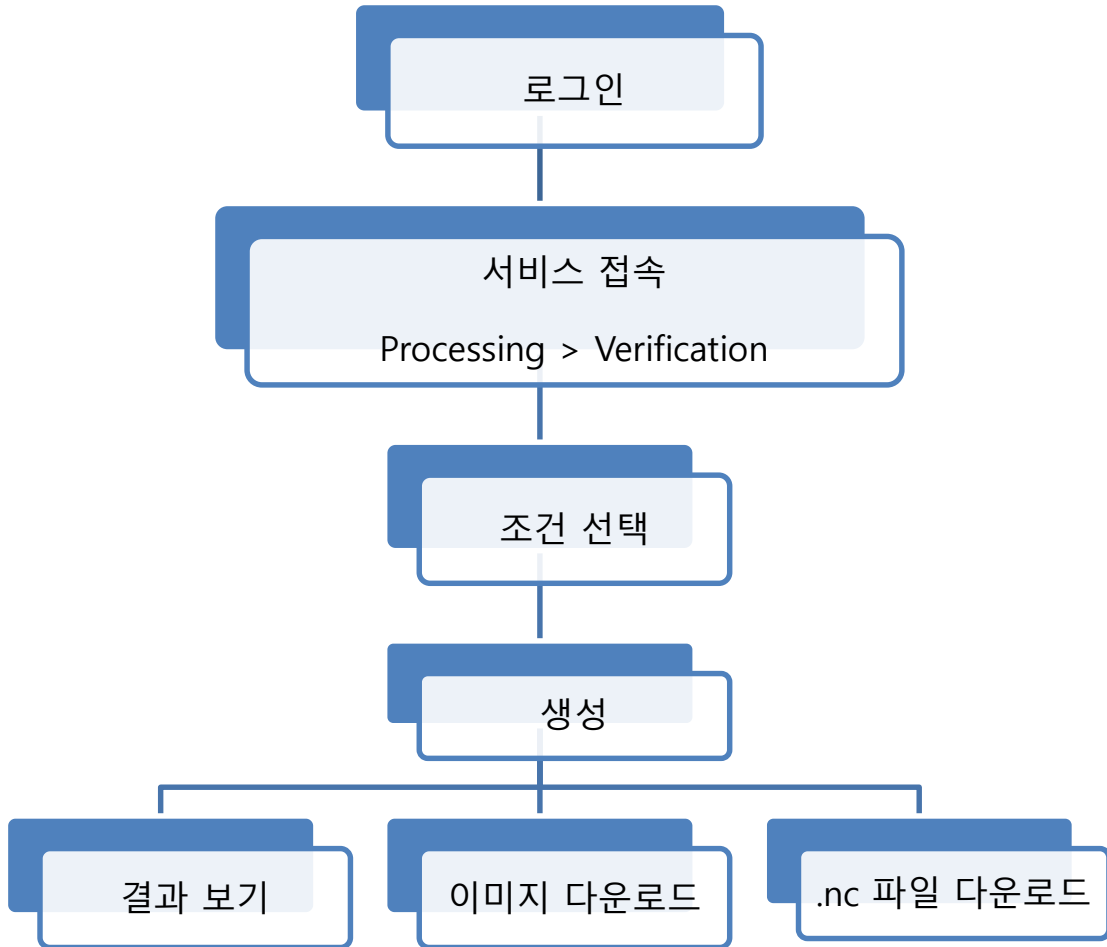
- 확률론적 계절예측의 카테고리에 대하여 정확히 예측된 값과 적중된 값(횟수)을 구분하여 평가하는 척도
- HSS는 100에 가까울수록 완벽한 예측을 나타내고, -50에 가까울수록 오적중 예측임을 의미

ROC (Relative Operating Characteristics) Curve

- ROC는 확률론적 계절예측의 카테고리에 대하여 관측 대비 적중률 (Hit Rate, HR) 과 오적중률(False-Alarm Rate, FAR)을 비교 평가하는 척도
- ROC는 0과 1의 값의 범위를 가지며 곡선의 완만한 정도가 45° (ROC가 0.5 이하)와 가까울수록 예측력이 없다고 평가할 수 있으며, 곡선의 굴곡이 클수록 (ROC가 1에 가까울수록) 예측력이 높다가 평가할 수 있음

4. [실습] 사용자 맞춤형 계절예측 및 검증 실습 | Verification 서비스

| Verification 시작하기 - 1 (Verification 페이지 접속)



Climate Information toolKit (CLIK) Home Dataset Processing CLIK API Documents Help Desk Member

Verification

Notice : A new user-customized APCC seasonal prediction (MME) and verification services based on platform technology has been opened as beta service (Refer to current APCC CLIK service : <https://clik.apcc21.org>). Please leave your any questions and feedbacks about the new service to APCC Help Desk.

Lead Month

3-MON

Year / Month

2023 7

Skills

Success Rate ACC HSS ROC Curve

Variable

prec slp sst t2m t850 z500

Models

ALL

APCC_SCOPS BOM_ACCESS-S2 CMCC_SPS3.5 ECCS_CANSIPsv2.1 KMA_GLOSEA6GC3.2 METFR_SYS8 NASA_GEOS-S2S-2.1

NCEP_CFSv2 PNU-RDA_CGCMv2.0 UKMO_GLOSEA6

Verify

Download (.png)

Download (.nc)

Please login.

Success Rate(SR)

SR is the fraction or percentage of success among a number of attempts. CLIK provides a simple success rate as the DMME verification score.

- ~ 0.33 : Poor skill region
- 0.33 ~ 0.66 : Reasonable skill region
- 0.66 ~ : High skill region

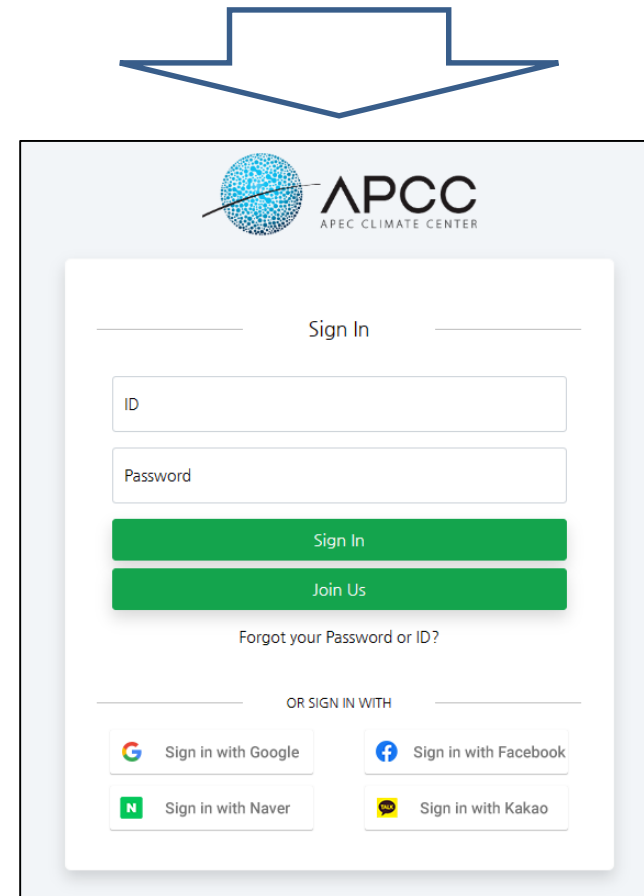
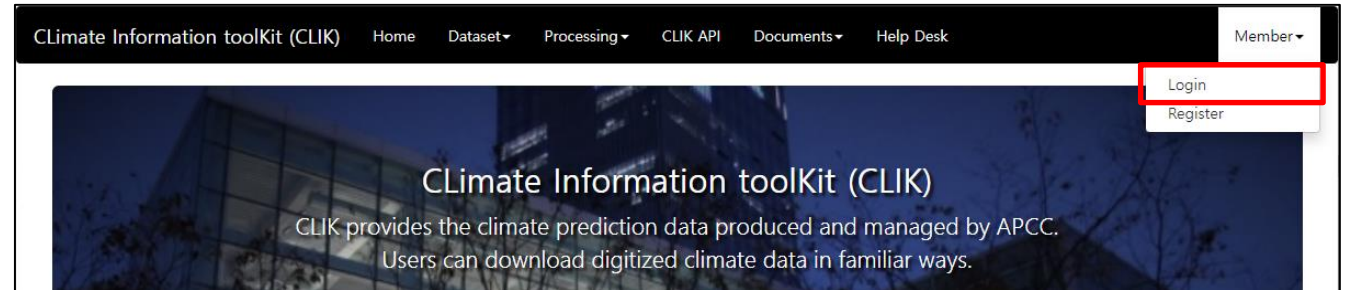
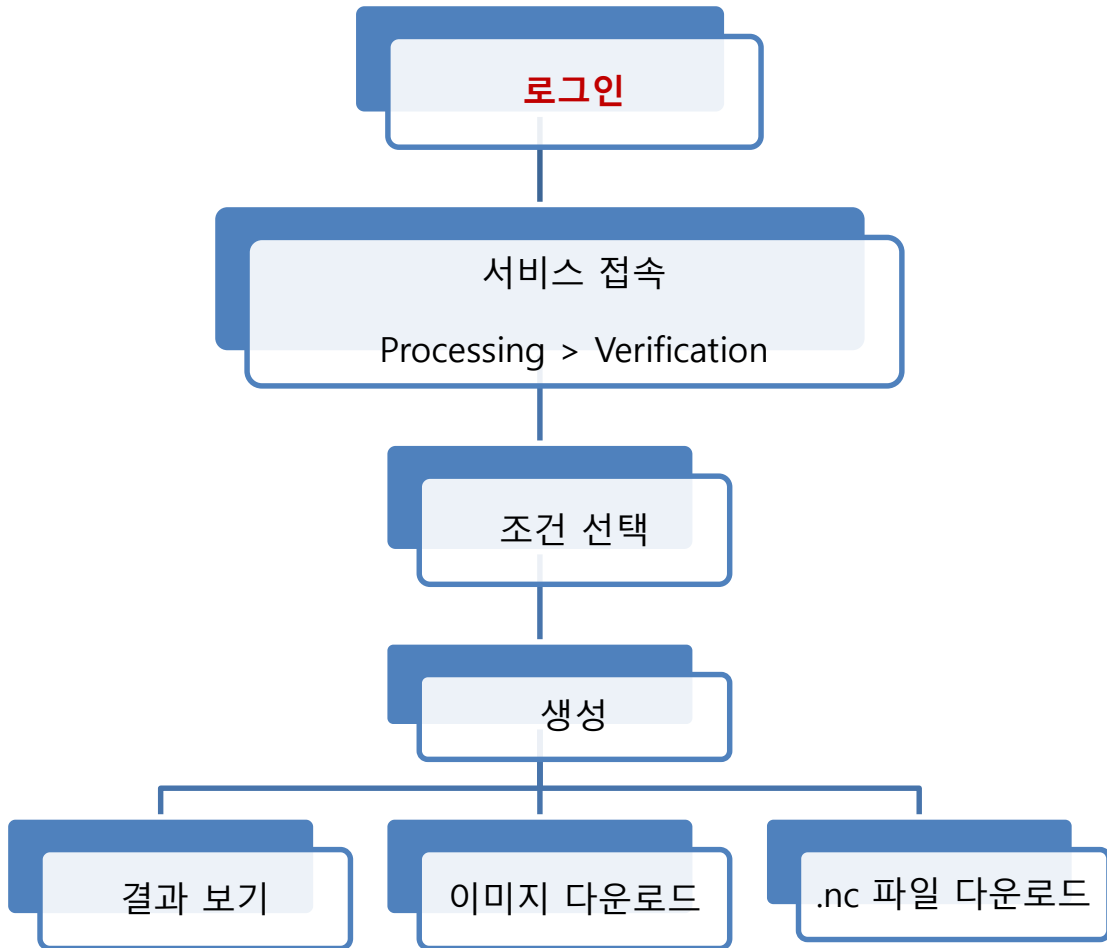
Anomaly Correlation Coefficient(ACC)

ACC is one of the most widely used measures in the verification of spatial fields and is the correlation between anomalies of forecasts and those of verifying values with the reference values, such as climatological values.

Heidke Skill Score(HSS)

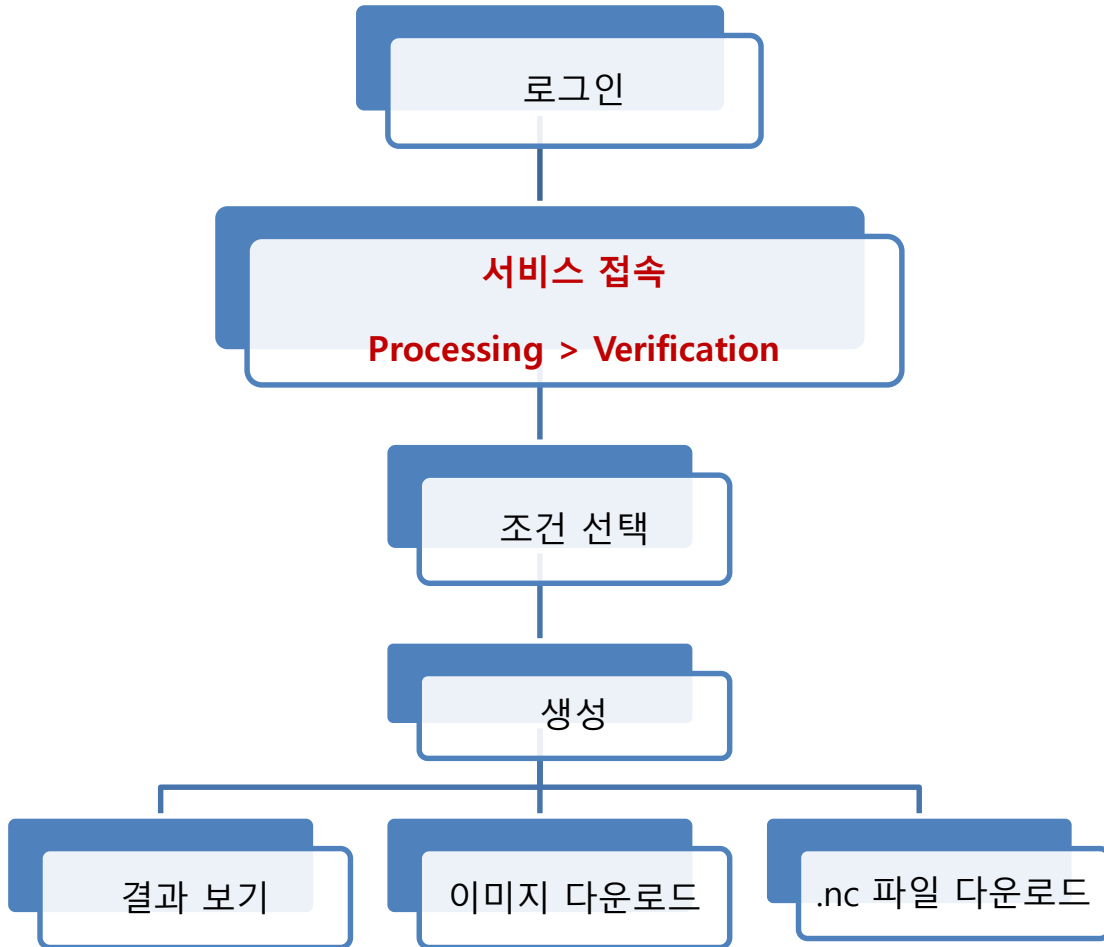
HSS is commonly used skill score for the verification of categorical probabilistic forecast. Measuring the fractional improvement of the forecast over random forecast.

| Verification 시작하기 - 2 (로그인)



4. [실습] 사용자 맞춤형 계절예측 및 검증 실습 | Verification 서비스

| Verification 시작하기 – 3 (Verification 페이지 접속)



The screenshot shows the 'Verification' page in the Climate Information toolKit (CLIK). The page includes a navigation bar with 'Home', 'Dataset', 'Processing', 'My Jobs', 'CLIK API', 'Documents', 'Help Desk', and 'Member'. A notice at the top states: "Notice : A new user-customized APCC seasonal prediction (MME) and verification services based on platform technology has been opened as beta service (Refer to current APCC CLIK service : <https://clik.apcc21.org>). Please leave your any questions and feedbacks about the new service to APCC Help Desk."

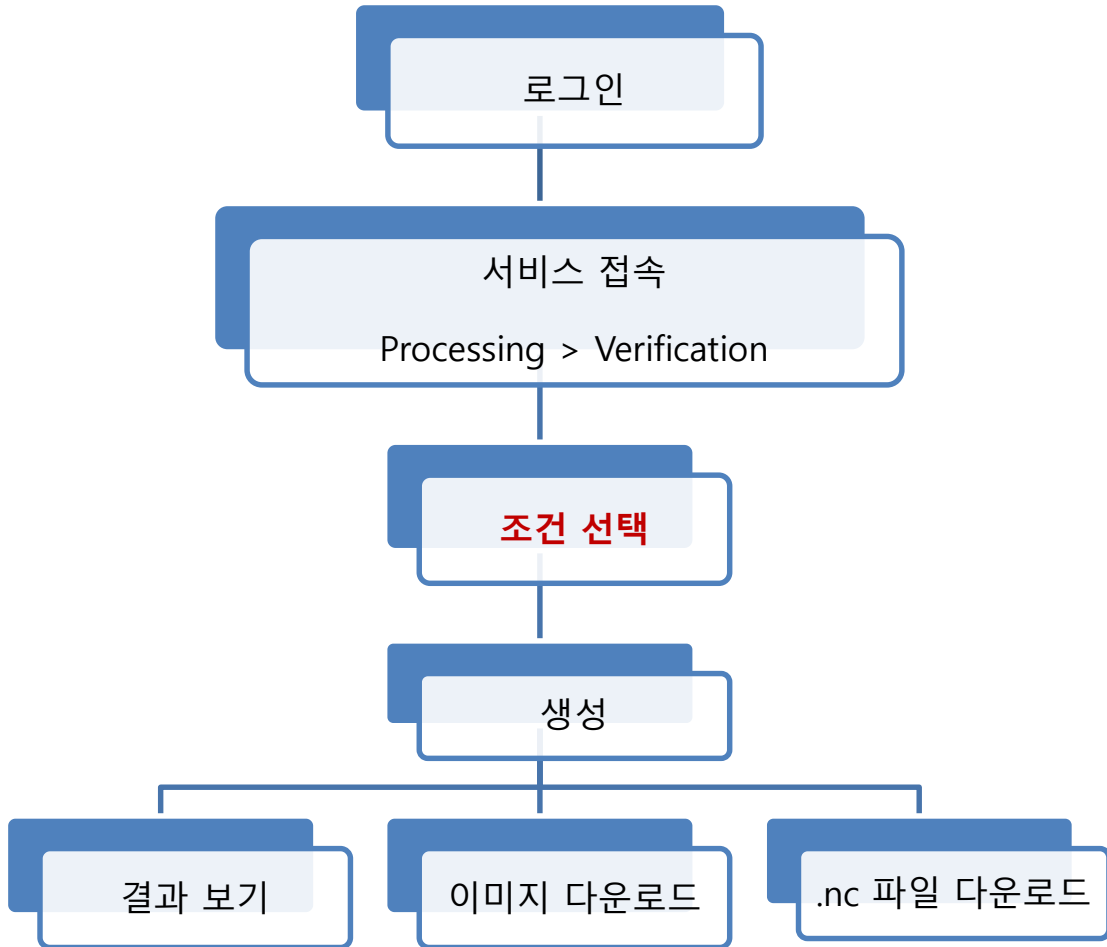
The main content area contains several sections:

- Lead Month:** A dropdown menu set to '3-MON'.
- Year / Month:** Two dropdown menus set to '2023' and '7'.
- Skills:** Radio buttons for 'Success Rate' (selected), 'ACC', 'HSS', and 'ROC Curve'.
- Variable:** Radio buttons for 'prec', 'slp', 'sst', 't2m', 't850', and 'z500'.
- Models:** A list of model checkboxes including 'ALL', 'APCC_SCOPS', 'BOM_ACCESS-S2', 'CMCC_SPS3.5', 'ECCC_CANSIPsv2.1', 'KMA_GLOSEA6GC3.2', 'METFR_SYS8', 'NASA_GEOS-S2S-2.1', 'NCEP_CFSv2', 'PNU-RDA_CGCMv2.0', and 'UKMO_GLOSEA6'.
- Buttons:** A 'Verify' button (highlighted with a red box) and two 'Download (.png)' and 'Download (.nc)' buttons.

Below the form, there are three informational sections:

- Success Rate(SR):** SR is the fraction or percentage of success among a number of attempts. CLIK provides a simple success rate as the DMME verification score.
 - ~ 0.33 : Poor skill region
 - 0.33 ~ 0.66 : Reasonable skill region
 - 0.66 ~ : High skill region
- Anomaly Correlation Coefficient(ACC):** ACC is one of the most widely used measures in the verification of spatial fields and is the correlation between anomalies of forecasts and those of verifying values with the reference values, such as climatological values.
- Heidke Skill Score(HSS):** HSS is commonly used skill score for the verification of categorical probabilistic forecast. Measuring the fractional improvement of the forecast over random forecast.
- Relative Operating Characteristics(ROC) Curve:** The ROC curve indicates the degree of correct probabilistic discrimination in a set of forecasts. Discrimination is the ability to distinguish one

| Verification 시작하기 - 4 (조건 선택)



Climate Information toolKit (CLIK) Home Dataset Processing My Jobs CLIK API Documents Help Desk Member

Verification

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Lead Month: 3-MON

Year / Month: 2023 / 7

Skills: Success Rate ACC HSS ROC Curve

Variable: 원하는 변수를 선택

prec slp sst t2m t850 z500

Models: 원하는 모델을 선택

ALL
 APCC_SCOPS BOM_ACCESS-S2 CMCC_SPS3.5 ECCCS_CANSIPsv2.1 KMA_GLOSEA6GC3.2 METFR_SYS8 NASA_GEOS-S2S-2.1
 NCEP_CFSv2 PNU-RDA_CGCMv2.0 UKMO_GLOSEA6

Verify

Download (.png) Download (.nc)

Success Rate(SR)
 SR is the fraction or percentage of success among a number of attempts. CLIK provides a simple success rate as the DMME verification score.

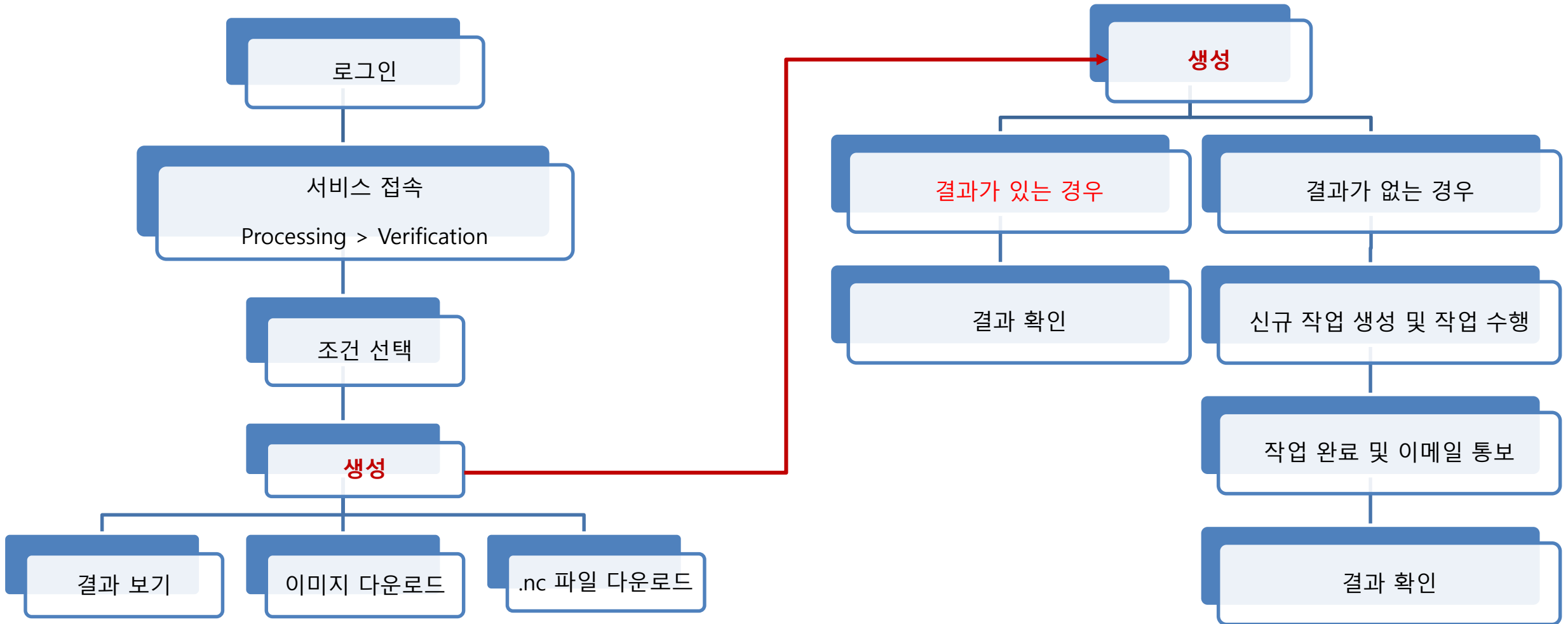
- ~ 0.33 : Poor skill region
- 0.33 ~ 0.66 : Reasonable skill region
- 0.66 ~ : High skill region

Anomaly Correlation Coefficient(ACC)
 ACC is one of the most widely used measures in the verification of spatial fields and is the correlation between anomalies of forecasts and those of verifying values with the reference values, such as climatological values.

Heidke Skill Score(HSS)
 HSS is commonly used skill score for the verification of categorical probabilistic forecast. Measuring the fractional improvement of the forecast over random forecast.

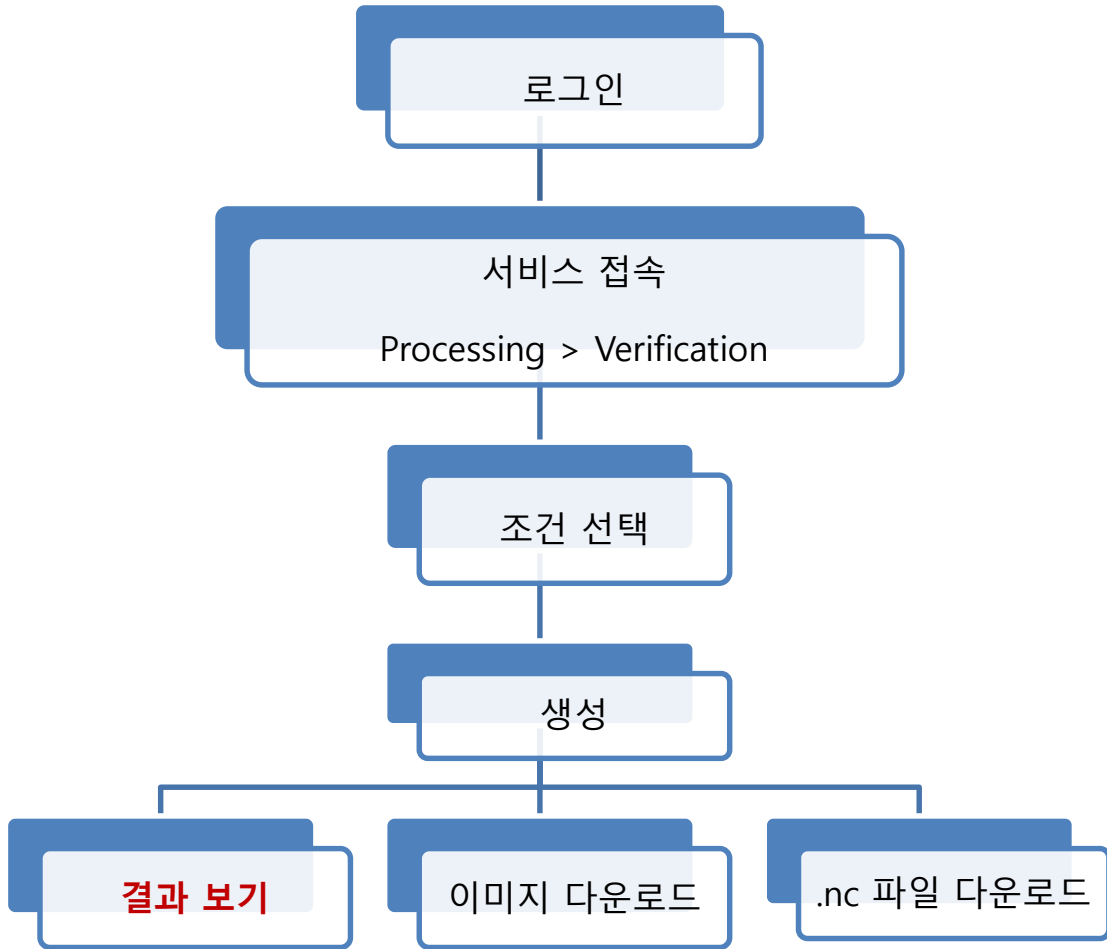
Relative Operating Characteristics(ROC) Curve
 The ROC curve indicates the degree of correct probabilistic discrimination in a set of forecasts. Discrimination is the ability to distinguish one

| Verification 시작하기 - 5 (생성 과정)



4. [실습] 사용자 맞춤형 계절예측 및 검증 실습 | Verification 서비스

| Verification 시작하기 - 6 (동일한 결과가 있는 경우)



CLimate Information toolKit (CLIK) Home Dataset Processing My Jobs CLIK API Documents Help Desk Member

Verification

Notice : A new user-customized APCC seasonal prediction (MME) and verification services based on platform technology has been opened as beta service (Refer to current APCC CLIK service : <https://clik.apcc21.org>). Please leave your any questions and feedbacks about the new service to APCC Help Desk.

Lead Month: 3-MON Year / Month: 2023 / 7 Skills: Success Rate ACC HSS ROC Curve

Variable: prec slp sst t2m t850 z500

Models: ALL APCC_SCOPS BOM_ACCESS-S2 CMCC_SPS3.5 ECCC_CANSIPSv2.1 KMA_GLOSEA6GC3.2 METFR_SYS8 NASA_GEOS-S2S-2.1 NCEP_CFSv2 PNU-RDA_CGCMv2.0 UKMO_GLOSEA6

Verify (highlighted)

Download (.png) Download (.nc)

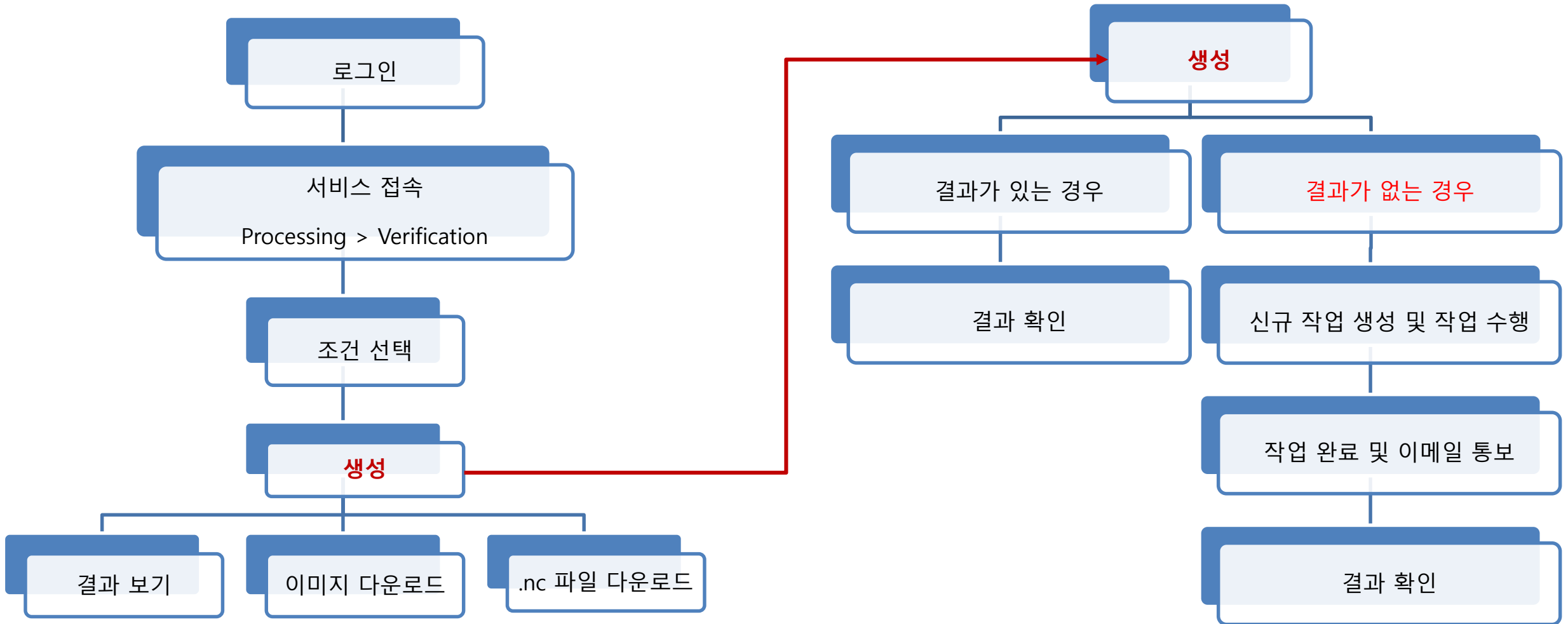
PREC (Precipitation)

Anomaly Correlation Coeff. : PREC, JAS (1991-2013)

Model	ACC
APCC_SCOPS	0.40
BOM_ACCESS-S2	0.45
CMCC_SPS3.5	0.42
ECCC_CANSIPSv2.1	0.20
KMA_GLOSEA6GC3.2	0.55
METFR_SYS8	0.50

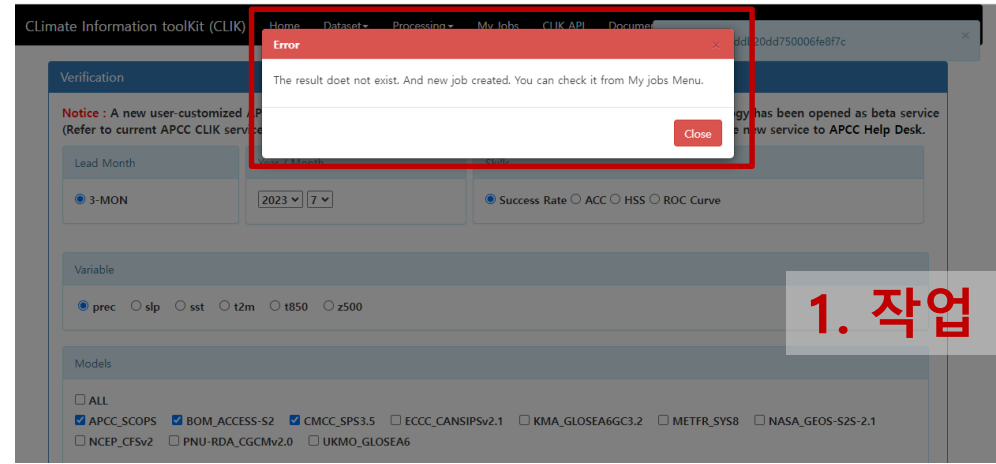
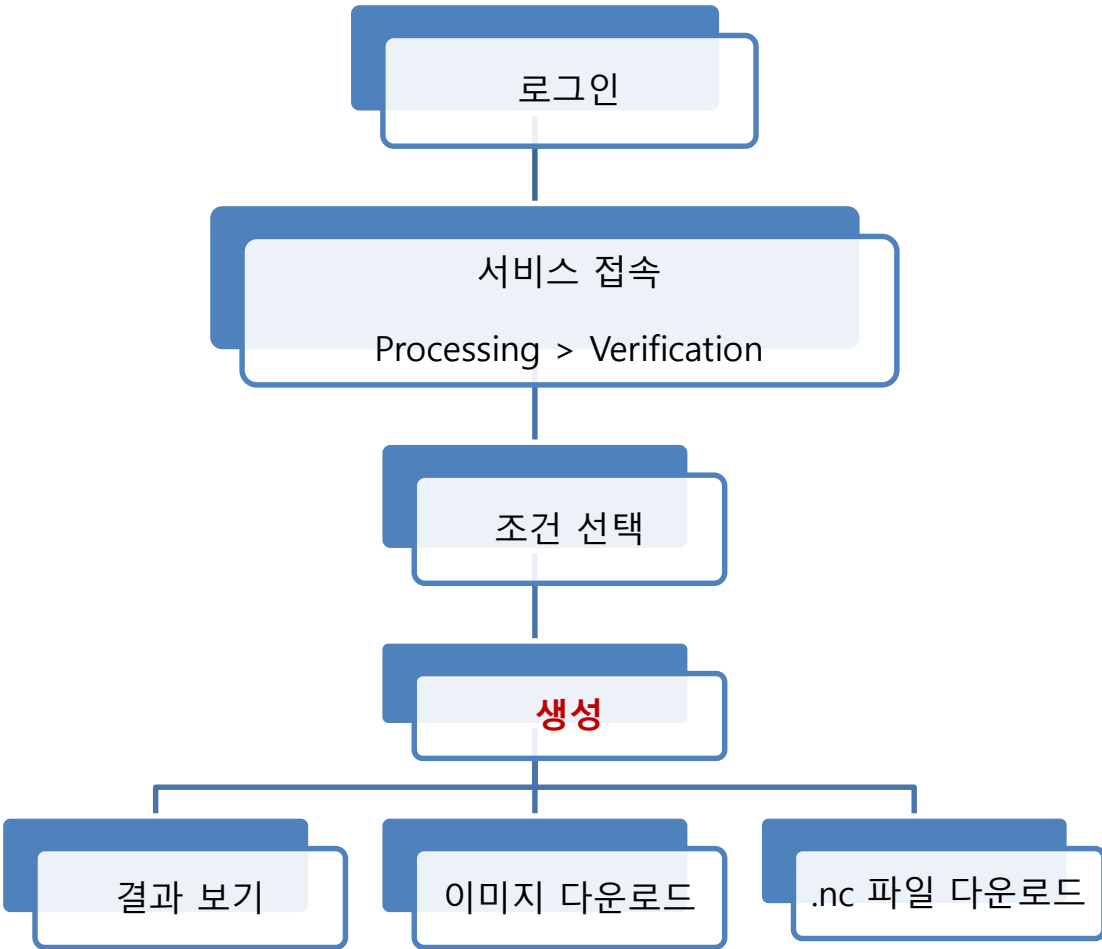
사용자간 작업 결과 공유

| Verification 시작하기 - 7 (생성 과정)



4. [실습] 사용자 맞춤형 계절예측 및 검증 실습 | Verification 서비스

| Verification 시작하기 - 8 (동일한 결과가 없는 경우)



1. 작업 요청

2 생성 작업 확인

Job type	Submission date	End date	Status
Verification	2023-07-07 10:43:55		Running
Prediction	2023-07-06 19:02:59	2023-07-06 19:10:38	Download View
Prediction	2023-07-06 19:02:45	2023-07-06 19:08:52	Download View

4. 다운로드 / 결과확인

제목 : Notification of job status (APCC) ☆

보낸사람 : APCC <support@apcc21.org>
받는사람 : '김상철' <scslow@apcc21.org>

Your job (635616cfd8075e0006691062) was completed. Please check the [\[My Jobs\]](#) of the homepage, and [download](#) results.

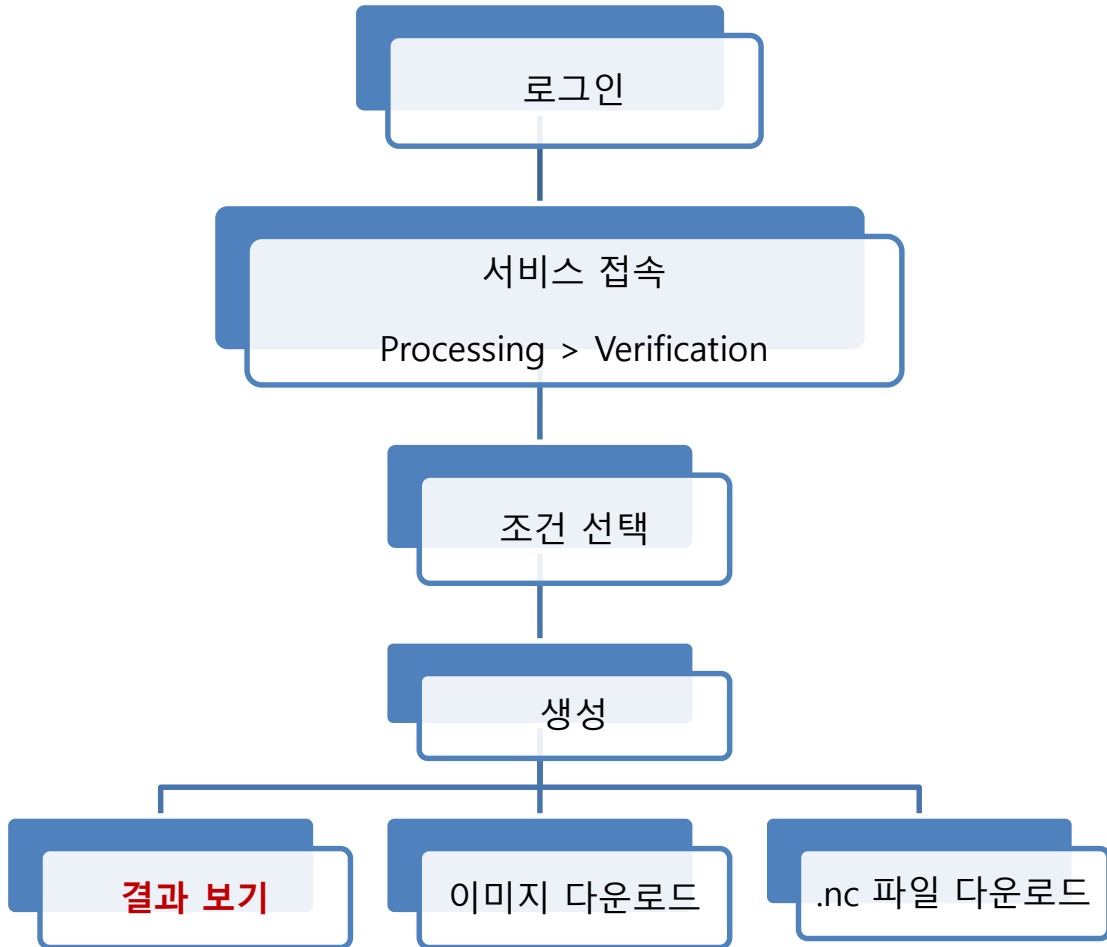
If you have any question, please use [APCC Help desk](#).

APCC Homepage: <https://www.apcc21.org>
CLIKs Homepage: <https://cliks.apcc21.org>

Job type	Submission date	End date	Status
Verification	2023-07-07 11:06:37	2023-07-07 11:10:42	Download View
Prediction	2023-07-07 10:52:59	2023-07-07 10:58:10	Download View
Verification	2023-07-07 10:43:55	2023-07-07 11:05:49	Download View

3 생성 작업 완료 메일

| Verification 시작하기 - 9 (동일한 결과가 없는 경우)



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Verification

Notice : A new user-customized APCC seasonal prediction (MME) and verification services based on platform technology has been opened as beta service (Refer to current APCC CLIK service : <https://clik.apcc21.org>). Please leave your any questions and feedbacks about the new service to APCC Help Desk.

Lead Month: 3-MON Year / Month: 2023 / 7 Skills: Success Rate ACC HSS ROC Curve

Variable: prec slp sst t2m t850 z500

Models: ALL APCC_SCOPS BOM_ACCESS-S2 CMCC_SPS3.5 ECC_CANSIPSv2.1 KMA_GLOSEA6GC3.2 METFR_SYS8 NASA_GEOS-S2S-2.1 NCEP_CFSv2 PNU-RDA_CGCMv2.0 UKMO_GLOSEA6

Verify Download (.png) Download (.nc)

PREC (Precipitation)

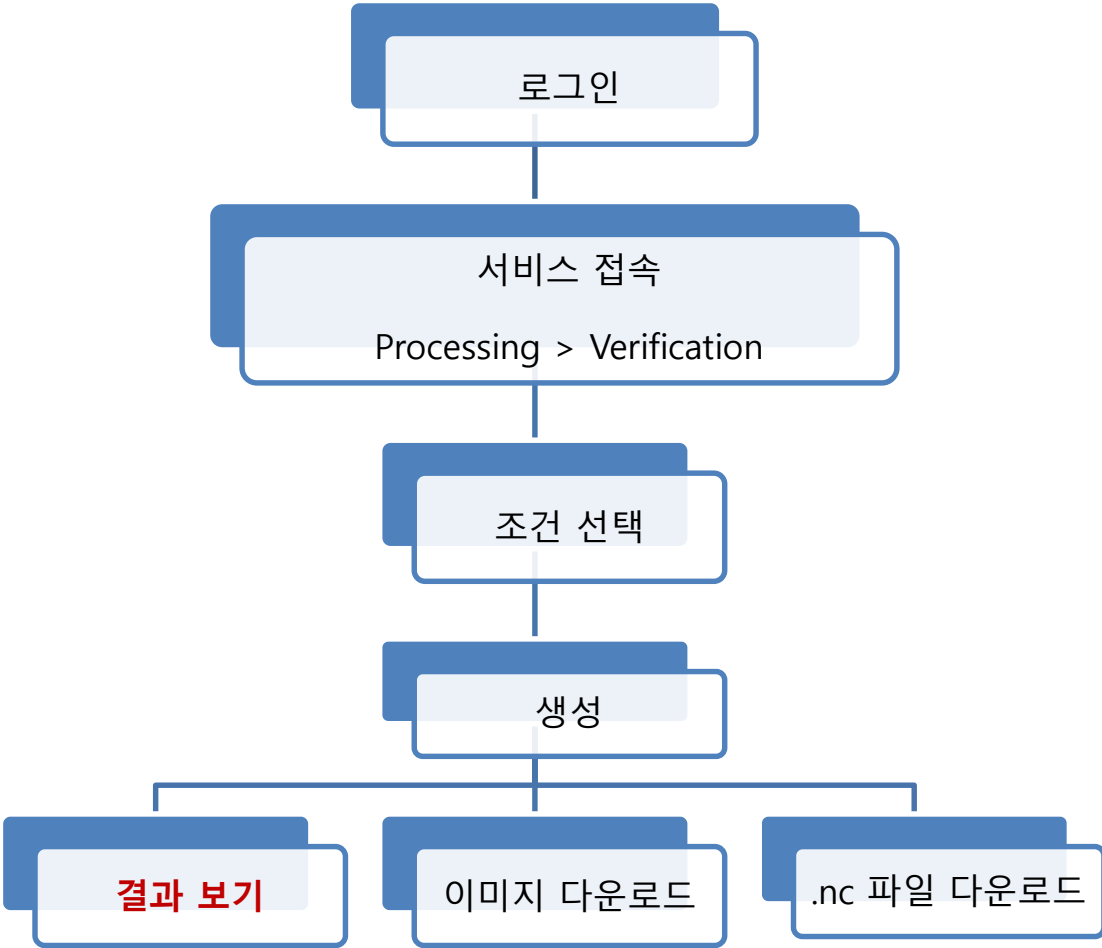
Anomaly Correlation Coeff. : PREC, JAS (1991-2013)

Model	ACC
APCC_SCOPS	0.40
BOM_ACCESS-S2	0.45
CMCC_SPS3.5	0.42
ECC_CANSIPSv2.1	0.20
KMA_GLOSEA6GC3.2	0.55
METFR_SYS8	0.50

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4. [실습] 사용자 맞춤형 계절예측 및 검증 실습 | Verification 서비스

| Verification 시작하기 - 9 (결과 이미지 클릭)



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Verification

Notice : A new user-customized APCC seasonal prediction (MME) and verification services based on platform technology has been opened as beta service (Refer to current APCC CLIK service : <https://clik.apcc21.org>). Please leave your any questions and feedbacks about the new service to APCC Help Desk.

Lead Month: 3-MON Year / Month: 2023 / 7

Variable: prec slp sst t2m t850 z500

Models: ALL APCC_SCOPS BOM_ACCESS-S2 CMCC_SPS3.5 ECCM... NCEP_CFSv2 PNU-RDA_GCMv2.0 UKMO_GLOSEA6

Verify Download (.png) Download (.nc)

일본 사이트 (Red arrow pointing to the download buttons)

Anomaly Correlation Coeff. : PREC, JAS (1991-2013)

Region	ACC
Globe	0.40
N.Eurpasia	0.18
S.Eurpasia	0.18
Tropics	0.45
E.Asia	0.20
S.Asia	0.42
N.America	0.30
S.America	0.18
Australasia	0.55
Aus. S.Pacific	0.50
N.EurAsia	0.05
M.East	0.20

PREC (Precipitation)

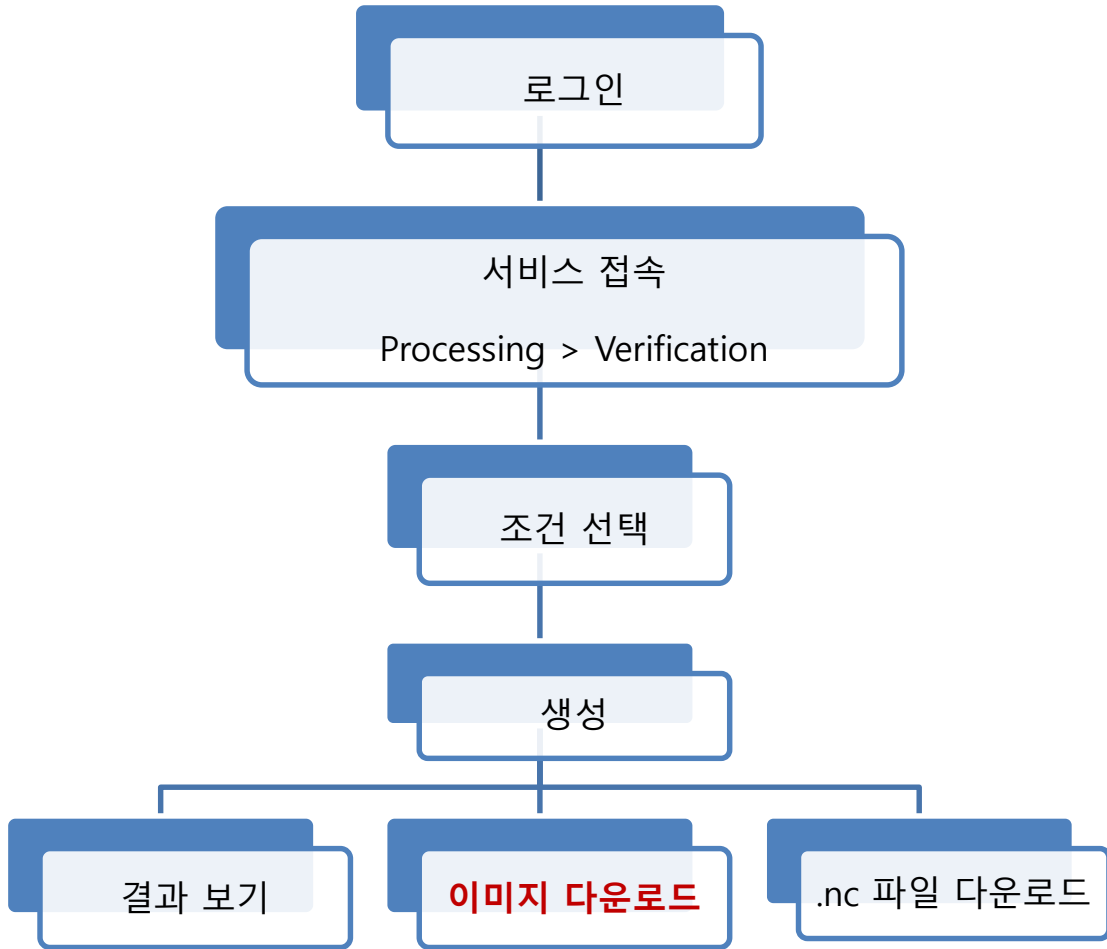
Anomaly Correlation Coeff. : PREC, JAS (1991-2013)

Region	ACC
Globe	0.40
N.Eurpasia	0.18
S.Eurpasia	0.18
Tropics	0.45
E.Asia	0.20
S.Asia	0.42
N.America	0.30
S.America	0.18
Australasia	0.55
Aus. S.Pacific	0.50
N.EurAsia	0.05
M.East	0.20

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4. [실습] 사용자 맞춤형 계절예측 및 검증 실습 | Verification 서비스

| Verification 시작하기 - 10 (이미지 다운로드)



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Verification

Notice : A new user-customized APCC seasonal prediction (MME) and verification services based on platform technology has been opened as beta service (Refer to current APCC CLIK service : <https://clik.apcc21.org>). Please leave your any questions and feedbacks about the new service to APCC Help Desk.

Lead Month: 3-MON Year / Month: 2023 / 7 Skills: Success Rate ACC HSS ROC Curve

Variable: prec slp sst t2m t850 이름

Models: 3-MON_HINDCAST_SCM_CVS_FIG_ACC_SEASONAL_prec.ACC_seasonal.landsea.png

ALL APCC_SCOPS BOM S2 CMCC_SPS3.5 ECCS_CANSIPSv2.1 KMA_GLOSEA6GC3.2 METFR_SYS8 NASA_GEOS-S2S-2.1 NCEP_CFSv2 A_GGSM2.0 UKMO_GLOSEA6

Verify

PREC (Precipitation)

Anomaly Correlation Coeff. : PREC, JAS (1991-2013)

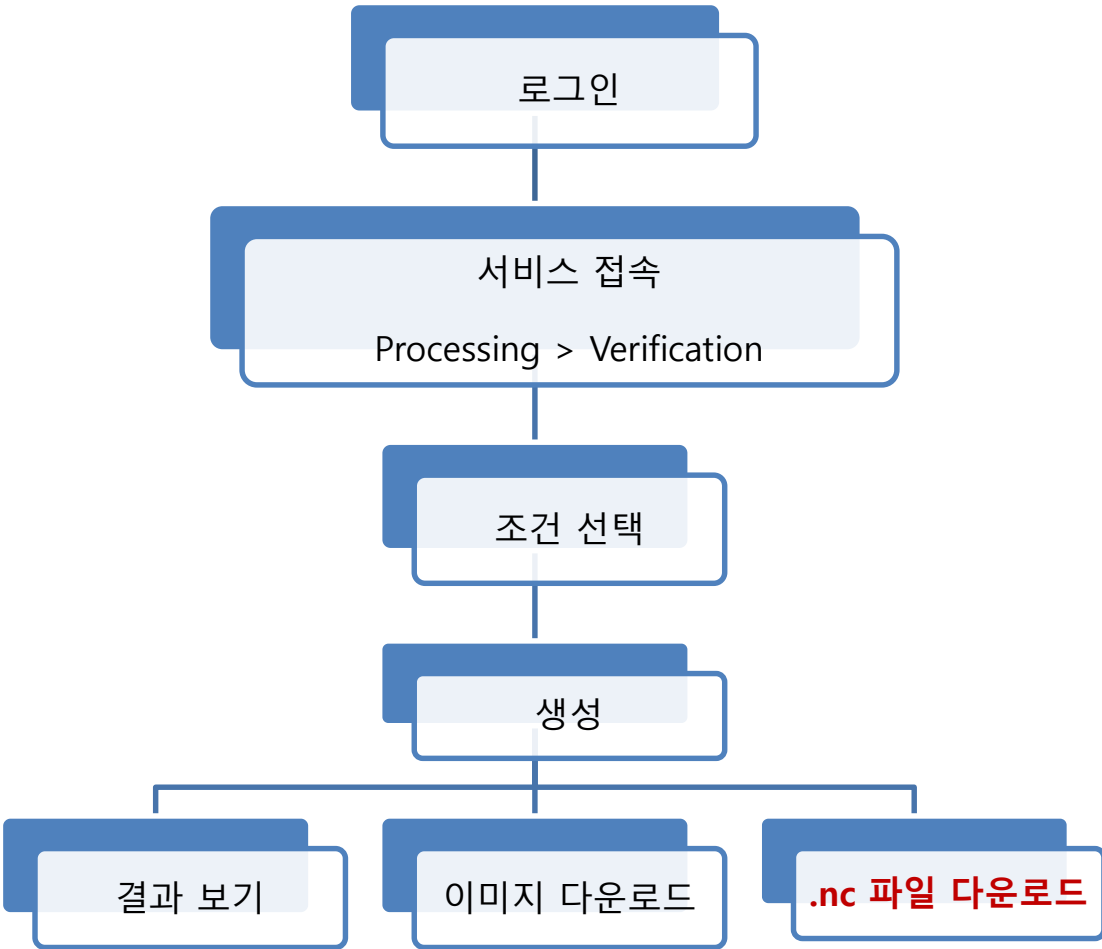
The bar chart displays the Anomaly Correlation Coefficient (ACC) for precipitation (PREC) during the July-August-September (JAS) season from 1991 to 2013. The y-axis represents the ACC, ranging from 0.0 to 1.0. The x-axis lists the models used for verification. The ACC values for the models are approximately: APCC_SCOPS (0.4), BOM (0.45), S2 (0.42), CMCC_SPS3.5 (0.3), ECCS_CANSIPSv2.1 (0.55), KMA_GLOSEA6GC3.2 (0.5), METFR_SYS8 (0.5), and NASA_GEOS-S2S-2.1 (0.5).

APCC

APEC CLIMATE CENTER

4. [실습] 사용자 맞춤형 계절예측 및 검증 실습 | Verification 서비스

| Verification 시작하기 - 11 (.nc 파일 다운로드)



CLimate Information toolKit (CLIK) Home Dataset Processing My Jobs CLIK API Documents Help Desk Member

Verification

Notice : A new user-customized APCC seasonal prediction (MME) and verification services based on platform technology has been opened as beta service (Refer to current APCC CLIK service : <https://clik.apcc21.org>). Please leave your any questions and feedbacks about the new service to APCC Help Desk.

Lead Month: 3-MON Year / Month: 2023 / 7 Skills: Success Rate ACC HSS ROC Curve

Variable: prec slp sst t2m t850 z500

Models: 이름 3-MON_HINDCAST_SCM_CVS_DATA_ACC_SEASONAL_prec.ACC_seasonal.landsea.nc

ALL APCC_SCOPS BOM_ACCESS-S2 CMCC_S2 ECCS_CANSIPsv2.1 KMA_GLOSEA6GC3.2 METFR_SYS8 NASA_GEOS-S2S-2.1 NCEP_CFSv2 PNU-RDA_GCM2.3 GLOSEA6

Verify

Download (.png) **Download (.nc)**

.nc 파일 다운로드

PREC (Precipitation)

Anomaly Correlation Coeff. : PREC, JAS (1991-2013)

Model	ACC
APCC_SCOPS	0.40
BOM_ACCESS-S2	0.45
CMCC_S2	0.42
ECCS_CANSIPsv2.1	0.20
KMA_GLOSEA6GC3.2	0.55
METFR_SYS8	0.50

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실습

Verification 실습 시나리오 1 (사용법 익히기)

- 2024년 7월의 전체 모델을 대상으로 ACC 기법으로 Precipitation 변수의 결과를 확인하세요
- 파일 다운로드 (이미지, NC파일)

Verification 실습 시나리오 2

- 2024년 7월의 원하는 모델을 선택하여 Verification의 조건을 선택하여 결과를 확인하세요
(이미 생성되어 있는 결과가 아닌 새로 생성되는 조합을 찾아보세요)
(My Jobs 페이지 / 작업 완료 후 메일 확인)



Thank You !!



Prediction 시작하기 - 6 (동일한 결과가 있는 경우)

Prediction & Verification 서비스의 결과 공유

- 기후서비스 통합 플랫폼에서 제공하고 있는 Prediction과 Verification 서비스의 경우 사용자가 요청한 작업 결과를 사용자간 공유를 하고 있음
- A 사용자가 생성한 결과를 B 사용자가 동일한 조건으로 요청을 하게 되면 A 사용자가 생성한 결과를 바로 보여줌
- 사용자가 선택한 조건에 따른 결과의 수가 정해져 있음

Prediction 서비스의 사용자 조건에 따른 경우의 수

조합 공식

$${}_n C_r = \frac{n!}{r!(n-r)!}$$

조합의 경우의 수를 구하는 공식. 조합은 n개 중 서로 다른 r개를 선택하되 순서를 고려하지 않는 것

선택 모델 수	1	2	3	4	5	6	7	8	9	10	합계
경우의 수	10	45	120	210	252	210	120	45	10	1	1,023

The screenshot shows the Prediction service configuration interface. It includes the following sections:

- Lead Month:** 3-MON
- Periods:** Seasonal (selected), Monthly. Labeled with a red '2개' (2 items).
- Year / Season:** 2023, 7
- Methods:** Deterministic (selected), Probabilistic. Labeled with a red '2개' (2 items).
- Models:** 10개 (10 items) selected. The list includes: APCC_SCOPS, BOM_ACCESS-S2, CMCC_SPS3.5, ECCS_CANSIPSv2.1, KMA_GLOSEA6G3.2, METFR_SYS8, NASA_GEOS-S2S-2.1, NCEP_CFSv2, PNU-RDA_CGCMv2.0, and UKMO_GLOSEA6.

경우의 수 계산

- 모델 10개일 경우 경우의 수 1,023건
- Prediction 서비스의 조건 중
 - Periods 2개 → 2,046건
 - Methods 2개 → 4,092건
- 최종 10개의 모델일 경우 최대 생성될 수 있는 건수는 4,092건

모델 12개의 경우 4,095 조합. 최대 16,380건

1개의 조합 계산 시 5분 -> 20,460분 -> 341시간 -> 약 14일



Verification 시작하기 - 6 (동일한 결과가 있는 경우)

Prediction & Verification 서비스의 결과 공유

- 기후서비스 통합 플랫폼에서 제공하고 있는 Prediction과 Verification 서비스의 경우 사용자가 요청한 작업 결과를 사용자간 공유를 하고 있음
 - A 사용자가 생성한 결과를 B 사용자가 동일한 조건으로 요청을 하게 되면 A 사용자가 생성한 결과를 바로 보여줌
- 사용자가 선택한 조건에 따른 결과의 수가 정해져 있음

Lead Month
 3-MON

Year / Month
2023 7

Skills
 Success Rate ACC HSS ROC Curve 4개

Variable
 prec slp sst t2m t850 z500 6개

Models
 ALL 10개
 APCC_SCOPS BOM_ACCESS-S2 CMCC_SPS3.5 ECCS_CANSIPsv2.1 KMA_GLOSEA6GC3.2 METFR_SYS8 NASA_GEOS-S2S-2.1
 NCEP_CFSv2 PNU-RDA_CGCMv2.0 UKMO_GLOSEA6

Verification 서비스의 사용자 조건에 따른 경우의 수

조합 공식

$${}_n C_r = \frac{n!}{r!(n-r)!}$$

조합의 경우의 수를 구하는 공식. 조합은 n개 중 서로 다른 r개를 선택하되 순서를 고려하지 않는 것

경우의 수 계산

- 모델 10개일 경우 경우의 수 1,023건
- Verification 서비스의 조건 중
 - Skills 4개 → 4,092건
 - Variable 6개 → 24,552건
- 최종 10개의 모델일 경우 최대 생성될 수 있는 건수는 24,552건
 모델 12개의 경우 4,095 조합. 최대 98,280건(1,023일)

선택 모델 수	1	2	3	4	5	6	7	8	9	10	합계
경우의 수	10	45	120	210	252	210	120	45	10	1	1,023

4. [실습] 사용자 맞춤형 계절예측 및 검증 실습 | Prediction 서비스



| Prediction 시작하기 - 4 (조건 선택-월별 모델 변경)

Lead Month <input checked="" type="radio"/> 3-MON	Periods <input checked="" type="radio"/> Seasonal <input type="radio"/> Monthly	Year / Season 2023 <input type="text"/> 7 <input type="text"/>	Methods <input checked="" type="radio"/> Deterministic <input type="radio"/> Probabilistic
--	--	---	---

Models

ALL

APCC_SCOPS BOM_ACCESS-S2 CMCC_SPS3.5 ECCC_CANSIPsv2.1 KMA_GLOSEA6GC3.2 METFR_SYS8 NASA_GEOS-S2S-2.1

NCEP_CFSv2 PNU-RDA_CGCMv2.0 UKMO_GLOSEA6

Lead Month <input checked="" type="radio"/> 3-MON	Periods <input checked="" type="radio"/> Seasonal <input type="radio"/> Monthly	Year / Season 2023 <input type="text"/> 6 <input type="text"/>	Methods <input checked="" type="radio"/> Deterministic <input type="radio"/> Probabilistic
--	--	---	---

Models

ALL

APCC_SCOPS BOM_ACCESS-S2 CMCC_SPS3.5 ECCC_CANSIPsv2.1 KMA_GLOSEA6GC3.2 METFR_SYS8 NASA_GEOS-S2S-2.1

NCEP_CFSv2 PNU_CGCMv2.0 UKMO_GLOSEA6

Lead Month <input checked="" type="radio"/> 3-MON	Periods <input checked="" type="radio"/> Seasonal <input type="radio"/> Monthly	Year / Season 2023 <input type="text"/> 5 <input type="text"/>	Methods <input checked="" type="radio"/> Deterministic <input type="radio"/> Probabilistic
--	--	---	---

Models

ALL

APCC_SCOPS BOM_ACCESS-S2 CMCC_SPS3.5 CWB_TCWB1Tv1.1 ECCC_CANSIPsv2.1 KMA_GLOSEA6GC3.2 METFR_SYS8

NASA_GEOS-S2S-2.1 NCEP_CFSv2 PNU_CGCMv2.0 UKMO_GLOSEA6

Lead Month <input checked="" type="radio"/> 3-MON	Periods <input checked="" type="radio"/> Seasonal <input type="radio"/> Monthly	Year / Season 2023 <input type="text"/> 4 <input type="text"/>	Methods <input checked="" type="radio"/> Deterministic <input type="radio"/> Probabilistic
--	--	---	---

Models

ALL

APCC_SCOPS BOM_ACCESS-S2 CMCC_SPS3.5 CWB_TCWB1Tv1.1 ECCC_CANSIPsv2.1 KMA_GLOSEA6GC3.2 METFR_SYS8

NASA_GEOS-S2S-2.1 NCEP_CFSv2 UKMO_GLOSEA6

Lead Month <input checked="" type="radio"/> 3-MON	Periods <input checked="" type="radio"/> Seasonal <input type="radio"/> Monthly	Year / Season 2023 <input type="text"/> 3 <input type="text"/>	Methods <input checked="" type="radio"/> Deterministic <input type="radio"/> Probabilistic
--	--	---	---

Models

ALL

APCC_SCOPS BCC_CSM1.1M BOM_ACCESS-S2 CMCC_SPS3.5 CWB_TCWB1Tv1.1 ECCC_CANSIPsv2.1 KMA_GLOSEA6GC3.2

METFR_SYS8 NASA_GEOS-S2S-2.1 NCEP_CFSv2 PNU_CGCMv2.0 UKMO_GLOSEA6

Lead Month <input checked="" type="radio"/> 3-MON	Periods <input checked="" type="radio"/> Seasonal <input type="radio"/> Monthly	Year / Season 2023 <input type="text"/> 2 <input type="text"/>	Methods <input checked="" type="radio"/> Deterministic <input type="radio"/> Probabilistic
--	--	---	---

Models

ALL

APCC_SCOPS BOM_ACCESS-S2 CMCC_SPS3.5 CWB_TCWB1Tv1.1 ECCC_CANSIPsv2.1 KMA_GLOSEA6GC3.2 METFR_SYS8

NASA_GEOS-S2S-2.1 NCEP_CFSv2 PNU_CGCMv2.0 UKMO_GLOSEA6

4. [실습] 사용자 맞춤형 계절예측 및 검증 실습 | Prediction 서비스



| Prediction 시작하기 - 12 (파일 다운로드)

My Jobs 페이지

Prediction	2023-07-06 19:02:45	2023-07-06 19:08:52	Download	View
Prediction	2023-07-06 19:02:20	2023-07-06 19:09:58	Download	View
Prediction	2023-07-06 19:02:14	2023-07-06 19:08:17	Download	View

Request ID: 64a6912620dd750006fe8f67

Type: FORECAST
 Date: 2023-7
 Models: APCC_SCOPS, BOM_ACCESS-S2, CMCC_SPS3.5, ECCS_CANSIPsv2.1, KMA_GLOSEA6G3.2
 Method: SCM
 Variables: prec, slp, sst, t2m, t850, u200, u850, v200, v850, z500



- 3-MON_FORECAST_SCM_MME_OUT_DATA_SEASONAL_prec.nc
- 3-MON_FORECAST_SCM_MME_OUT_DATA_SEASONAL_slp.nc
- 3-MON_FORECAST_SCM_MME_OUT_DATA_SEASONAL_sst.nc
- 3-MON_FORECAST_SCM_MME_OUT_DATA_SEASONAL_t2m.nc
- 3-MON_FORECAST_SCM_MME_OUT_DATA_SEASONAL_t850.nc
- 3-MON_FORECAST_SCM_MME_OUT_DATA_SEASONAL_u200.nc
- 3-MON_FORECAST_SCM_MME_OUT_DATA_SEASONAL_u850.nc
- 3-MON_FORECAST_SCM_MME_OUT_DATA_SEASONAL_v200.nc
- 3-MON_FORECAST_SCM_MME_OUT_DATA_SEASONAL_v850.nc
- 3-MON_FORECAST_SCM_MME_OUT_DATA_SEASONAL_z500.nc
- 3-MON_FORECAST_SCM_MME_OUT_FIG_SEASONAL_prec.png
- 3-MON_FORECAST_SCM_MME_OUT_FIG_SEASONAL_slp.png
- 3-MON_FORECAST_SCM_MME_OUT_FIG_SEASONAL_sst.png
- 3-MON_FORECAST_SCM_MME_OUT_FIG_SEASONAL_t2m.png
- 3-MON_FORECAST_SCM_MME_OUT_FIG_SEASONAL_t850.png
- 3-MON_FORECAST_SCM_MME_OUT_FIG_SEASONAL_u200.png
- 3-MON_FORECAST_SCM_MME_OUT_FIG_SEASONAL_u850.png
- 3-MON_FORECAST_SCM_MME_OUT_FIG_SEASONAL_uv200.png
- 3-MON_FORECAST_SCM_MME_OUT_FIG_SEASONAL_uv850.png
- 3-MON_FORECAST_SCM_MME_OUT_FIG_SEASONAL_v200.png
- 3-MON_FORECAST_SCM_MME_OUT_FIG_SEASONAL_v850.png
- 3-MON_FORECAST_SCM_MME_OUT_FIG_SEASONAL_z500.png

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Prediction

Notice : A new user-customized APCC seasonal prediction (MME) and verification services based on platform technology has been opened as beta service (Refer to current APCC CLIK service : <https://clik.apcc21.org>). Please leave your any questions and feedbacks about the new service to APCC Help Desk.

Lead Month

3-MON

Periods

Seasonal Monthl

Models

ALL

APCC_SCOPS BOM_ACCESS-S2 CMCC_SPS3.5

NCEP_CFSv2 PNG_CMA_CCMv2.0 KMO_GL

Predict

[Download \(.png\)](#) [Download \(.nc\)](#)

이름

- 3-MON_FORECAST_SCM_MME_OUT_DATA_SEASONAL_prec.nc
- 3-MON_FORECAST_SCM_MME_OUT_DATA_SEASONAL_slp.nc
- 3-MON_FORECAST_SCM_MME_OUT_DATA_SEASONAL_sst.nc
- 3-MON_FORECAST_SCM_MME_OUT_DATA_SEASONAL_t2m.nc
- 3-MON_FORECAST_SCM_MME_OUT_DATA_SEASONAL_t850.nc
- 3-MON_FORECAST_SCM_MME_OUT_DATA_SEASONAL_u200.nc
- 3-MON_FORECAST_SCM_MME_OUT_DATA_SEASONAL_u850.nc
- 3-MON_FORECAST_SCM_MME_OUT_DATA_SEASONAL_v200.nc
- 3-MON_FORECAST_SCM_MME_OUT_DATA_SEASONAL_v850.nc
- 3-MON_FORECAST_SCM_MME_OUT_DATA_SEASONAL_z500.nc

PREC (Precipitation)

Based: 30 Jun, 2023 © APEC Climate Center

SLP (Sea Level Pressure)

Based: 30 Jun, 2023 © APEC Climate Center

SST (Sea Surface Temperature)

Based: 30 Jun, 2023 © APEC Climate Center

T2M (Temperature at 2m)

Based: 30 Jun, 2023 © APEC Climate Center

T8

Based: 30 Jun, 2023 © APEC Climate Center

UV2023

Based: 30 Jun, 2023 © APEC Climate Center

UV200 (Wind at 200hPa)

Based: 30 Jun, 2023 © APEC Climate Center

UV850 (Wind at 850hPa)

Based: 30 Jun, 2023 © APEC Climate Center

이름

- 3-MON_FORECAST_SCM_MME_OUT_FIG_SEASONAL_prec.png
- 3-MON_FORECAST_SCM_MME_OUT_FIG_SEASONAL_slp.png
- 3-MON_FORECAST_SCM_MME_OUT_FIG_SEASONAL_sst.png
- 3-MON_FORECAST_SCM_MME_OUT_FIG_SEASONAL_t2m.png
- 3-MON_FORECAST_SCM_MME_OUT_FIG_SEASONAL_t850.png
- 3-MON_FORECAST_SCM_MME_OUT_FIG_SEASONAL_u200.png
- 3-MON_FORECAST_SCM_MME_OUT_FIG_SEASONAL_u850.png
- 3-MON_FORECAST_SCM_MME_OUT_FIG_SEASONAL_uv200.png
- 3-MON_FORECAST_SCM_MME_OUT_FIG_SEASONAL_uv850.png
- 3-MON_FORECAST_SCM_MME_OUT_FIG_SEASONAL_v200.png
- 3-MON_FORECAST_SCM_MME_OUT_FIG_SEASONAL_v850.png
- 3-MON_FORECAST_SCM_MME_OUT_FIG_SEASONAL_z500.png

.nc 파일 다운로드

이미지 다운로드

4. [실습] 사용자 맞춤형 계절예측 및 검증 실습

Verification 서비스



Verification 시작하기 - 4 (조건 선택)

Lead Month: 3-MON

Year / Month: 2023 7

Skills: Success Rate ACC HSS ROC Curve

Variable: prec slp sst t2m t850 z500

Models: ALL

APCC_SCOPS BOM_ACCESS-S2 CMCC_SPS3.5 ECCC_CANSIPsv2.1 KMA_GLOSEA6GC3.2 METFR_SYS8 NASA_GEOS-S25-2.1 NCEP_CFSv2 PNU-RDA_CGCMv2.0 UKMO_GLOSEA6

Lead Month: 3-MON

Year / Month: 2023 4

Skills: Success Rate ACC HSS ROC Curve

Variable: prec slp sst t2m t850 z500

Models: ALL

APCC_SCOPS BOM_ACCESS-S2 CMCC_SPS3.5 CWB_TCWB1Tv1.1 ECCC_CANSIPsv2.1 KMA_GLOSEA6GC3.2 METFR_SYS8 NASA_GEOS-S25-2.1 NCEP_CFSv2 UKMO_GLOSEA6

Lead Month: 3-MON

Year / Month: 2023 6

Skills: Success Rate ACC HSS ROC Curve

Variable: prec slp sst t2m t850 z500

Models: ALL

APCC_SCOPS BOM_ACCESS-S2 CMCC_SPS3.5 ECCC_CANSIPsv2.1 KMA_GLOSEA6GC3.2 METFR_SYS8 NASA_GEOS-S25-2.1 NCEP_CFSv2 PNU_CGCMv2.0 UKMO_GLOSEA6

Lead Month: 3-MON

Year / Month: 2023 3

Skills: Success Rate ACC HSS ROC Curve

Variable: prec slp sst t2m t850 z500

Models: ALL

APCC_SCOPS BCC_CSM1.1M BOM_ACCESS-S2 CMCC_SPS3.5 CWB_TCWB1Tv1.1 ECCC_CANSIPsv2.1 KMA_GLOSEA5GC2 KMA_GLOSEA6GC3.2 METFR_SYS8 NASA_GEOS-S25-2.1 NCEP_CFSv2 PNU_CGCMv2.0 UKMO_GLOSEA6

Lead Month: 3-MON

Year / Month: 2023 5

Skills: Success Rate ACC HSS ROC Curve

Variable: prec slp sst t2m t850 z500

Models: ALL

APCC_SCOPS BOM_ACCESS-S2 CMCC_SPS3.5 CWB_TCWB1Tv1.1 ECCC_CANSIPsv2.1 KMA_GLOSEA6GC3.2 METFR_SYS8 NASA_GEOS-S25-2.1 NCEP_CFSv2 PNU_CGCMv2.0 UKMO_GLOSEA6

Lead Month: 3-MON

Year / Month: 2023 2

Skills: Success Rate ACC HSS ROC Curve

Variable: prec slp sst t2m t850 z500

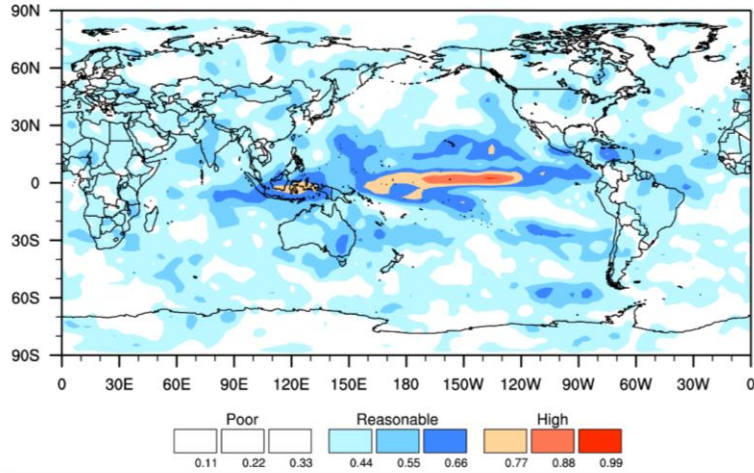
Models: ALL

APCC_SCOPS BCC_CSM1.1M BOM_ACCESS-S2 CMCC_SPS3.5 CWB_TCWB1Tv1.1 ECCC_CANSIPsv2.1 KMA_GLOSEA5GC2 KMA_GLOSEA6GC3.2 METFR_SYS8 NASA_GEOS-S25-2.1 NCEP_CFSv2 PNU_CGCMv2.0 UKMO_GLOSEA6



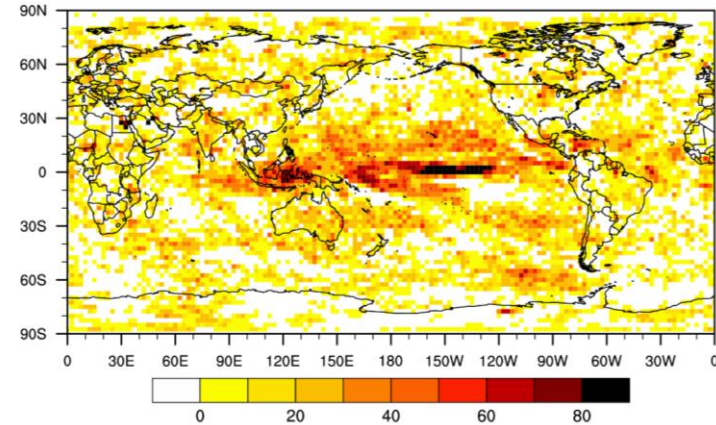
| Verification 시작하기 – Overview

Success Rate : PREC, JAS (1991-2013)



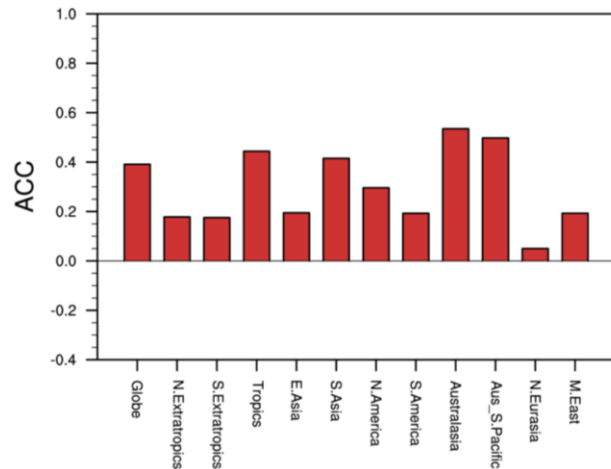
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Heidke Skill Score : PREC, JAS (1991-2013)



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Anomaly Correlation Coeff. : PREC, JAS (1991-2013)



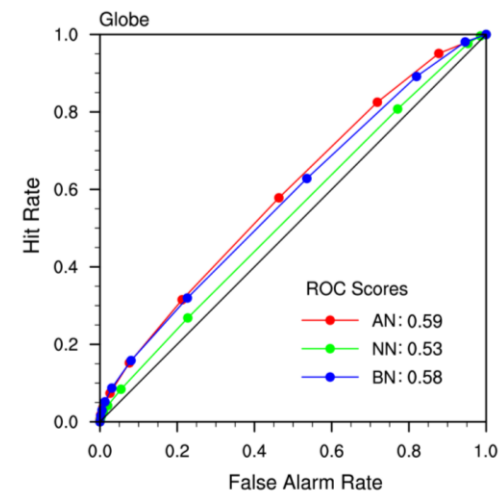
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Year/Month - 2023 / 7

Models

- APCC_SCOPS(1982~2013),
- BOM_ACCESS-S2(1981~2018),
- CMCC_SPS3.5(1991~2016)

ROC Curve : PREC, JAS (1991-2013)

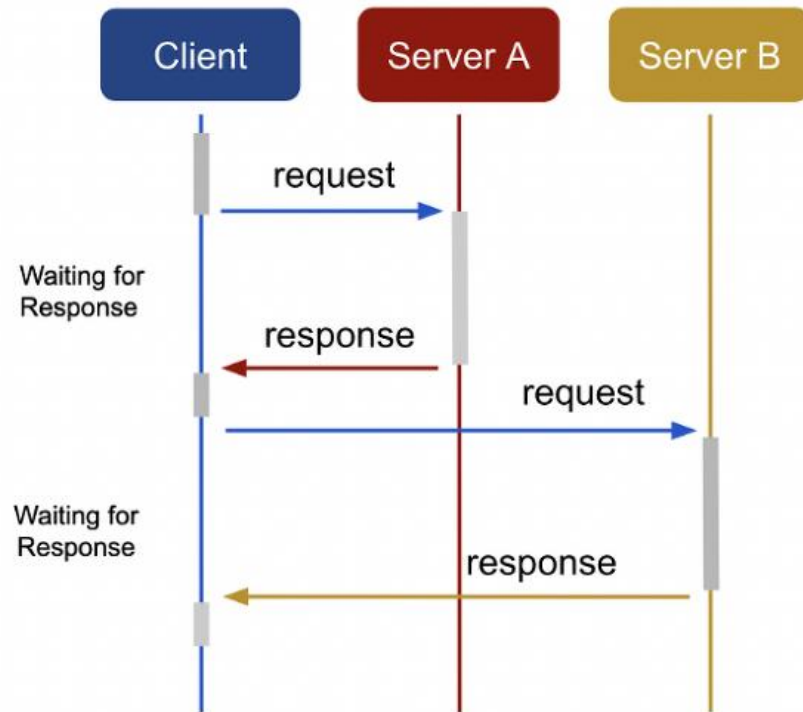


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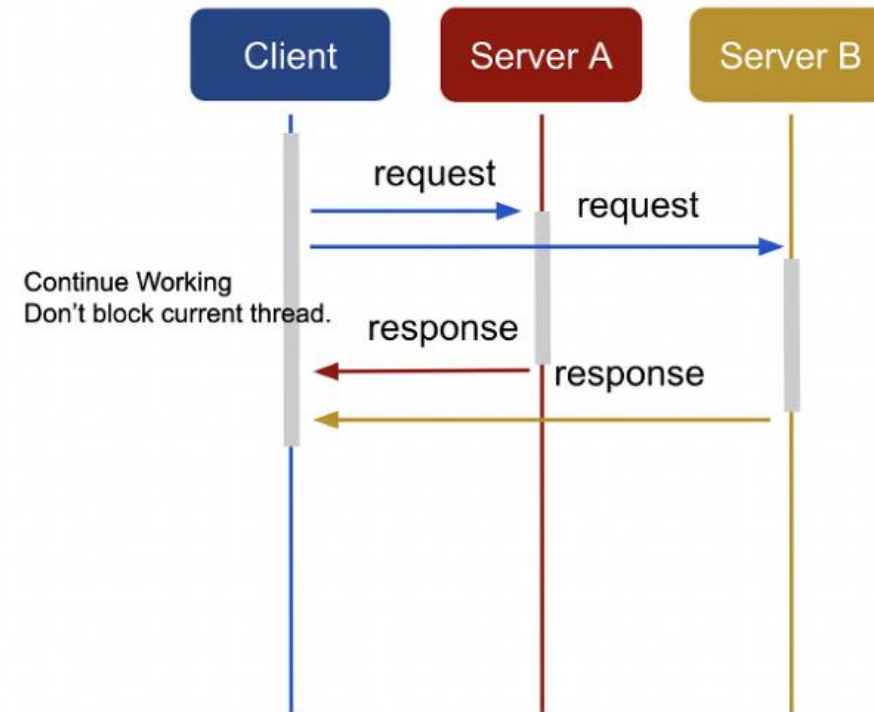


| Prediction 시작하기 - 8 (동일한 결과가 없는 경우)

Synchronous



Asynchronous



동기 (Synchronous)

- 요청과 결과가 동시에 일어나는 방식
- 요청을 보낸 후 응답을 받아야 다음 동작이 진행

비동기 (Asynchronous)

- 요청과 결과가 동시에 일어나지 않는 방식
- 사용자가 서버로 요청을 보냈을 경우 요청에 대한 응답을 기다리지 않고 다른 작업 수행 가능